

European Conference for Behavioural Biology 2026

Conference Booklet

1-4 September 2026
Anglia Ruskin University
Cambridge, UK



Contents

Welcome.....	3
Conference Contacts.....	4
Your Stay in Cambridge.....	5
Thanks and Acknowledgments.....	12
Code of Conduct.....	14
Conference Programme	24
Social events.....	25
Plenary Speakers.....	16
Conference Overview	27
Speaker Schedule.....	30
Poster Titles and Numbers.....	35
Overview of Symposia.....	38
Abstracts.....	49
Attendee List.....	277

Welcome

to the European Conference for Behavioural Biology 2026

Anglia Ruskin University, shortened to **ARU**, is honoured to host the European Conference for Behavioural Biology 2026 in Cambridge. ARU is a modern global university with students from 185 countries. We were named The Times Higher Education University of the Year 2023, achieved a Gold rating in the Teaching Excellence Framework (TEF) for outstanding student experience and outcomes, and delivered strong results in the Research Excellence Framework (REF) 2021, with 16 subject areas recognised for world-leading research.

Our story starts in 1858, when the art critic, patron and philanthropist John Ruskin opened the Cambridge School of Art. The art school grew to become Anglia Ruskin University and remains at the heart of our modern-day campus in Cambridge. As well as Cambridge, we have campuses in Chelmsford, Writtle, London, and Peterborough. We have always been **inclusive** and actively encourage students from a broad range of academic and societal backgrounds to study with us.

ARU's vibrant research community is home to a diverse range of research centres and groups. The **Centre for Ecology, Evolution and Environment** was established within the Faculty of Science and Engineering in 2025. Research in Behavioural Ecology spans a wide range of topics,

including **anthropogenic impacts on wildlife, animal communication, cognition, social behaviour, conservation, and animal welfare**.

We are delighted to welcome you to what promises to be an exciting and stimulating conference programme. Over the coming days, you will have the opportunity to hear from **six outstanding plenary speakers**, engage with a wide range of **symposia, oral presentations, and poster sessions**, and take part in a variety of **social events**. We hope you will make the most of the many opportunities to exchange ideas, establish new collaborations, and reconnect with colleagues during refreshment breaks, at the conference reception, and over dinner.

We are delighted to host you in Cambridge and hope you enjoy both the scientific programme and the city itself. Should you have any questions, concerns, or require assistance during the conference, please do not hesitate to contact a member of the organising committee, who will be happy to help.

Sincerely,
The ECBB 2026 Organising
Committee

Conference Contacts

- **Conference email:** ecbb2026@aru.ac.uk
- **Registration desk:** Lord Ashcroft Building Foyer
- **On-site organisers and volunteers:**
identifiable by conference and ARU t-shirts
- **Emergency services (UK):** 999
- **ARU Security:** via SafeZone app or 01223 417734



Your Stay in Cambridge

Our East Road campus is near the centre of Cambridge. The full address is Anglia Ruskin University, East Road, Cambridge, CB1 1PT.

Cycling

Cambridge is the unofficial cycling capital of the UK, and Cambridge Cycling Campaign has a free city map and route planner. You'll find plenty of cycle parking around the ARU campus.

Park & Ride

Cambridge runs five Park & Ride bus routes, one of which (Newmarket Road) stops at Napier Street, approximately ten minutes' walk from the East Road campus. Park & Ride is usually a quicker and cheaper option than using a car park.

Bus and coach

ARU is a 15-minute walk from Drummer Street bus station, where most local bus services stop. Stagecoach has bus timetables and route maps. National Express coaches (including services from Heathrow, Gatwick, Luton, and Stansted airports) stop at the Cambridge Coach Station on Parkside, a five-minute walk from campus. Coach routes and timetables are available from National Express.

Train

Trains run frequently between Cambridge and London, Ipswich, Peterborough, King's Lynn, Birmingham, and Stansted Airport. If you're travelling from Heathrow or Gatwick, head for King's Cross, St Pancras, or Liverpool Street stations in London; you can catch trains to Cambridge from there. If you're planning a train journey in the UK, National Rail Enquiries is a helpful source of information. If you're travelling on Eurostar, it will bring you to King's Cross, where you can catch a train to Cambridge. The journey time from London to Cambridge is about 50 minutes to one hour. When you arrive in Cambridge, the campus is a 20-minute walk from the train station. Alternatively, you can catch the busway A bus to The Busway Parkside (NW-Bound), which is a seven-minute walk to campus.

Cars and taxis

Cambridge is close to the A1 for north-south journeys, and the A14 and A47 for east-west routes. Central Cambridge can get very busy, so we recommend using the Park and Ride service if you're travelling by car. There are five different services running seven days a week. One of the services (Newmarket Road) stops at the Grafton Centre, opposite our campus.

Parking

Unfortunately, there is no parking for students, staff, or visitors on campus. However, there are a limited number of spaces for daily use by Blue Badge holders (book in advance by emailing ecbb2026@aru.ac.uk). For general parking, the Queen Anne and Grafton Street multi-story car parks are both five minutes' walk away and there is a short-stay car park opposite the campus on Adam and Eve Street. Parking a car in Cambridge can be expensive – we recommend using the Park and Ride.

Our Campus

The conference will take place in the Science Centre and Lord Ashcroft Building at Anglia Ruskin University, East Road, Cambridge, CB1 1PT. A online map of the campus is available [here](#).

Safety on Campus

To help keep our delegates safe during the conference, we encourage you to download **SafeZone** app. SafeZone is a free mobile application that provides quick and easy access to ARU's Safety & Security Team and first aid support while you are on campus. The app operates 24 hours a day and allows users to request assistance, report concerns, or contact security services directly from their phone. Further information and [download links are available via the ARU website](#).

Registration Desk

The registration desk will be located in the foyer of the **Lord Ashcroft Building** (LAB) and will be staffed throughout the conference. Delegates can collect their conference materials, obtain information about the programme

and venue, and seek assistance from members of the organising committee. Limited **luggage storage** is available, please ask at the registration desk.

Opening Hours

Tuesday 1 September	15:00-17:30
Wednesday 2 September	08:30-16:30
Thursday 3 September	08:30-16:30
Friday 4 September	08:30-10:30

If you require assistance outside these hours, please contact a member of the organising committee.

Accessibility

The ECBB 2026 Organising Committee is committed to creating an inclusive, welcoming, and accessible conference for all delegates. The conference venues, the Science Centre and Lord Ashcroft Building are fully accessible.

If you have **specific accessibility requirements** or require additional support during the conference, please contact the organisers in advance at ecbb2026@aru.ac.uk or speak to a member of the organising committee during the meeting. We will make every reasonable effort to accommodate individual needs and ensure that all delegates can participate fully in the scientific and social programme.

Accommodation

There are a great number of hotels, hostels and other accommodation options available in Cambridge. We suggest comparing prices directly and on comparison sites such as booking.com to find the best prices. Premier Inn (Cambridge East) and Travelodge (Cambridge Newmarket Road) are both within a 10-minute

walk of the ARU campus. Travelodge (Cambridge Central) is a 25-minute walk. We have provided further information about [accommodation on our conference website](#).

Sustainability

At ARU, we endeavour to employ environmentally friendly and sustainable practices as much as possible. The university strives to incorporate sustainable practices into all its activities, from student-life and research to the organisation of external events on campus. More information regarding ARU's statements and goals pertaining to sustainability may be found [here](#).

We have only made this booklet available in electronic format. Printed copies will not be available at the meetings, so please download this booklet onto your devices and refer to the e-copy.

In line with our commitment to reducing the environmental impact of the conference, catering will be exclusively vegetarian, reflecting the lower carbon footprint associated with plant-based food choices.

We thank you for your efforts and cooperation towards making ECBB2026 a sustainable and 'green' meeting.

Food and Drinks on Campus

Registration includes drinks reception and canapes on the first evening, tea/coffee breaks, and lunch (days 2 & 3). All food provided on campus for the conference is vegetarian, with vegan options available. Food will be provided in the **Science Centre** and the **Hatch area** in the Lord Ashcroft Building. If

you have any dietary requirements, or questions about the food, please do not hesitate to ask a member of the organising committee.

Water Coolers

Water coolers are available for conference delegates to **refill water bottles** throughout the event at the following locations:

Lord Ashcroft Building: Ground Floor (opposite LAB 005; opposite i-centre, next to toilet facilities)

Science Centre: Basement (opposite SCI B03); Level 0 (opposite SCI 014); and Level 1 (opposite SCI 102).

Quiet Rooms

Dedicated quiet rooms will be available throughout the conference for delegates who may wish to take a break from the conference environment, work quietly, reflect, or simply enjoy a period of calm away from the main conference activities. The quiet rooms are open to all delegates and should be used respectfully, with consideration for others who may be using the space. We kindly ask that conversations, phone calls, and other activities that may disturb others are avoided in this area. If you have any questions regarding the quiet room or require access to additional wellbeing or accessibility support, please speak to a member of the organising committee. The quiet rooms are SCI 709/710/711, and are accessible on the 7th floor of the Science Centre via the door to SCI 708.

Baby Feeding Room

A dedicated baby feeding room is available. It contains a lockable fridge, baby feeding chair, foot stool, microwave and bottle/food warmer.

Please contact a member of the organising committee for information how to access the room.

Toilet Facilities

Toilet facilities are available throughout the conference venue. Delegates can access male, female, accessible, and unisex toilet facilities at a range of locations across the building. **Accessible toilet facilities** are located at: LAB 009, LAB 023, LAB 103, LAB 122, SCI 002, SCI 312, SCI 400, SCI 534. **Unisex toilet facilities** are located at: SCI 102, SCI 201, SCI 301, SCI 501, SCI 601, SCI 701.

Additional male and female toilet facilities are available throughout the venue and are clearly signposted. If you require assistance locating the nearest facilities or have any accessibility-related questions, please speak to a member of the organising committee.

Photography and Video Recording

Photography and videography will take place throughout the conference, and these images and recordings may be used in conference communications, promotional materials, and on social media channels.

We recognise that delegates may also wish to take photographs and share these on social media. We ask that this is done respectfully and with consideration for presenters and their work. Presenters are encouraged to clearly indicate any material in their talks or posters that they **do not wish** to be photographed, recorded, or shared online. Delegates should always respect these requests.

If you do not wish to appear in photographs or video recordings taken during the conference, please make this clear to the conference organisers and to photographers. We will make every reasonable effort to accommodate such requests.

Social Media

We encourage delegates to use the following ECBB- and ARU-specific hashtags and Bluesky handles when posting or tweeting about the Meeting

#ECBB2026

Bluesky: @ecbb2026.bsky.social

Instagram: @ecbb2026

ARU Biology

Bluesky: @aru-biology.bsky.social

Wifi

Free access through "eduroam" or using the ARU Guest Wifi (requires a mobile phone number to receive an SMS code. Please talk to a member of the conference organizing committee or volunteer, if you cannot receive an SMS code in the UK).

Oral Presentations

Standard oral presentations should be a maximum of 12 minutes, followed by 2 minutes for questions.

Presentations must be uploaded in the presenters' room (LAB 005, close to the registration desk) on the morning of the presentation day, and no later than before the first plenary session.

Please name your presentation file using the format

Surname_DateOfPresentation (e.g., *Smith_02Sept2026*). **Presentations**

will be delivered from the lectern computer in the lecture room; the use of personal laptops will not be possible. If your presentation

includes videos, audio, or other media files, please ensure that they are fully embedded and compatible with the presentation system (for example, avoid formats that may not be supported). We strongly recommend checking your presentation at the time of upload to confirm that all fonts, animations, videos, and other elements display and function correctly.

Posters

Posters should be A0 and in portrait orientation. Posters will be allocated a number (in the abstract list, below). Please place your poster on the appropriate board with the matching number. Poster locations will be displayed at the registration desk. Posters can be set up any time starting on Tuesday, 1st September, 15:00. Poster attachments will be provided on the boards.

Posters should remain displayed throughout the conference.

Presenters are expected to be present at their posters during the designated poster sessions (even numbers: Wednesday, 2nd September 2026, 15:00-16:00; odd numbers: Thursday, 3rd September 2026, 15:00-16:00). Delegates are encouraged to visit the poster displays throughout the conference, particularly during lunch, coffee breaks, and other informal networking periods, but presenters do not need to attend their posters outside of their designated times.

Awards and Prizes

The closing ceremony will include an awards presentation, with prizes awarded for the best presentations and other notable achievements.

Attendance Confirmation

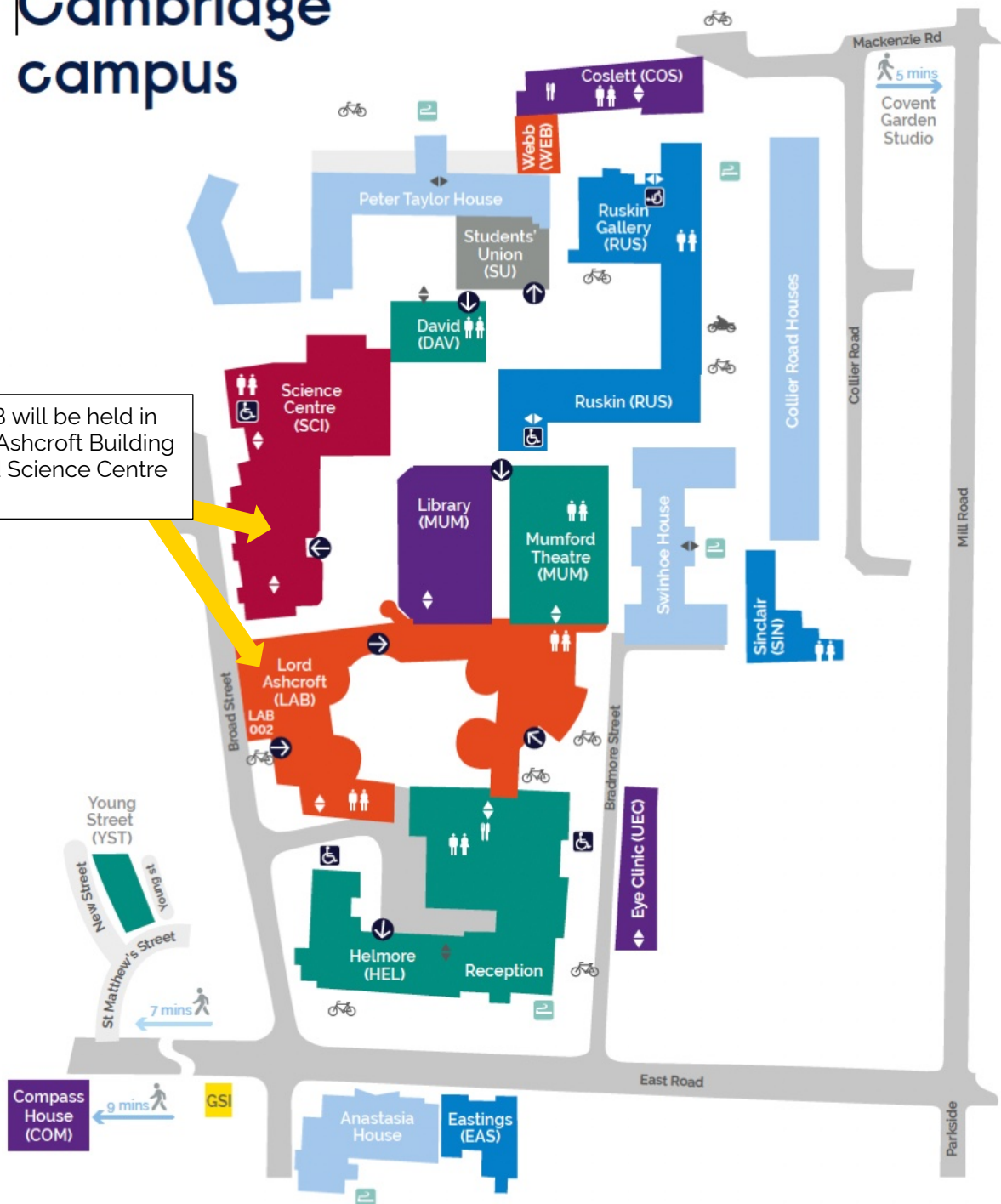
If you require a document confirming your attendance at the ECBB 2026, please contact ecbb2026@aru.ac.uk.

Cambridge city centre



Cambridge campus

The ECBB will be held in the Lord Ashcroft Building (LAB) and Science Centre (SCI)



- Student Accommodation
- Global Sustainability Institute (GSI)
- Disabled parking
- Cycle parking
- Motorcycle parking
- Toilets
- Restaurant / cafe
- Smoking area
- Lifts
- Disabled lift
- Main entrances

Thanks and Acknowledgments

Sponsors

Please see below the organisations and partners supporting ECBB 2026.



Conference Committee

The ARU Conference Organising Committee comprises

Claudia Wascher & Jacob Dunn

Co-Chairs of Organising Committee

Krishna Balasubramaniam

Programme and Co-Technical Lead

Çağlar Akçay

Sponsorship and Co-Technical Lead

Anna Nekarıs & Ariana Weldon

Communication and Social Media

Francesca Cassola

Sponsorship and Volunteer Coordination

Andrew Smith

Excursions

Roberta Blake

Social Events

Projects Team and IT Support

Megan Plumb, Nicola Riggs, Richard Field, Ben Stops, Zach Kroese, Emma Milroy

Scientific Committee

We gratefully acknowledge the members of the, a group of distinguished external experts, for their time, expertise, and dedication in reviewing submitted abstracts and helping to ensure the high scientific quality of the ECBB2026 programme.

Greg Albery

Trinity College Dublin

Jim Barnett

Trinity College Dublin

Freddy Hillemann

Durham University

José Ricardo Paula

Universidade de Lisboa

Tereza Petrusková

Charles University



Code of Conduct

As the organisational committee of the ECBB 2026, it is our fundamental mission to host an event for behavioural biology professionals to meet, connect, develop new collaborations, learn from each other, share openly scientific ideas, and build knowledge. Bringing together people from different walks of life, we wish this conference to be held in a respectful, inclusive and welcoming atmosphere.

Unfortunately, equality at scientific events remains an issue and harassment at big events, including scientific congresses, is common. Therefore, we implement a strict Code of Conduct with the aim to create a safe space where discrimination or harassment on the basis of your identity will not be tolerated. A Code of Conduct outlining expected and unacceptable behaviour, including the consequences of non-compliance, will help create an environment where delegates can interact safely, with a free and open mind. All participants, including attendees, speakers, exhibitors, volunteers, staff and service providers are expected to abide by this Code of Conduct during core conference activities (talks, poster sessions and breaks) as well as activities related to the conference (travel to and from conference, social events, excursions and shared accommodation) that are part of the ECBB 2026.

Please contact the conference organisers (ecbb2026@aru.ac.uk), conference volunteers or your session chair if you are experiencing behaviour that breaks our Code of Conduct. All reports will be kept confidential.

Expected Behaviour

In order to create a stimulating atmosphere, all attendees should keep in mind the following:

- Be respectful, supportive and considerate to everybody, including audience, presenters, staff at venue, and event organisers
- Listen when someone else tries to speak up, and be patient with people who are not very well-versed in English
- Be aware that power and status affect how others receive words and actions and how others express themselves (or feel limited in their expression)
- Do not assume anyone's gender identity, sexual preference, survivor status, economic status, background, health status
- People can have different opinions, and disagreements happen; it is okay to walk away from a conversation that is not fruitful or is becoming tense
- Refer to people by their preferred gender pronouns (as indicated on name tags)
- Get consent before posting pictures of people on social media
- Respect presenters' requests to refrain from sharing the contents of their presentations on social media or other public platforms. If presenters do not want their slides to be shared on media, we encourage them to include a logo indicating this in their presentation
- Respect the rules and policies of the event venue, hotels and any other meeting places.
- Respect presenters' requests to refrain from disseminating the contents of their presentation on social media or other public platforms. Presenters wishing to opt-out of media dissemination are encouraged to indicate their wishes by including a clear sign in their presentation

Unacceptable Behaviour

We want to create an inclusive and safe environment for everyone, and in order to achieve this, we strongly expect all attendees to refrain from the following:

- Harassment, bullying, microaggressions, intimidation and/or insinuations that are hurtful, e.g., demeaning behaviour or speech such as personal insults, sexist, racist, homophobic, transphobic, ageist or ableist language
- Inappropriate physical contact without consent and unwelcome sexual attention, including sexualized comments, jokes, advances or propositions
- Disruption during talks, poster sessions or discussions
- Verbal and/or written comments that reinforce social structures of domination related to gender, gender identity and expression, sexual orientation, disability, physical appearance, body size, race, age, religion, culture, political belief, marital or family status, social and economic class, educational level, immigration status
- Any form of physical or verbal abuse
- Advocating for or encouraging any of the above behaviour

How to Report Unacceptable Behaviour?

If you experience or observe unacceptable behaviour, please speak up and report it. You can:

- Report to any member of the organising committee on-site
- Send an email to: ecbb2026@aru.ac.uk
- If you see something that you feel is inappropriate and contrary to the spirit of the agreed-upon conduct, speak to the person affected and remind them there is a process they can access.

All reports made will be kept confidential and our team members will help to de-escalate situations.

Enforcement

Participants asked to stop any unacceptable behaviour are expected to follow the request immediately. All complaints will be reviewed and investigated and will result in a response that is deemed necessary and appropriate to the circumstances. The conference organisers retain the right to take any actions to keep the event welcoming for all participants. This includes warning the offender, expulsion from the conference, mediation with the complainant/victim of the complaint and the person alleged to have participated in harassing or discriminatory behaviour. To preserve both the safety and the confidentiality of the complainant/victim in the complaint, no specific action will be taken without consultation and approval.



Plenary Speakers

Prof Lauren Brent

*Professor of Ethology,
University of Exeter*

Friend origins and the adaptive function of social relationships

Social relationships are formed by humans and many other animals, with consequences for health, well-being, and even conservation. Socioecological theory predicts that social relationships allow individuals to cope with challenges in their environments. Yet empirical evidence for the tangible benefits that individuals obtain from their social relationships remains scarce. Progress in this area may be impeded by a lack of clear framework that aligns a given environmental challenge with its most effective social solution. The Adaptive Relationships Framework merges influential ideas from network science with classic socioecological theory to predict the types of relationships that are best suited to common environmental challenges. Here, I present this framework, use long-term data from the rhesus macaque as a case study to examine some of its predictions, and discuss the power of future cross-species comparisons and experimental studies to reveal the adaptive function of social relationships. Coming to grips with the tangible reasons why many animals need social relationships, which types they need, and how flexibly they can be adjusted to cope with increasing anthropogenic disturbance, is critical for our ability to understand, manage, and improve upon the health and survival of a large number of species, including our own.





Prof Tim Caro

*Professor
University of Bristol*

How behaviour can help us interpret coloration in mammals

In this talk I outline our understanding of the adaptive significance of coloration in mammals according to three evolutionary principles: protective coloration, communication and homeostasis. Background matching is by far the most common driver of coloration in mammals but there are instances of disruptive

coloration, perhaps dazzle coloration, and aposematism. Mammals use coloration relatively little in communication, but I will point out exceptions. Gloger's rule casts an important shadow over mammalian appearances. Exceptional cases that go beyond these principles will also be discussed. In each instance, I will suggest if and how behavioural studies could help us further unlock understanding of the evolution of coloration in this familiar taxon.

Prof Mariella Herberstein

*Head of Centre for Taxonomy & Morphology
Leibniz Institute for the Analysis of Biodiversity
Change*

The evolution of deception: ant mimicry in spiders and the power of museum collections

Mimicry is a taxonomically wide-spread phenomenon across the tree of life with ant-mimicry particularly prevalent in insects and spider lineages. Among these, spiders possibly represent the most specious cases of ant-mimicry.

While it is common to assume that mimics are very convincing representations of their models, this is not evident from various morphological studies, demanding explanations why mimics are 'not perfect'. Here I will describe several attempts to understand the evolution of mimic accuracy and the constraints and trade-offs that may limit mimic fidelity. I will finish my presentation with an ode to museum collections and how they can contribute to understanding evolutionary phenomena such as mimic.





Prof Andrew Radford

*Professor of Behavioural Ecology
University of Bristol*

Life in a noisy world

The world is full of sounds arising from a variety of sources, with this acoustic environment affecting the behaviour of animals from diverse taxa. I will begin by considering how conspecific vocalisations underpin cooperation, demonstrating that receivers can obtain multiple pieces of information from the same call, adjust their responses depending on caller identity and use acoustic cues to monitor groupmate contributions to public goods. Vocalisations

are also often a key part of the conflict that is rife in the natural world, and I will show their importance over various timeframes in both intragroup and intergroup contexts. I will then discuss how animals can profitably use sounds produced by other species but also be detrimentally affected by the noise arising from human activities. Finally, I will suggest how we might mitigate the impacts of anthropogenic noise and use sounds to help with ecosystem restoration.

Dr Bibiana Rojas

*Associate Professor
University of Veterinary Medicine, Vienna*

Living on the edge: poison frog behaviour, morphology and life history under anthropogenic stress

Animals adjust their behaviour, physiology, and morphology to survive in changing environments—but how far can they go before it is too much? Amphibians offer a powerful system to study this question: because of their permeable skin and their biphasic life cycle, amphibians are highly vulnerable to changes in their habitat, serving, in many cases, as bioindicators of ecosystem health. In this talk, I use poison frogs from a biodiversity hotspot—the Chocó region— and a high-biodiversity wilderness area in the Amazon —the Guiana Shield—to examine how anthropogenic activities impact their life-history strategies, communication systems, health and morphology. I focus on two pervasive drivers: habitat disturbance and mercury contamination. Using comparative field data and an interdisciplinary approach, I investigate the scope and direction of these impacts and evaluate their consequences at the population and community levels. I will close by discussing what these findings imply for the evolution of behaviour under rapid, human-induced environmental change, and how they can inform conservation policies in human-modified landscapes.





Dr Christopher Schell

*Assistant Professor
University of California, Berkeley*

The behaviours of ghosts: How societal legacies impact urban animal behaviour

Urban ecosystems have fundamentally reshaped our understanding of animal behaviour on a human-dominated planet. Despite the staggering pace and scale of human development and modification, urban wildlife has shown a remarkable capacity to behaviourally adjust, innovate, and cope with anthropogenic disturbance.

Accumulating evidence has repeatedly documented robust behavioural differences among urban animals and their nonurban conspecifics. However, this story remains noticeably incomplete: most work functionally dilutes developed and natural landscapes into simple binaries of “experimental” and “control”. This methodological reduction impedes our progress in understanding the very components driving behavioural divergence: people and society. Cities are spatially heterogeneous entities shaped by their cultural, economic, and demographic histories. And, importantly, legacies of societal inequity profoundly shape the ecology of cities – from vegetation cover, to microclimates, to resource availability. Hence, it is essential to incorporate a social-ecological lens to fully digest how anthropogenic disturbance induces behavioural trait variance. In his talk, Dr. Chris Schell will discuss how past and present societal inequities play a role in shaping the behavioural biology of urban wildlife. Using examples from his work and related discourses, Dr. Schell will explore how economic inequity and racial segregation dictate the ecological terms for wildlife, sometimes resulting in divergent behavioural responses within the same city. In closing, Chris will articulate how a transdisciplinary approach is critical for improving our understanding of behavioural biology as a field, while also revealing something deeper about ourselves.

Tinbergen Award of the Ethological Society Dr Ahana Aurora Fernandez

*Emmy Noether Group Leader
Institute for Neuro- and Behavioural Biology, University of
Münster*

Social learning and vocal communication in bats

Bats are highly gregarious mammals that live in a wide range of social systems, providing abundant opportunities for social learning across different contexts. Furthermore, most bat species are long-lived animals; hence, life-long learning abilities are likely to be particularly important for these animals. I will present findings based on a long-term dataset providing evidence that maternity colonies function as "information centres" that facilitate the transmission and updating of socially acquired knowledge about critical resources. Communication often plays an important role in the transmission of social information. In bats, vocal communication most likely represents one of the primary modalities mediating such information transfer. Social vocal communication in bats is also highly diverse and varies in complexity. A key factor contributing to the complexity of communication systems is vocal production learning (VPL), defined here as the ability to acquire new vocal signals through imitation. VPL is considered a key mechanism underlying the evolution of complex communication systems and is essential for human speech acquisition and language development. Despite its importance, evidence for VPL in non-human mammals remains limited. Only a small number of mammals show evidence of vocal imitation, and many of these are challenging to study, especially in the wild. In this talk, I will discuss why bats represent a promising yet underexplored taxon for studying mammalian VPL. Focusing on the greater sac-winged bat (*Saccopteryx bilineata*), I will present current findings and emerging directions on the underlying mechanisms and social factors that shape vocal development and learning.





Conference Programme



Social Events

Welcome Reception

Venue: Anglia Ruskin University, Science Centre

Date/time: Tuesday 1 September, from 18:30

Join us for the ECBB2026 Welcome Reception in the Science Centre Foyer on the evening of Day 1. The reception provides an opportunity to meet fellow delegates and reconnect with colleagues in an informal setting. Drinks and canapés are included with registration, including locally sourced English beer and wine, and a selection of soft drinks.

Conference Dinner and Ceilidh

Venue: [Homerton College](#)

Date/time: Thursday 3 September, from 18:30 - dinner served at 19:30

Tickets must be purchased in advance (with registration). Homerton College is approximately **1.5 km (20 minutes' walk)** from the Anglia Ruskin University campus. Walking is the most straightforward option, taking delegates through the city centre and along Hills Road.

Alternatively, delegates may wish to travel by taxi, which typically takes **5-10 minutes**, depending on traffic. Cambridge's frequent bus services also connect the ARU campus area with Hills Road and the Homerton College vicinity. We encourage delegates to make their way directly to the venue.

Dinner will be served at 19:30 in the **Homerton Dining Hall**, and includes a three-course meal, half-bottle of wine, elderflower cordial, bottled

water, bread rolls, and tea/coffee. All food served will be vegetarian, with vegan options available.

We will then move to a ceilidh in the Great Hall, led by the acclaimed folk band Frog on a Bike (www.frogonabike.co.uk). This traditional Gaelic social gathering will feature live music, energetic dancing, and plenty of opportunities for everyone to join in.

The Griffin Bar will be serving drinks from before dinner until 12.30am, and we will need to leave by 1am. We hope the evening will be great fun!

Early Career Researcher Pub Quiz

Venue: [Cambridge Blue](#)

Date/time: Wednesday 2 September, from 6.30pm

We are pleased to invite you to an informal and engaging **pub quiz** evening, providing a great opportunity to network, meet peers, and unwind after the first full day of the conference. Join us in one of Cambridge's well-known pubs, featuring a relaxed atmosphere, a wide range of drinks, and a chance to connect with fellow researchers in animal behaviour.

This event is particularly aimed at fostering connections among early career researchers, but all conference participants are encouraged to attend.

LGBTQIA+ meet-up

Venue: ARU campus (LAB028)

Date/time: Wednesday 2 September, 1-1.45pm

This **informal gathering** provides an opportunity to meet others,

exchange experiences, and build connections within the ECBB community in a relaxed and supportive environment. All identities and allies are very welcome.

Invisible disabilities meet-up

Venue: ARU campus (LAB028)

Date/time: Thursday 3 September, 12.45am-1.30pm

This **informal gathering** provides an opportunity to meet others, exchange experiences, and build connections within the ECBB community in a relaxed and supportive environment. All identities and allies are very welcome.

Things to do in Cambridge

Cambridge is one of the world's most renowned university cities, with a history spanning more than 800 years. Visitors may wish to explore the historic colleges, King's College Chapel, the Fitzwilliam Museum, the River Cam, and the city's many cafés, bookshops and green spaces during their stay.

For a summary of recommendations, including 'spaces to recharge', recommended pubs, zoos and wildlife, museums, please see our conference webpage:

<https://www.aru.ac.uk/events/conferences/ecbb-2026/staying-in-cambridge>

ECBB 2026

European Conference for Behavioural Biology
Animal Behaviour in the Anthropocene

1–4 September 2026
Anglia Ruskin University, Cambridge

Full Programme & Speaker Schedule



Session names in this overview - shown in [blue underline](#) - link to the detailed talk schedule

Day 1 · Tuesday 1 September 2026

15:00 – 17:15	Welcome & registration (LAB Foyer)
17:15 – 17:30	Conference opening (SCI 105) <i>Roderick Watkins (Vice-Chancellor), Jacob Dunn & Claudia Wascher</i>
17:30 – 18:30	Opening plenary: Andy Radford (SCI 105) <i>Life in a noisy world</i>
18:30 onwards	Drinks reception (SCI Atrium)

Day 2 · Wednesday 2 September 2026

8:30 – 8:50	Registration (LAB Foyer)
8:50 – 9:00	Announcements (SCI 105)
9:00 – 10:00	Plenary: Lauren Brent (SCI 105) <i>Friend origins and the adaptive function of social relationships</i>
10:00 – 10:30	Morning coffee/tea
10:30 – 12:30	<u>Parallel symposia</u> Symposium 1: Methods to study curiosity-like behaviours in animals (SCI 105) Symposium 2: Sensory landscapes in the Anthropocene: How human activity reshapes animal information use (LAB 002) Symposium 3: Practical and theoretical challenges in reptile and amphibian cognition: bridging methods, ecology and innovation (LAB 003) Symposium 4: Fish behaviour in a changing world - Part 1 (LAB 026)
12:30 – 14:00	Lunch break
13:00 – 13:45	Meet the editor of <i>Animal Behaviour</i> - Andy Radford (SCI 105)
13:00 – 13:45	LGBTQIA+ meet-up (LAB 028)
14:00 – 15:00	Plenary: Christopher Schell (SCI 105) <i>The behaviours of ghosts: How societal legacies impact urban animal behaviour</i>
15:00 – 16:00	Poster session 1 with afternoon coffee/tea

16:00 – 18:15	Parallel sessions Sociality & group living – Part 1 (SCI 105) Communication & cognition – Part 1 (LAB 026) Anthropogenic effects on behaviour (LAB 002) Mating, mating systems & reproduction (LAB 003)
19:00 onwards	<i>Pub Quiz in the Cambridge Blue</i>

Day 3 · Thursday 3 September 2026

8:30 – 8:50	<i>Administration desks open (LAB Foyer)</i>
8:50 – 9:00	<i>Announcements (SCI 105)</i>
9:00 – 10:00	Plenary: Tim Caro (SCI 105) <i>How behaviour can help us interpret coloration in mammals</i>
10:00 – 10:30	<i>Morning coffee/tea</i>
10:30 – 12:15	Parallel symposia Symposium 5: Social transfers and socially transferred materials in a changing world (SCI 105) Symposium 6: From minds to populations: functional links in coexistence in the Anthropocene (LAB 026) Symposium 7: Leveraging new bioacoustics advances for behaviour-informed conservation (LAB 002) Symposium 8: In the spotlight: impacts of artificial light at night on invertebrate behaviour (LAB 003)
12:15 – 13:30	<i>Lunch break</i>
12:45 – 13:30	<i>Invisible disabilities meet-up (LAB 028)</i>
13:30 – 14:30	Plenary: Mariella Herberstein (SCI 105) <i>The evolution of deception: ant mimicry in spiders and the power of museum collections</i>
14:30 – 15:30	Poster session 2 with afternoon coffee/tea
15:30 – 17:45	Parallel sessions Sociality & group living – Part 2 - and other topics (SCI 105) Communication & cognition – Part 2 (LAB 026) Movement, foraging & ranging (LAB 002) Health, welfare & fitness (LAB 003)
18:30 onwards	Conference dinner (Homerton College) <i>Arrivals from 18:30 · dinner served 19:30 · ceilidh to follow</i>

Day 4 · Friday 4 September 2026

8:30 – 9:00	<i>Administration desks open (LAB Foyer)</i>
8:50 – 9:00	<i>Announcements (SCI 105)</i>

9:00 – 10:00	Plenary: Bibiana Rojas (SCI 105) <i>Living on the edge: poison frog behaviour, morphology and life history under anthropogenic stress</i>
10:00 – 10:30	<i>Morning coffee/tea</i>
10:30 – 12:30	<u>Parallel symposia</u> Symposium 9: Fish behaviour in a changing world - Part 2 (SCI 105) Symposium 10: Social cognition in a human world (LAB 002) Symposium 11: Primates in the Anthropocene: the ecology of adaptive behavioural responses (LAB 026) Symposium 12: Pre- and post-copulatory sexual selection under thermal stress (LAB 003)
12:30 – 13:00	Tinbergen Prize Plenary: Ahana Aurora Fernandez (SCI 105) Social learning and vocal communication in bats
13:00 – 13:30	Closing remarks & awards (SCI 105)
13:30 onwards	Excursions <i>Starting at 15:00</i>

Talk titles - shown in [blue underline](#) - link to their abstracts

Day 2 · Wednesday 2 September 2026 — Symposia (10:30–12:30)

Time	Symposium 1: Methods to study curiosity-like behaviours in animals LAB026 Chairs: Tiago Monteiro & Victor Ajuwon	Symposium 2: Sensory landscapes in the Anthropocene: How human activity reshapes animal information use SCI105 Chairs: Francisco Ruiz-Raya & Arianna Passarotto	Symposium 3: Practical and theoretical challenges in reptile and amphibian cognition: bridging methods, ecology and innovation LAB002 Chairs: Francesca Cassola & Anna Wilkinson	Symposium 4: Fish behaviour in a changing world — Part 1 LAB003 Chairs: Joachim Frommen, Adam Reddon & Will Swaney
10:30–11:00	Sofia Forss · keynote What can we learn from studying curiosity in animals? Insights from primatology	Ulrika Candolin · keynote Behavioural responses to artificial-light-at-night: ecological and evolutionary consequences	Birgit Szabo · keynote Beyond borrowed methods: how can we improve the study of lizard cognition?	Christos Ioannou · keynote Shoaling and predation in turbid waters
11:00–11:15	Rachael Miller A large-scale study across the avian clade identifies ecological drivers of neophobia	Matteo Guidotti Does electrosnog affect the orientation behaviour and migratory restlessness of caged wild migratory songbirds?	Stephan A. Reber · keynote Crocodilian cognition - utilising the last ectothermic archosaurs to understand the origins of the avian mind	Fletcher Noble Anemonefish prioritise mutualistic partner over social group during marine heatwave
11:15–11:30	Victor Ajuwon Flexible instrumental information-seeking in a corvid	Cristina Romero Diaz Molecular mechanisms of sensory compensation to environmental change		Daisy Cooper Behavioural impacts of reductions in group size in a social fish
11:30–11:45	Megan Lambert · keynote Animal curiosity: context, causes and consequences	Nora Carlson Effects of noise on Pacific sand lance <i>Ammodytes personatus</i> with implications for their avian predators	Anna Wilkinson Do reptiles know what another reptile can see?	Tsz Hin Lo Personality and cognition: the dynamic duo in biological invasions
11:45–12:00		Maeve Hoogland Good intentions, bad cues: environmental cues influencing nest box selection in blue and great tits	Francesca Cassola Local wildlife management systems as opportunities for reptile behavioural research	Nick Jones Warming and decision-making in fish: how increasing temperature shapes behavioural responses and the cognitive consequences
12:00–12:15	Daniel Rivas-Blanco Capitalizing on novelty: how wolves and dogs interact with human-created objects	Robyn Grant Vibrissal sensory landscapes in Pinnipeds in the Anthropocene	Panel Discussion	Elia Gatto Light pollution, global warming, and their interaction: effects on fish behaviour
12:15–12:30	Vildan Acar Rethinking how we measure cognition in the wild: insights from an experiment in wild bird	Khawla Bouali Anthropogenic disturbance predicts shorter flight initiation distances but is not associated with short-term habituation or sensitisation		Danielle M Crowley The effects of artificial light on the swimming capacity of migratory three-spined sticklebacks

Day 2 · Wednesday 2 September 2026 — Parallel sessions (16:00–18:15)

Time	Sociality & group living 1 LAB026 Chair: Lisandrina Mari	Communication & cognition 1 SCI105 Chair: Sara Torres Ortiz	Anthropogenic effects LAB002 Chair: Ulrika Candolin	Mating & Reproduction LAB003 Chair: TBC
16:00–16:15	Adam Reddon Submission signalling in a cooperatively breeding cichlid fish	Tamal Roy Fisheries-like selection causes evolutionary changes in the brain and cognitive abilities in a zebrafish harvest-selection model	Blake Morton Time in the city: long-term urban exposure predicts greater exploration and problem-solving in wild red foxes	Wolfgang Goymann Arthropod availability shapes reproductive trade-offs and apparent survival in a declining grassland bird
16:15–16:30	Zachary Cloutier The sound of fear: mapping perceived predation risk from wild meerkat's alarm calls	Zijie Zeng Flexible, abstract rhythm perception in bumblebees	Selvino de Kort Does aircraft noise cause hearing impairment in birds?	Melissa Vanderheyden Birth synchrony among kin in free-ranging domestic dogs
16:30–16:45	William Swaney Turn to the dark side: light avoidance in zebrafish varies with age and social context	Jennifer A. Colbourne The potential effect of islands on the innovative abilities of corella cockatoos	Margaret Hughes Between fire and fragmentation: interacting disturbances shape boreal caribou movement and predator-prey spatial overlap	Mark Dyble Human monogamy in mammalian context
16:45–17:00	Sandra Trigo Glucocorticoids shape social networks in a gregarious bird	Joachim Frommen Multi-modal communication during agonistic encounters in a highly social fish species	Agnes Francila F The cost of city living: increased female care but reduced reproductive success in urban house sparrows	Vittorio Ferrero Chronic anthropogenic noise degrades acoustic behaviour and reproductive fitness in the two-spotted cricket
17:00–17:15	Alvaro López Caicoya Pigs open doors for conspecifics: a multi-site evaluation of pro-social behaviour	Çağlar Akçay Urban chaffinches are less flexible in territorial aggression than rural chaffinches.	Sarah Marshall-Pescini Wolves responses to novelty, human- and dog-like cues. Does living closer to people matter?	Alice Hill Determinants of male reproductive success in polygynandrous wild Assamese macaques
17:15–17:30	Océane Bégassat How colony organization shapes spatial segregation in a marsh tern, the Whiskered tern (<i>Chlidonias hybrida</i>)	Willa Lane Out of sight, not out of mind: object permanence, camouflage, and information-seeking behaviour in cuttlefish	Tapinder Sidhu Can we read elephants? Recognising elephant postural signals of aggression and evasion in human-elephant interactions	Tanisha Henry Consequences of mismanagement: government cull of sheep river's bighorn rams shifts demography and phenotypic expression
17:30–17:45	Maria Maclaren From dusk till dawn: light-driven changes in aggressive communication are sex-based in a group-living cichlid	Tomasz S. Osiejuk The frequency of birdsong and its importance in territory defense among pigeons and songbirds	Tuhin Subhra Pal Mirrors in the urban matrix: reflective encounters reveal context-dependent social cognition in free-Range use dogs	Ana Cristina Gomes Climate-change driven bird-insect phenological mismatch in a migratory passerine
17:45–18:00	Coral Chell Social Behaviour of the Critically Endangered <i>Propithecus coquereli</i> in a human-modified landscape, northwestern Madagascar	Tamás Faragó Valence or motivation, that is the question - acoustic correlates of emotional and motivational state in dog vocalisations	Léa Lorrain-Soligon Addicted to pollution? Caffeine drives attraction and altered locomotor performance in a freshwater fish	Daria Siewierska Courtship or confrontation? The dual impact of male USVs on female vole behaviour
18:00–18:15	Aesha Lahiri Affiliative postures of unfamiliar humans influence approach decisions in free-Range use dogs	Michelle Spierings Short-range dialect formation in an invasive wild parrot	Julia Mackenzie Neophobia in urban and rural blue tits	Eva Millesi Oestrus phase matters: changes in social behaviour and stress responses in female guinea pigs during the ovarian cycle

Day 3 · Thursday 3 September 2026 — Symposia (10:30–12:15)

Time	Symposium 5: Social transfers and socially transferred materials in a changing world LAB026 Chairs: Adria LeBoeuf & Arthur Matte	Symposium 6: From minds to populations: functional links in coexistence in the Anthropocene SCI105 Chair: Nishant Kumar	Symposium 7: Leveraging new bioacoustics advances for behaviour-informed conservation LAB002 Chair: Sara Torres Ortiz	Symposium 8: In the spotlight: impacts of artificial light at night on invertebrate behaviour LAB003 Chairs: Emmanuelle Briolat & James Galloway
10:30–11:00	Elva Robinson · keynote What drives the evolution of socially transferred materials?	Aldina M A Franco · keynote Mechanisms underlying recent changes in foraging and movement behaviour of a long lived species	Angela Dassow · keynote Applications of real-time AI for conservation and human-wildlife coexistence	Dan-Eric Nilsson · keynote Multiple roles of photoreception cause multiple threats to animal life on earth
11:00–11:15	Adria LeBoeuf Inverse lactation: larval secretions control reproductive division of labour in ants	Sofia Forss Cognitive exaptation to anthropogenic environments	Hannah Gower Are all snaps equal? Characterising species-specific acoustic behaviour in coral reef snapping shrimp	Gregory Eckhardt Streetlights may decrease predation of ground-based insects
11:15–11:30	Kat Bebbington Social transfer of immunity under varying environmental conditions in speckled mousebirds	Sophie Ridgway Social effects on neophobia in red-billed chough	Jonny Magnay Evaluating soundscape enrichment as a tool for European flat oyster (Ostrea edulis) restoration	Jiaqing Cai Artificial light at night alters earthworm behaviour and soil processes
11:30–12:00	Arthur Matte · keynote When behaviours share physiology: socially transferred materials as channels for evolutionary innovations	Christian Rutz · keynote Using animal-tracking data to investigate human-wildlife interactions and promote sustainable coexistence	Arik Kershenbaum · keynote How to use real-time AI for field bioacoustics. Leveraging edge computing when power consumption and data bandwidth are limiting	Bridgette Farnworth · keynote Discovering the domino effect: how artificial light's impact on individual behaviour can drive ecosystem change
12:00–12:15	Francisco Ruiz-Raya Maternally determined egg differences shape embryonic responsiveness to environmental cues and survival in gull siblings	Nishant Kumar Rapid environmental change disrupts cue-outcome mappings, constraining animal behaviour in the Anthropocene	Panel Discussion	Amine Kousba Insect behavior along an urban gradient: how do insects respond to artificial light throughout the lunar cycle?

Day 3 · Thursday 3 September 2026 — Parallel sessions (15:30–17:45)

Time	Sociality & group living 2 LAB026 Chair: Marc Naguib	Communication & cognition 2 SCI105 Chair: Sue Anne Zollinger	Movement, foraging & ranging LAB002 Chair: Eduardo Bessa	Health, welfare & fitness LAB003 Chair: Nora Carlson
15:30–15:45	Amy Morris-Drake Meerkat markets: how variation in sentinel demand influences cooperative trades	Grant Doering The evolutionary origin of group recruitment in acorn ants	Stanley Edwards Personality differences in locomotory behaviour are locally adapted to edge and core habitats in a wild ground beetle	Giulia Severino The role of personality in welfare: how individual differences in personality influence welfare variations and response to environmental enrichment in captive <i>Sapajus apella</i>
15:45–16:00	Luca G. Hahn Social information use during nest construction in a wild corvid and its implications for animal culture	Anna Elisa Kempf Tooling in the tree tops: arboreality may facilitate tool use innovations on unfixed targets in Goffin's cockatoos (<i>Cacatua goffiniana</i>)	Charlotte Christensen Foraging through thick and thin: does behavioural flexibility under resource scarcity come at a cost?	Manuel Sapage Two-way relationship between gut microbiota and social behaviour in the Siamese fighting fish
16:00–16:15	Thomas Bugnyar Give me a ride? Large between-individual but consistent within-individual variation in ravens' use of wild boars	Ailis Wynne Ontogenetic changes in colour and body size shift a non-toxic poison frog from cryptic to conspicuously mimetic	Anna Pilská Early response to wolf return: biollogger-based study of red deer behaviour in the presence of grey wolves	Mélissa Peignier Sensory processing sensitivity shapes environmental perception and behaviour in horses
16:15–16:30	William O'Hearn Network cognition in a group-living primate: discrimination between distant third-party friendly relationships	Katherine Todd Vibrissal sensory discrimination training in South African fur seals (<i>Arctocephalus pusillus pusillus</i>)	Robert Boddington The role of individual behaviour across timescales in shaping collective responses	Marco Graziano Microbe, mates and contact: insights from guppies (<i>Poecilia reticulata</i>)
16:30–16:45	Diogo L Pires Macaque social network structure beyond rank assortativity	Ben Secker Going tit-à-tit: what do blue tit responses to willow tit song tell us about nest-site competition?	Arik Dorfman Lunar cycle-driven exploration-exploitation dynamics in wild gerbils	Miguel Silva Elevated testosterone increases impulsivity in a social bird
16:45–17:00	Marc Naguib Social organisation of zebra finches in the wild - tracking long term family movement	Doli Borah Coordination and communication of cooperative offspring care behaviour (babysitting) in meerkats	Friederike Hillemann Linking weather to foraging decisions: a going-out model	Krishna Balasubramaniam Kinship effects on gut microbiomes among wild meerkats (<i>Suricata suricatta</i>) in the Kalahari
17:00–17:15	S Anvitha The influence of drought on survival, reproduction, social structure, and body condition of Asian elephants	Kai Amino Deep learning reveals ultraviolet-dependent shifts in mimicry under predation	Lia Schlippe Justicia Habitat selection in an Amazonian poison frog is consistent despite anthropogenic disturbance and phenotypic variability	Louise Tovey Monkey business: exploring the stress response of Barbary macaques (<i>Macaca sylvanus</i>) to tourism in Gibraltar
17:15–17:30	Vojtěch Kasič Friends, foes, or indifferent? Vigilance suggests neutral coexistence of chamois and red deer	Friederike Range Talking to team up: communicative precision in wolf vs. dog cooperation	Ciaran Harris Causes and consequences of individual differences in personality traits between edge and core habitats in a woodland specialist ground beetle	Robin Morrison The impact of parental loss on gorilla survival and sociality
17:30–17:45	Thurston Cleveland Hicks Charting a new chimpanzee behavioral realm from Chinko. The Central African Republic	Lucinda Mellish Cognitive attention bias as a measure of wild bird welfare	Lynn Robey Sex-based dietary niche partitioning in island endemic birds of São Tomé and Príncipe	Sabine Tebbich Overfed and overstressed? Nutritional state affects stress coping and behavioural flexibility in rainbow trout

Day 4 · Friday 4 September 2026 — Symposia (10:30–12:30)

Time	Symposium 9: Fish behaviour in a changing world — Part 2 LAB026 Chairs: Joachim Frommen, Adam Reddon & Will Swaney	Symposium 10: Social cognition in a human world SCI105 Chairs: Elias Garcia-Pelegriin & Alizee Vernouillet	Symposium 11: Primates in the Anthropocene: the ecology of adaptive behavioural responses LAB002 Chair: Adrian Barnett	Symposium 12: Pre- and post-copulatory sexual selection under thermal stress LAB003 Chairs: Karendeep Sidhu & Berta Canal Domenech
10:30–11:00	Erin McCallum · keynote Impacts of pharmaceutical pollutants on fish behaviour in complex social and spatial environments	Lisandrina Mari · keynote Forever chemicals, forever effects? Exploring the impacts of pre-natal PFAS exposure on social behavior in waterfowl	Bruna Bezzer · keynote Shaping the future: effective public policies and primate survival in the Anthropocene	Liam Dougherty · keynote Is sperm the weak link in stress tolerance? Sex differences in the thermal sensitivity of reproduction
11:00–11:15	Eduardo Bessa Underwater soundscape effect on fish behaviour depends on their ability to perceive and produce sounds	Daphne Cortese Effects of temperature, social context and metabolic rate on learning in a social freshwater fish	Adrian Barnett Primate social structure drivers across climatic gradients: Trans-Amazonian model for potential climate change impacts	Anita Curti Heatwaves have sex-specific effects on the reproduction of the nuptial feeding spider
11:15–11:30	Mar Pineda Fishing for answers: behavioural drivers of capture in Amazonian fish	Camille Troisi The effect of an urban diet on spatial navigation and collective behaviour of groups of feral pigeons	Dietmar Zinner Smart monkeys, wasteful humans: lessons from urbanisation on baboons in Saudi Arabia	Yasmin Naz Akyürek Heatwaves make males hotter: increased mating success after heat stress in a subtropical field cricket population
11:30–11:45	Ryo Futamura Overfishing due to fish learning: impacts of catch-and-release angling on behavior towards lures in two freshwater predators in the wild	Fay Clark · keynote Socially situated physical cognition: theoretical and methodological reasons to test skills within groups	Julian A. Chhatralia Chimpanzee movement and ranging responses to recurrent wildfire in the Issa Valley, Tanzania	Chiara Morosinotto · keynote Heatwaves on reproduction and sexual selection: cryptic and transgenerational effects
11:45–12:00	João Almeida Marine heatwaves and hypoxia disrupt escape responses without affecting group structure in early stages of <i>Atherina presbyter</i>		Stephanie Mercier Anthropogenic exposure influence participation and food consumption in vervet monkeys	
12:00–12:15	Helena Norman The effects of sleep disruption and temperature on shoaling cohesion in the Trinidadian guppy (<i>Paracheirodon axelrodi</i>)	Urša Blenkuš Free-ranging dogs with higher human-directed sociability show greater success in communication with humans	Anna Nekaris Advances in studying the behaviour of a critically endangered primate in a complex agroforestry mosaic landscape in Indonesia	Malay Pandey Heatwaves do not alter exploration and aggressive behavior during agonistic interactions among male field crickets <i>Gryllus bimaculatus</i>
12:15–12:30	Amelia Munson Too hot to school: influence of elevated temperature on social behaviour in fish	Vitor H. B. Ferreira Humans as social partners? Experience and selection history shape responses in domestic chickens	Sylvain Lemoine Behavioural traditions and adaptations to an anthropogenic landscape in the Gibraltar Barbary macaques (<i>Macaca sylvanus</i>)	India Sutherland Thermal sensitivity of survival, but not reproduction, depends on adult age in male <i>Drosophila melanogaster</i>

Poster Titles and Numbers

Presenting author	Title	Number
Ash	Behavioural responses of grey squirrels (<i>Sciurus carolinensis</i>) to volatile organic compounds produced by Populus trees	1
Richardson	Human disturbance in a butterfly house: a Bayesian approach	2
Dudine	Behavioural consequences of heatwaves: moving towards a multi-stressor framework	3
Berger	Microhabitat selection in fire salamanders (<i>Salamandra salamandra</i>) from core and managed forest areas in the Vienna Woods	4
Liu	Play with aspects: disentangling how kinematic, social, and spatial play shape physiology, sociality, and cognition	5
Emerick	Blinded by the light: investigating human influences on migratory birds from a continent-wide acoustic tracking system	6
Bygrove	Eavesdropping on migration: insights from a continent-wide acoustic monitoring network	7
Galloway	The effects of headlight emissions on noctuid moth dark adaptation	8
St John Wallis	Conceptualising subtypes of animal flexibility and why they matter	9
Yousry	Colour morph dependent hunting strategies in West Atlantic trumpetfish (<i>Aulostomus maculatus</i>)	10
Cabrera Vasquez	Socio-cognitive development of pigs in diverging housing conditions	11
Ferrero	Chronic anthropogenic noise degrades acoustic behaviour and reproductive fitness in the two-spotted cricket	12
Wilson	Behaviour-integrated dead-reckoning: hyper-detailed biologging on wild impala	13
Osotsi	Social communication during a sow-piglet foraging paradigm	14
Pinkney	Is climate change amplifying the effects of artificial light at night (ALAN) on hermit crab personality?	15
Bruchmann	Measuring relaxation during grooming in Barbary macaques using contact-free infrared thermography	16
Preston	Domestic dog disturbance of Ethiopian wolves in a protected Afroalpine habitat	17
Pietrala	"Smoking habits" of great tits? Cigarette butts in nests as a possible adaptive behaviour - preliminary results	18
Gleske	Hormonal and behavioural phenotypes in juvenile male guinea pigs living in distinct social environments	19
O'Leary	Using passive acoustics to assess the effects of land-use on bird and bat species composition in the Carolinian zone	20
Zollinger	What does the tapir say? Vocal behaviour in captive South American tapirs, <i>Tapirus terrestris</i>	21
Lin	Enhancing canine welfare in the Anthropocene: the impact of environmental enrichment on stress and social interactions in urban pet parks	22
Bognár	Evaluating the cephalic index as a measure of head shape variation in dogs using geometric morphometric methods	23
Sini	Social influences on feeding behaviour: evidence for eating facilitation in <i>Macaca fascicularis</i>	24
Tóth	Individual predictors of dogs' barking and howling behaviour	25
Matthew	Admixture effects on thermal performance traits in the invasive common wall lizard	26
Grabner	Spontaneous sound localisation behaviour in freely moving common marmosets (<i>Callithrix jacchus</i>)	27
Talyigas	Challenges in posed-based behaviour recognition in chimpanzees	28
Bapat	Ravens (<i>Corvus corax</i>) use objects to mediate social interactions with others	29
Danthony	The function of multimodal courtship in king penguins	30
Sen	Thinking like an elephant: incorporating elephant behaviour into human-elephant conflict mitigation	31
Miller	Snapping under pressure: the role of anthropogenic noise in fish stress on marine protected areas	32

Goddard	Understanding chimpanzee (<i>Pan troglodytes</i>) facial and behavioural expression of emotion, personality and wellbeing	33
Ma	Song complexity and cognitive ability are not consistently related in the pied flycatcher (<i>Ficedula hypoleuca</i>)	34
Andrews	How does the invasive Asian common toad impair the native amphibian fauna of Madagascar	35
Surette	Loudness and landscape: habitat-dependent variation in avian song amplitudes	36
Stockley	Maternal phenotype mediates adaptive changes in offspring behaviour under social competition	37
Willcox	Birds of a feather stick together: early-life social experiences shape chicken social networks during integration	38
Kern	Chorus synchrony as a cue: wolves' response to unfamiliar pack howls	39
Kalousek	Ravens lead - wolves feed?	40
Gygax	Temporal aspects of short-term, intermediate and long-term affective states in non-human animals: assumptions and evidence	41
Ramires	The nocturnal effect of human presence on the biological time of captive badgers	42
Jolivald	Development and validation of a qualitative behaviour assessment tool for zoo-housed meerkats (<i>Suricata suricatta</i>)	43
Faria	Hybrid behavioural monitoring in captive Iberian lynx using BORIS and DeepLabCut	44
Sibaux	The occurrence and use of polarization signals in the common cuttlefish <i>Sepia officinalis</i>	45
Torres Ortiz	Otters prepare for mutually exclusive outcomes: a new model for comparative cognition	46
Maiolini	Rhythmic choices: investigating temporal preferences in zebra finches	47
Chandrashekar	Horns and harvests: understanding gaur (<i>Bos gaurus</i>) behaviour in the human-dominated landscape of South India	48
Barou-Dagues	Bycatch-induced evolution of behaviour appears unlikely in a wild sea bird population	49
Gilford	A transcriptional timeline of stress and recovery in the cricket <i>Gryllus bimaculatus</i>	50
Baig	Mammals favour structure, flee extraction: evidence from Kumaon Himalaya, India	51
Zonnebeld	People and long-tailed macaques in agricultural landscapes: investigating the human-macaque interface on Simeulue	52
Rocha	Singing back: how island territoriality shapes female song in <i>Fringilla</i>	53
Brownell	Maternal and environmental effects on infant spatial development in wild chacma baboons	54
Berweiler	Has domestication eroded cooperation in dogs?	55
Hiraki	Evaluating the habituation of introduced raccoon dogs to humans using flight initiation distance	56
Leonardi	The position and role of weak links in rhesus macaque social networks	57
Kivelä	Smart control of public lighting as a tool to mitigate the impacts of artificial light at night on insects	58
Roskam	Does colour matter? Multi-stage predator responses to aposematic prey across urban and rural landscapes	59
Channer	Humans as indirect facilitators of a mammal-mammal cleaning symbiosis	60
Bordes	Social factors do not influence helping behaviour in pigs	61
Schiller	Personality and prosocial helping behaviour in pigs	62
Hodgson	Effect of veterinary teaching procedures on dairy cattle behaviour	63
Greenway	Crossing boundaries: inbreeding avoidance increases hybridisation in mixed species settings	64
Tomašić	Do dogs infer human attentional focus from shared experience? Evidence from mobile eye-tracking	65
Doyen	Context-dependent benefits of extra-pair mating under fluctuating environmental conditions in house sparrows (<i>Passer domesticus</i>)	66
Tarongo	Effect of water restriction on early courtship in a monogamous songbird	67
Layton	The impact of anthropogenic noise on the howling behaviour of mantled howler monkeys (<i>Alouatta palliata</i>)	68

Thakur	Determinants of social wound care in <i>Diacamma indicum</i>: the influence of injury site, severity, and caste on survival	69
Bohr Brask	OKAAPI - a new approach for understanding animal social structures	70
Acharjee	Where is my nest: impact of pesticide on the memory of a tandem-running ant <i>Diacamma indicum</i>	71
Amichaud	Cows observe our behaviour and may even form reputations of humans	72
Jowett	The impact of visitor presence on behavioural response in a large cat cafe	73
Faure	Is avoidance of human-dominated landscapes in juvenile golden eagles a signature of past human-animal relations?	74
Furik	Deciphering dog neural correlates of emotional valence and social motivation in conspecific vocalisations	75
Turcsán	Perceived support without measurable benefits - pets and well-being during COVID-19	76
Jao	Human-macaque encounters in a tourist landscape: conflict salience, photography, and public engagement with Gibraltar's Barbary macaques	77
Rose-Møller	Comparative anatomy of the larynx in bats, rodents and ungulates	78
McKissack	Flexibility in diel activity: the differential effects of domestic and tourist disturbance on the temporal patterns of spotted hyenas (<i>Crocuta crocuta</i>)	79
Yang-Fu	Using touchscreens to study dogs' learning and memory of artificial sensory information	80
Das	The role of food-based enrichment on behaviour and welfare in captive clouded leopards (<i>Neofelis nebulosa</i>) and fishing cats (<i>Prionailurus viverrinus</i>)	81
Frank	The effect of anthropogenic noise on vigilance behaviour: a meta-analysis	82
Batabyal	From isolation to recovery: social buffering of behavioural stress in the pond snail <i>Lymnaea stagnalis</i>	83
Berardi	Behavioural flexibility among the European herring gull and the lesser black-backed gull in a foraging context	84
Szigeti	First steps towards mapping the dog vocal repertoire – a behaviour test battery	85
Yeowart	Behavioural responses to long-term artificial light at night exposure in a freshwater amphipod (<i>Gammarus pulex</i>)	86

Presenters are expected to be present at their posters during the designated poster sessions (even numbers: Wednesday, 2nd September 2026, 1500-1600; odd numbers: Thursday, 3rd September 2026, 1500-1600).

Overview of Symposia



Fish behaviour in a changing world

Symposium organisers: Dr Joachim Frommen¹, Dr Adam Reddon² and Dr Will Swaney²

¹Manchester Metropolitan University

²Liverpool John Moores University

Description: With more than 30,000 species, fishes are the largest vertebrate group and are found in hugely varied habitats, from alpine rivers to the deepest ocean floor. However, no matter the environment, fishes are increasingly confronted with human-induced environmental change, from light and sound pollution, to warming water temperatures, microplastic accumulation and changes in water chemistry and turbidity. These changes all have the potential to impact fish behaviour, for example through effects on communication and competitive interactions, on sex development and mating behaviour, and on conspecific and heterospecific social structures. Understanding the full effects of human-induced environmental change on fishes is often challenging, as the environments in which they live are so fundamentally distinct from our own. In this symposium we will highlight research that is exploring the behavioural impacts of human-induced environmental change on fishes, and that sheds light on how fish behaviour is changing in their often rapidly changing habitats.

Keynote speakers: Dr Erin McCallum (Swedish University of Agricultural Sciences) and Prof Christos Ioannou (University of Bristol)

Methods to study curiosity-like behaviours in animals

Symposium organisers: Dr Tiago Monteiro¹ and Dr Victor Ajuwon²

¹University of Veterinary Medicine Vienna

²University of Cambridge

Description: Curiosity, the motivation to investigate and learn, is fundamental to human intelligence. However, like other cognitive capacities that were thought to be unique to humans, evidence is beginning to emerge that other animals also possess an intrinsic tendency to learn, challenging conventional thinking about the evolution of decision-making mechanisms that operate in animal brains. The neuroscience and psychology of curiosity has recently received increased attention because of its importance in cognitive function and its implications for the development of artificial general intelligence. Despite recent advances in our understanding of curiosity, fundamental questions remain about the cognitive mechanisms, neural substrates, and evolutionary origins that underpin this enigmatic ability.

In this symposium we aim to highlight novel research investigating curiosity-like behaviour across taxa, shining a light on a variety of experimental methods that promise to refine our understanding of curiosity, the cognitive substrate that underpins it, and its evolutionary origins.

Keynote speakers: Dr Sofia Forss (University of Zurich) and Dr Megan Lambert (University of Veterinary Medicine Vienna)

This symposium is associated with a Special Collection in *Animal Cognition*.

Authors interested in contributing can find further details here:

<https://link.springer.com/collections/iedjddhbcd>



SPRINGER
NATURE

published by:

Social cognition in a human world

Symposium organisers: Dr Elias Garcia-Pelegrin¹ and Dr Alizée Vernouillet²

¹National University of Singapore

²University of Vienna

Description: Human influences on the environment are everywhere, ranging from the incidental in the form of urbanization and habitat fragmentation, to the intentional influences of zoo settings and animal farming. Both wild and captive animals need to adapt to these human-induced rapid environmental changes. Not only are animals faced with threats such as pollution, climate change, and increased likelihood of human interactions, they also need to deal with increased competition due to higher densities of conspecifics and heterospecifics in the ever-dwindling suitable habitats. Nevertheless, certain species appear to adjust more successfully to these challenges than do others. This symposium explores how social cognitive abilities may facilitate the exploitation of new resources, and likewise, how human influence on the environment – from the incidental influence of urbanization, pollution or habitat loss to the intentional influence of zoo settings and intensive farming – affects social cognition.

Keynote speakers: Dr Fay Clark (University of Bristol) and Dr Lisandrina Mari (University of Jyväskylä)

Sensory landscapes in the Anthropocene: how human activity reshapes animal information use

Symposium organisers: Dr Francisco Ruiz-Raya and Dr Arianna Passarotto
University of Glasgow

Description: Human activities are inducing unprecedented transformations in the environments animals occupy. These changes, whether caused by anthropogenic noise, artificial light at night, habitat modification, and/or chemical pollution, alter the natural sensory landscape, with multifaceted impacts on the availability, reliability, and transmission of cues and signals used for reproduction, navigation, foraging, predator avoidance, and social interactions. Animals typically integrate information across different sensory modalities, making them particularly vulnerable to sensory mismatch and ecological traps in human-altered landscapes. This symposium brings together empirical and theoretical work examining how altered sensory environments affect behaviour across taxa and ecological contexts, addressing pressing questions such as, but not limited to, disruption of acoustic and chemical information in noisy and polluted habitats, or changes in the use of visual cues and coloration in modified light environments. By integrating research across sensory modalities and behaviours, this symposium aims to advance our understanding of how animals cope with rapidly changing sensory landscapes.

Keynote speaker: Dr Ulrika Candolin (University of Helsinki)

In the spotlight: impacts of artificial light at night on invertebrate behaviour

Symposium organisers: Dr Emmanuelle Briolat and Dr James Galloway
University of Exeter

Description: Artificial light at night (ALAN) is a growing anthropogenic threat, causing rapid changes to natural cycles and nighttime lighting on a global scale. In the past 20 years, an explosion in research has uncovered harmful effects in plants, animals and microbes, in terrestrial and aquatic environments, at all levels from individual physiology and behaviour to ecosystem function. Invertebrates have long been a key focus: besides the well-known attraction of nocturnal insects to lights, ALAN is now known to affect invertebrates in a myriad ways, disrupting key behaviours and ecological interactions, including in unexpected places, from zooplankton in the water column to soil-dwelling earthworms. Alarming evidence of recent insect declines creates urgency to better understand the impacts of ALAN on invertebrate behaviour, and its long-term consequences for populations and ecosystem services. A vibrant community of researchers in diverse fields, from neurobiology to macroecology, has emerged to tackle this challenge. This symposium will provide a forum to discuss new findings and their implications for mitigation strategies, as well as connect with other behavioural biologists.

Keynote speakers: Prof Dan-Eric Nilsson (Lund University) and Dr Bridgette Farnworth (Victoria University of Wellington)

Leveraging new bioacoustics advances for behaviour-informed conservation

Symposium organiser: Dr Holly Root-Gutteridge
University of Lincoln

Description: Conservation of endangered species is often challenged by a lack of understanding of their behavioural ecology, particularly habitat use, dispersal, and inter-group interactions. Fragmentation of populations may be the result of behavioural disturbances (both anthropogenic and intraspecific) as well as habitat disruption. As endangered species often occupy remote and inaccessible areas, with small population sizes mean that a comprehensive understanding of their behaviour ecology is rarely easy to achieve.

Recent technological advances in the acoustic monitoring of wildlife populations have dramatically enhanced the ability to process large amounts of recorded data, using AI to detect and classify animal sounds. Using multiple recording devices to triangulate sound locations, and integrating cellular and radio communication channels means that animal activity can be monitored in real time.

This symposium will allow researchers using bioacoustics for conservation behaviour research to present their new developments, learn from each other's techniques, and to synthesise new approaches that will leverage the power of new artificial intelligence and machine learning algorithms.

Keynote speakers: Dr Arik Kershenbaum (University of Cambridge) and Dr Angela Dassow (Carthage College)

Social transfers and socially transferred materials in a changing world

Symposium organisers: Dr Adria LeBoeuf and Arthur Matte
University of Cambridge

Description: Socially transferred materials (STMs), like eggs, milk, ejaculates, social regurgitates, are substances transferred between conspecifics that shape recipient phenotypes through nutrients, genetic material, symbionts, hormones, and immune factors. As global change accelerates, understanding how these private physiological channels mediate adaptive and maladaptive responses becomes urgent. We invite abstracts addressing: (1) how environmental stressors (temperature, pollution, habitat change) alter STM composition and function; (2) theoretical frameworks for STM evolution, including indirect genetic effects and sexual conflict; (3) the origins and diversification of social transfer behaviours; (4) transgenerational plasticity mediated by STMs; (5) STMs as biomarkers for environmental stress; and (6) conservation implications of STM disruption. We welcome contributions across taxa and approaches, from molecular mechanisms to evolutionary theory, that advance our understanding of how STMs shape adaptation in a rapidly changing world.

Keynote speakers: Prof Elva Robinson (University of York) and Arthur Matte (University of Cambridge)

Primates in the Anthropocene: the ecology of adaptive behavioural responses

Symposium organiser: Dr Adrian A Barnett
University of Greenwich

Description: Primates are one of the world's best-studied animal groups in Behavioural Ecology terms. This, plus their intelligence and adaptability, allows nuanced and in-depth studies of how member of this group have adapted their interactions with human-mediated impacts and what this bodes for primate biology and conservation in the future. Six speakers cover a diverse range of topics that will both inform attendees and be the basis for a journal special edition or book.

Keynote speakers: Prof Bruna M Bezerra (Universidade Federal de Pernambuco)

From minds to populations: functional links in coexistence in the Anthropocene

Symposium organiser: Dr Nishant Kumar

National Centre for Biological Sciences and University of Oxford

Description: The Anthropocene represents a global ecological experiment, subjecting animals to unprecedented environmental transformations. While some species face collapse, others – synanthropes and exploiters – thrive in the 'human niche'. This symposium explores the mechanistic pathways driving these divergent outcomes by tracing the functional links between individual cognition, behavioural flexibility, and demographic responses. We shall prioritise examining and discussing how decision-making processes – such as innovation, tool use, risk-taking, and movement strategies – scale up to shape population dynamics and species persistence, moving beyond descriptive studies of urban adaptation. Bringing together perspectives on diverse taxa, this session investigates how animals perceive and navigate human-modified landscapes. We examine the role of phenotypic plasticity and 'cognitive buffering' in mitigating anthropogenic stressors, from fragmented habitats to novel cues and food-subsidies. Key discussions will focus on the behavioural filters that determine whether human-nonhuman interactions result in coexistence or conflict. We shall showcase integration of fine-scale behavioural data with long-term demographic trends, aiming to deconstruct the successful strategies of "urban winners" and the maladaptive ecological/evolutionary traps faced by the rest. This holistic approach offers a predictive framework for understanding biodiversity shifts, ensuring that conservation/management interventions are grounded in the fundamental principles of animal behaviour and evolutionary ecology.

Keynote speakers: Prof Christian Rutz (University of St. Andrews) and Prof Aldina Franco (University of East Anglia)

Practical and theoretical challenges in reptile and amphibian cognition: bridging methods, ecology and innovation

Symposium organiser: Dr Francesca Maura Cassola¹ and Prof Anna Wilkinson²

¹Anglia Ruskin University

²University of Lincoln

Description: Cognitive research in herpetology has grown rapidly, yet it remains affected by theoretical, methodological, and practical challenges. Many paradigms were originally developed for mammals and birds, raising questions about their validity for ectotherms and their relevance to ecology and fitness in natural settings. Empirical work is also constrained by limited access to study populations, small sample sizes, welfare considerations, and the lack of standardised protocols.

This symposium will bring together researchers to critically reflect on both the solutions already developed and the remaining obstacles. We welcome contributions that: (i) present innovative experimental designs tailored to reptile and amphibian biology; (ii) link cognitive performance to ecologically relevant traits; (iii) address issues of individual variability, motivation, and the effects of captivity; and (iv) discuss practical challenges related to funding, infrastructure, training, and collaborative networks. By integrating empirical and theoretical perspectives, the symposium aims to identify priorities and promote more integrative, comparable, and impactful studies on reptile and amphibian cognition.

Keynote speakers: Dr Stephan Reber (Lund University) and Dr Birgit Szabo (Ghent University)

Abstracts



Rethinking how we measure cognition in the wild: insights from an experiment in wild bird

Vildan Acar¹, Hugh J Hanmer², Jennifer A Gill¹, David S Richardson¹, Gabrielle L Davidson¹

¹University of East Anglia, United Kingdom

²British Trust for Ornithology, United Kingdom

Automated systems generate high-resolution behavioural data from wild populations. Despite advances in computational tools, criterion-based thresholds to quantify cognitive performance are still widely applied. We argue these methods are outdated and unsuitable as they discard useful data and fail to detect relevant nuances in how individuals explore and learn in the wild. These limitations were apparent in our experiment on flocks of blue tits (*Cyanistes caeruleus*) and great tits (*Parus major*) where the use of such thresholds overlooked inconsistent post-criterion behaviour and variable foraging strategies as revealed by temporal clustering. To improve behavioural quantification, we present five alternative methods that either partition visits into foraging bouts or incorporate the full learning trajectories throughout the experiment. We determined which method best captures learning dynamics by comparing observed data against the Rescorla-Wagner model-based simulations. Our findings provide a framework for selecting appropriate metrics for future field studies to better describe learning and underlying cognitive processes in the wild.

Where is my nest: impact of pesticide on the memory of a tandem-running ant *Diacamma indicum*

Anwesha Acharjee¹, Pranita Santra^{1,2}, Sumana Annagiri¹

¹Behaviour and Ecology Lab, Department of Biological Sciences, Indian Institute of Science Education and Research Kolkata, Mohanpur, West Bengal 741246, India

²Indian Institute of Science Education and Research Mohali, Punjab 140306, India

Insects comprise over half of all living organisms but over 40% of them are declining in the Anthropocene. Massive increase in the use of chemical pesticides has resulted in population declines. Pesticide exposure negatively impacts memory and cognitive functions. We asked whether pesticide (cypermethrin) exposed ants were capable of navigating back to their nest in *Diacamma indicum*, a tropical ponerine ant which uses tandem running as the mode of recruitment during nest relocation. We exposed ants to indirect contact and examined the impact on naturally acquired navigational memory without any prior artificial training paradigms. Using 231 ants who were tandem leaders and foragers from 43 colonies we performed three experiments in the lab and a semi-natural field set-up. Pesticide exposed ants had significantly lower rates of returning to their nest and their paths were also different as compared to controls. This study is the first in addressing the gap in understanding the impact of pesticide contamination on the memory of ants. In the next step the neuroethological consequences and implications across trophic levels need to be investigated.

Flexible instrumental information-seeking in a corvid

Victor Ajuwon, Adam Timulak, Nicola S. Clayton
University of Cambridge, United Kingdom

The ability to accurately predict action outcomes is key for flexible and innovative behaviour. However, outcome stochasticity presents a significant decision-making challenge for individuals. We explored whether Eurasian jays (*Garrulus glandarius*, $n=3$) could learn to seek information about the location of a prospective food reward. We hypothesised that jays would be more likely to seek information about reward location when location uncertainty was higher. Jays were trained on a task where they were shown that a wax worm could be found under either one of two cups with 50% probability. The pecking of a central, unbaited cup resulted in the experimenter revealing the location of the trial's reward by lifting the baited cup. Over several sessions jays learned to induce the reveal of the reward location by pecking the central cup first, before choosing the reward location, which improved accuracy. When reward location was immediately revealed by the experimenter in test trials, jays were less likely to seek location information before choosing, demonstrating sensitivity to uncertainty, and flexibility in information-seeking behaviour during foraging.

Urban chaffinches are less flexible in territorial aggression than rural chaffinches

Çağlar Akçay¹, Alper Yelimliş^{2,3}, Çağla Önsal^{4,5}

¹Centre of Ecology, Evolution and Environment, Anglia Ruskin University, United Kingdom

²Konrad Lorenz Research Center for Behavior and Cognition, Grünau im Almtal, Austria

³Department of Behavioral and Cognitive Biology, University of Vienna, Vienna, Austria

⁴Department of Evolutionary Biology, University of Bielefeld, Bielefeld, Germany

⁵Institute of Avian Research "Vogelwarte Helgoland", Wilhelmshaven, Germany

Behavioral change and individual plasticity are generally hypothesized to be the key to adapting to challenges brought about by human induced rapid environmental changes. One commonly observed behavioral change is higher observed aggression levels in urban animals, perhaps because anthropogenic noise disrupts effective acoustic communication during conflicts, leading to greater use of physical aggression. We investigated the hypothesis that urban noise drives aggression by performing repeated simulated territorial intrusion experiments on rural and urban chaffinches (*Fringilla coelebs*). We expected urban chaffinches to be more aggressive, change their aggression levels more between trials, and for aggression to increase with noise levels, irrespective of the habitat. We found that while aggression did not differ between habitats in the initial trial, rural chaffinches decreased their aggression level in the second trial and thus were less aggressive than the urban chaffinches, which did not change their response. That is, urban birds were less flexible in responding to an intruder than rural birds, contrary to previous findings in other songbirds. Moreover, aggression levels correlated positively with ambient noise levels.

Heatwaves make males hotter: increased mating success after heat stress in a subtropical field cricket population

Yasmin Naz Akyürek¹, Sofia Gigliotti², Martina Di Pompa¹, Brian Fisher³, Sylvain Hugel⁴, Clelia Gasparini², Cristina Tuni¹

¹Department of Life Sciences and Systems Biology, University of Turin, Turin, Italy

²Biology Department, University of Padova, Italy

³Department of Entomology, California Academy of Sciences, San Francisco, CA 94118, United States of America

⁴Institut des Neurosciences Cellulaires et Intégratives, Centre National de la Recherche Scientifique, Université de Strasbourg, 67000 Strasbourg, France

Climate change is increasing the intensity and frequency of extreme climatic events. Heatwaves negatively affect biological functions, including reproduction. Fertility is thermally sensitive in ectotherms, but less is known about effects on reproductive behaviour. We studied the field cricket *Gryllus bimaculatus* from a subtropical population to test the effect of a simulated heatwave (3-day exposure to 30°C) on male courtship song and mating success. We hypothesized that heat stress would reduce mating success via impaired singing performance. Males exposed to heatwaves produced lower quality courtship songs (i.e., reduced tick rates and increased trill duration) but showed higher mating success. These results suggest that heat stress reduces acoustic signal quality, likely due to energetic constraints, without decreasing mating success. Males may compensate for poor singing by relying on chemical or vibrational signals, with females basing their choice primarily on these cues.

Marine heatwaves and hypoxia disrupt escape responses without affecting group structure in early stages of *Atherina presbyter*

João Almeida¹, André Lima^{2,3}, Ana Filomena Pedroso⁴, Ana Rita Lopes⁵, Ana M. Faria⁶

¹MARE - Marine and Environmental Sciences Centre/ARNET-Aquatic Research Network, ISPA-Instituto Universitário, 1149-041 Lisbon, Portugal

²CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado, Universidade do Porto, Vairão, Portugal

³BIOPOLIS Program in Genomics, Biodiversity and Land Planning, CIBIO, Vairão, Portugal

⁴Faculty of Sciences, University of Lisbon, Campo Grande, 1749-016 Lisbon, Portugal

⁵Department of Animal Biology, Faculty of Sciences, University of Lisbon, Campo Grande, 1749-016 Lisbon, Portugal

⁶Atlantic International Research Centre, Lisbon, Portugal

Marine heatwaves (MHWs) are increasing in frequency and intensity, and often coincide with hypoxia events in coastal regions. Together, these stressors can alter fitness-related behaviours, such as group structure and escape responses. However, their interactive effects remain poorly understood, particularly during early stages. To address this gap, we tested whether the effects of MHWs alone differed from those of MHWs combined with hypoxia on group structure (nearest-neighbour distance, inter-individual distance, and variance of inter-individual distance), and escape response (responsiveness, directionality, laterality, latency, maximum and average speed, and escape distance). Our results show that *Atherina presbyter* maintains overall group structure as temperature increases. However, prolonged exposure leads to early signs of stress, including a reduced escape distance. Acute exposure to MHW and hypoxia does not affect escape performance, but induces small-scale reorganization within the group without altering its overall structure. After five days of combined exposure, individuals exhibit behavioural plasticity, with nearest-neighbour distance returning to control levels. However, escape performance deteriorates, as indicated by increased latency and reduced average speed and escape distance.

Deep learning reveals ultraviolet-dependent shifts in mimicry under predation

Kai Amino^{1,2}, Theo Brown¹, Reinier van Buchem^{1,3}, Katja Rönkä¹, Timothée Poupart¹, Johanna Mappes¹

¹University of Helsinki, Finland

²Nagoya University, Japan

³University of Amsterdam, The Netherlands

Ultraviolet (UV) light is invisible to humans but is perceived by most avian predators and plays an important role in predator–prey visual communication. In mimicry systems, resemblance between species determines protection from predation, yet the role of UV in shaping mimetic accuracy remains largely untested in learning experiments with live predators. To identify cases where UV is likely to affect mimicry, we first used deep learning to screen butterfly specimen images and detect mimetic pairs whose similarity changes under UV conditions. From the tiger *Danaus* mimicry ring, we selected two candidate pairs and tested predator responses in a learning experiment using great tits (*Parus major*) under UV-present and UV-absent conditions. UV presence significantly increased overall attack rates on prey. In addition, UV asymmetrically altered attack probabilities between mimics in the direction predicted by the deep learning analysis. These results demonstrate that UV cues influence predator decision-making in mimicry systems and highlight deep learning as an efficient tool for identifying ecologically relevant test cases, reducing experimental effort when working with live animals.

How does the invasive Asian common toad impair the native amphibian fauna of Madagascar

Edward John Andrews^{1,2}, Sue Anne Zollinger¹, Rebecca N Lewis², Charles Wheeler², Martin J Sullivan¹, Joachim G Frommen¹

¹Manchester Metropolitan University, United Kingdom

²Chester Zoo, United Kingdom

Amphibians are one of the most threatened animal taxa, facing unprecedented rates of population decline with the highest number of species facing extinction. Despite this a few invasive anuran species pose a major threat to ecosystems. Our understanding of the pathways, timescale and effect on native fauna of invasive amphibians is limited as detailed research has been restrained to only a few species. The Asian common toad (*Duttaphrynus melanostictus*), a newly invasive species to Madagascar, belongs to the same family as one of the most deeply studied cases of invasive amphibians, the cane toad (*Rhinella marina*). The Asian common toad arrived in Madagascar approximately 10 years ago and has been extending its range since then. We are aiming to understand effects caused by the introduction of a novel toxic, loud toad species on the native amphibians, while identifying which niches are most likely to be affected. The goals are to limit the effect on the endemic and micro endemic species found close within the predicted expansion range of this highly invasive species, by understanding its effects on behaviour and the environment throughout its life stages.

The influence of drought on survival, reproduction, social structure, and body condition of Asian elephants

S Anvitha¹, Anarghya B Raghav^{1,2}, TNC Vidya³

¹Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru, India

²Indian Institute of Science and Research, Mohali, India

The increasing frequency and intensity of extreme climatic events make it crucial to examine animal responses to past events to assess vulnerability and predict future outcomes. Droughts may strongly affect Asian elephants due to their high water and forage requirements, yet their impacts remain poorly studied. Using long-term data from the Kabini Elephant Project, we evaluated the short-term effects of two droughts (2013, 2017) on mortality, natality, social structure, and body condition of elephants in the Nagarahole and Bandipur Tiger Reserves in southern India. Mortality rate (N=235), especially among calves, increased, and body condition (N=56) declined during the severe 2017 drought. Annual birth probability (N=163) was lowest two years later. Social network analysis revealed that degree, strength of association, and experienced group size declined during the 2017 drought in adult females (N=56) from large-sized clans, indicating reduced sociality, possibly due to increased competition for scarce resources. The less severe 2013 drought had no statistically detectable effects on the above variables, suggesting resilience to moderate fluctuations in resource availability.

Cows observe our behaviour and may even form reputations of humans

Océane Amichaud, Juliette Cognie, Céline Parias, Julie Lemarchand, Fabien Cornilleau, Vitor H.B. Ferreira, Ludovic Calandreau, Léa Lansade
INRAE, Centre INRAE Val de Loire, 37380 Nouzilly, France

Domestic animals interact daily with humans, whose behaviour can affect their welfare and production. Understanding how cattle perceive human cues is therefore important. Animals may evaluate humans directly or indirectly through social eavesdropping, i.e., by observing interactions between others. In farming contexts, this ability could help animals identify individuals likely to behave positively and avoid those associated with negative experiences. This study investigated whether cows can attribute a reputation to humans by observing cow-human interactions. Forty-two cows watched two videos showing either a positive or a negative interaction involving different experimenters, who were subsequently presented simultaneously in a choice test. Cows showed greater attention, vigilance, and increased heart rate when viewing the negative interaction. At the start of the choice test, they preferentially touched the experimenter previously associated with the positive interaction. These findings demonstrate that cows can discriminate between positive and negative human-animal interactions and may use this information to guide their behaviour in subsequent encounters with humans. This highlights the importance of positive handling, as observed interactions may influence not only directly involved animals but also conspecifics witnessing the event.

Behavioural responses of grey squirrels (*Sciurus carolinensis*) to volatile organic compounds produced by *Populus* trees

Alexandra Ash^{1,2}, John A Pickett³, Rebecca Spake¹, Sahar Kandil³, Elizabeth Roche³, Robin MA Gill², Christopher P Nichols⁴, Charles Dutton⁵, Patrick Doncaster¹

¹University of Southampton, United Kingdom

²Forest Research, United Kingdom

³Cardiff University, United Kingdom

⁴Woodland Trust, United Kingdom

⁵Charles Dutton & Co, United Kingdom

Grey squirrels in Britain extensively damage broadleaf trees by stripping their bark, causing structural deformities, wood staining and decay, and tree death. Bark-stripping impacts on health, growth and longevity of trees which has significant implications for timber production and carbon sequestration. Currently, no non-lethal mitigations have succeeded in preventing or reducing grey squirrel damage. We tested the potential for volatile organic compounds (VOCs) produced by trees to repel or attract free-ranging grey squirrels. From trees that vary in their susceptibility to squirrel damage, we selected three foliage-produced VOCs associated with least susceptible and three associated with most susceptible clones. We ran field-experimental tests of their influences on behaviours of free-ranging grey squirrels at feeding hoppers. Overall, squirrels responded negatively to VOCs associated with damage-resistance, and positively to VOCs associated with damage-susceptibility. VOCs associated with natural tree defensive or attractive properties have potential to inform the development of novel, non-lethal chemical methods to manage bark-stripping behaviour by grey squirrels.

Mammals favour structure, flee extraction: evidence from Kumaon Himalaya, India

Mirza Altaf Baig, Nazneen Zehra, Jamal Ahmad Khan
Aligarh Muslim University, India

Man-dominated regions pose increasing behaviour issues for wildlife amid the Anthropocene. We explored mammalian demographic structure and temporal dynamics, along with the responses to human-induced activities within the Ranikhet forests of Kumaon Himalaya, India. Methods employed were sign surveys, trail counts (forest and road trails), and nocturnal flashlight surveys. The multi-season surveys (2022-24) resulted in documentation of 15 mammalian species from the study area. Ungulates displayed significant winter bias: *Muntiacus vaginalis* - (16.81% vs. 5.31%; $\chi^2 = 11.2$, $p < 0.001$); *Rusa unicolor* - (28.32% vs. 18.58%; $\chi^2 = 23.6$, $p < 0.001$), reflecting genuine shift under phenological changes and anthropogenic activity prevalence. *Panthera pardus fusca* indicated seasonal territorial stability ($p = 0.795$), indicating behavioural flexibility in man-altered areas. Mammalian richness was found to be positively associated with tree and shrub density ($\rho = 0.263$, $p = 0.005$; $\rho = 0.278$, $p = 0.003$) but displayed negative correlation with logging ($\rho = -0.233$, $p = 0.013$) and livestock grazing ($\rho = -0.332$, $p < 0.001$). Results showed that pressure induced by humans on forests, notably extracting the resources such as fuelwood and fodder, is resulting in influencing the mammalian population structure, spatial patterns, and temporal ecology within this biodiversity hotspot.

Kinship effects on gut microbiomes among wild meerkats (*Suricata suricatta*) in the Kalahari

Krishna Balasubramaniam¹, Nadine Mueller-Klein², Tim Vink³, Timothy H. Clutton-Brock^{3,4,5}, Marta B. Manser^{3,4,5,6}, Simone Sommer²

¹Centre for Ecology Evolution and the Environment, Anglia Ruskin University, United Kingdom

²Institute for Evolutionary Ecology and Conservation Genomics, Ulm University, Germany

³Kalahari Research Trust, Kuruman River Reserve, Northern Cape, South Africa

⁴Large Animal Research Group, Department of Zoology, University of Cambridge, United Kingdom

⁵University of Pretoria, Mammal Research Institute, Pretoria, South Africa

⁶Department of Evolutionary Biology and Environmental Studies, University of Zurich, Switzerland

Sociality shapes gut microbiomes, but the impact of kinship remains unclear despite speculation that kinship effects may be stronger in groups with higher relatedness. Using a long-term dataset from 18 groups of wild meerkats, we examined how intraspecific variation in kinship influences gut microbiomes. Across groups, kinship had a stronger effect on bacterial sharing in groups with higher average relatedness. Across individuals, meerkats' relatedness was positively associated with bacterial diversity in smaller compared to larger groups, and among subordinates compared to dominants. Relatedness strongly affected the abundance of specific bacterial taxa which also co-occurred within hosts independently of bacterial phylogeny. Finally, while relatedness positively predicted meerkats' survival, neither microbial diversity nor the abundance of kinship-associated taxa influenced survival. Together, our findings help to elucidate the socioecological contexts in which kinship shapes microbiomes, highlighting stronger effects in highly related groups, smaller groups, and among subordinates. Kin-structured bacterial co-occurrence may contribute to host homeostasis, even if it does not directly influence fitness. Future research should disentangle vertical (parent-to-offspring) and horizontal (social interaction) transmission pathways and extend analyses across species.

Ravens (*Corvus corax*) use objects to mediate social interactions with others

Awani Bapat and Thomas Bugnyar

Department of Behavioral and Cognitive Biology, University of Vienna

Social play has been shown to facilitate the formation and development of social relationships between individuals. Objects may also be used during social play or communication. Human toddlers have been reported to use objects as intermediaries in social interactions with peers. However, the use of objects in social interactions by non-human animals has received very little attention. For instance, captive ravens engage in interactions over cached objects, thereby learning about others' behaviours. In this study, we tested the hypothesis that free-flying ravens may engage in object play to attract the attention of and initiate interactions with other ravens. We recorded 588 object play bouts as well as the social interactions from 53 marked individuals. We found that object play bouts elicit approaches from bystander ravens, leading to object exchanges, as well as affiliative and agonistic interactions over them. Furthermore, juveniles received more approaches from bystanders but initiated fewer approaches towards them. In comparison, adults were more likely to approach others. We discuss the implications of these findings for relationship formation. We suggest that juveniles may employ object play as a strategy to form new relationships during social integration, whereas older birds may use it for relationship maintenance and pair bond formation.

Primate social structure drivers across climatic gradients: Trans-Amazonian model for potential climate change impacts

Adrian Barnett¹, Brandon Wheeler², Sarah A Boyle³,

¹Natural Resources Institute, University of Greenwich, United Kingdom

²Department of Life Sciences, Roehampton University, London, United Kingdom

³Biology Department, Thompson Rivers University, Kamloops, British Columbia, Canada

Responses to climate change are generally shaped as the geographical relocation of a species current climate envelope to new areas following IPCC-defined models. However, adaptive flexibility demonstrated by behavioural plasticity in natural communities is rarely considered in climate-change ecological studies. Accordingly, using GAIK and MGLM, we establish links between social structure, reproductive window duration, regional phenology, soil fertility and seasonal rainfall patterns for primate in 9 genera (*Alouatta*, *Ateles*, *Cacajao*, *Cebus*, *Chiropotes*, *Lagothrix*, *Pithecia*, *Saimiri* and *Sapajus*) across a latitudinal transect of the Amazon basin (where soil fertility and rainfall patterns have pronounced E-W gradients). Using IPCC scenarios to model likely climatic and vegetational changes at each data source location, we deploy trends observed in extant populations along the latitudinal transect to predict future social structures for primate species at each site, considering if, rather than migrating to inhabit a similar climate, populations adapted to new conditions by responding to climatic conditions with novel phenology-mediated social structures and reproductive profiles.

Bycatch-induced evolution of behaviour appears unlikely in a wild sea bird population

Marie Barou-Dagues¹, Anne-Sophie Bonnet-Lebrun¹, Timothée Bonnet¹, Ewen Le Scornec¹, Pauline Richard¹, Nicolas Gasco², Charlotte Chazeau², Clara Péron², Elodie Schloesing¹, Karine Delord¹, Henri Weimerskirch¹, Christophe Barbraud¹, Julien Collet¹

¹Centre d'Études Biologiques de Chizé, CNRS-La Rochelle Université, UMR 7372, Villiers en Bois, France

²Muséum national d'Histoire Naturelle, BOREA, Département Adaptations du vivant, Paris, France

In face of rising anthropogenic threats, the relative importance of genetic adaptation, selective disappearance and phenotypic plasticity to help populations avoid collapse remains poorly understood -especially for behavioural traits. We examined the repeatability and heritability of behaviours involved into seabird exposure to bycatch mortality in fisheries (encounter rates, attraction upon encounter, residence time once attracted). We used 14 years of bird and fishing vessels GPS tracking combined with pedigree, fishing activity and environmental data on a population of wandering albatrosses. Repeatability was very low, except for attraction upon encounter ($R > 0.3$, across years, with some individuals consistently ignoring all encounters), for which heritability reached 0.128, but with high uncertainty. Encounter rates did not correlate with behaviours upon encounter nor once attracted, and fishing activity and wind strength accounted for most part of the other behaviours' variance and covariance. These results suggest a strong contribution of context-dependent plasticity and support the existence of a consistently low-exposure phenotype from which populations might avoid collapse, but with only little scope for a rapid genetically based behavioural adaptation to this anthropogenic threat.

From isolation to recovery: social buffering of behavioural stress in the pond snail *Lymnaea stagnalis*

Anuradha Batabyal¹, Claire Stephen², Pierfrancesco Sarti³, Eleonora Daini³, Cristina Benatti³, Johanna Maria^{3,4}, Fabio Tascetta^{3,4}, Ken Lukowiak², Veronica Rivi³

¹FLAME University, India

²University of Calgary, Canada

³University of Modena and Reggio Emilia, Modena, Italy

⁴Catharina Blom University of Modena, Italy

Social interactions influence cognitive function and resilience across species, but the shared principles governing recovery from social deprivation remain unclear. We investigated the effects of social isolation on exploratory behaviour (as an indicator of motivation), feeding (as an indicator of anhedonia), and memory formation in the great pond snail, *Lymnaea stagnalis*, and determined whether these effects could be reversed by re-exposure to social groups. Social isolation caused pronounced deficits in behaviour and memory; however, recovery depended on social familiarity, with snails fully recovering exploration, feeding, and memory when reintroduced to a familiar group rather than an unfamiliar one. We also extended this framework to examine whether other stressors, such as fear or immune challenge, can be buffered by conspecific presence. Preliminary results suggest that the presence of unstressed individuals can attenuate fear- and stress-related behavioural changes in this species. This showcases the importance of social cues in a changing environment, where conspecific information is essential for decision-making and adaptation to novel conditions.

Social transfer of immunity under varying environmental conditions in speckled mousebirds

Bebbington K¹, Czirják GÁ², Bhembe ZD³, Matson KD¹, Monadjem A⁴, Kingma SA⁵

¹Wildlife Ecology and Conservation Group, Department of Environmental Sciences, Wageningen University, The Netherlands

²Department of Wildlife Diseases, Leibniz Institute for Zoo and Wildlife Research, Germany

³Department of Biological Sciences, University of Eswatini, Eswatini

⁴Mammal Research Institute, Department of Zoology & Entomology, University of Pretoria, South Africa

⁵Behavioural Ecology Group, Department of Animal Sciences, Wageningen University

The increased risk of parasitic infections among group-living animals is often proposed as a key limitation in the evolution of complex sociality, but we have limited understanding of the mechanisms that might evolve in social animals to mitigate this risk. Social immunity, such as the transfer of immune-related compounds between group members via shared body materials, is one intriguing pathway by which group-living animals might increase collective parasite defence. Social transfer of immune molecules may be strongly favoured in environments where parasitic pressure is high, such as under weather conditions favourable to parasite survival and transmission. In this study, we use the highly-social speckled mousebird, *Colius striatus*, as a model system to test whether the immunological composition of socially-transferred saliva varies with environmental conditions and parasitic pressure. We first explore the influence of rainfall and temperature on ectoparasite infection and load. We then test whether the concentration of immune molecules are correlated with environmental conditions in a way that would maximise the benefit of socially-transferred immunity under high parasitic pressure. Our results reveal how environmental conditions can indirectly influence the composition of socially-transmitted materials via selection on social immune defences.

How colony organization shapes spatial segregation in a marsh tern, the Whiskered tern (*Chlidonias hybrida*)

Océane Bégassat¹, Françoise Amélineau¹, Alexandre Corbeau¹, Christophe de Franceschi², Laura Beau¹, Jean-Marc Paillisson³

¹ECOBIO (Ecosystèmes, Biodiversité, Evolution), Univ Rennes, CNRS, France

²CEFE (Centre d'Ecologie Fonctionnelle & Evolutive), Univ Montpellier, CNRS, EPHE, IRD, 34090 Montpellier, France

³Réserve Naturelle Nationale de Chérine, 36290 Saint-Michel-en-Brenne, France

Colonial breeding entails costs (e.g. competition, disease transmission) and benefits (e.g. social information, collective vigilance). As a behavioural response, spatial segregation of foraging areas among neighbouring colonies (the “diplomacy hypothesis”) is well documented in seabirds but rarely tested in other taxa. Additionally, within colonies, overlap in foraging ranges may arise from social information transfer, allowing individuals to exploit ephemeral and unpredictable resources. Here, we investigate how colony organization shapes space use in a marsh tern, the whiskered tern (*Chlidonias hybrida*), at Lake Grand-Lieu (France), where several colonies breed in close proximity (0.6–3.8 km), potentially sharing foraging habitats. Using high-resolution GPS tracking data from 15 breeding events across five colonies, we estimate home ranges (AKDE), quantify overlap within and between colonies, and test for density-dependent variation in home-range size. By linking colony organization to individual space-use, this study contributes to a better understanding of how social context shapes movement strategies in a colonial central-place forager.

Behavioural flexibility among the European herring gull and the lesser black-backed gull in a foraging context

Emma Berardi¹, Camille Troisi², Maxime Pineaux³, Marine Leicher³

¹Université de Toulouse, France

²CEEC – Centre for the Study of Ethology and Cognition - UMR 6552, ex-EthoS, France

³Bretagne Vivante sepnb, France

Gulls show large flexibility and plasticity in foraging behaviour and exploit various habitats. While urban gull colonies have continuously flourished in the last decades, colonies established on islets are plummeting. It is not clear why such opposing dynamics arose but they might be linked to differences in foraging ecology between urban and natural colonies. Our study investigated the diversity and specialization in habitat use throughout the full biological cycle of gulls, over multiple years. We used GPS data collected since 2023 on *Larus argentatus* (N=26) and *Larus fuscus* (N=38), from 3 colonies in the South of Brittany in France. We then focused our analysis on Lorient, a town with human-gull conflict. We ran detailed analysis to understand the use of memory during revisits to specific (potentially conflictual) areas. The shift to urban areas generates conflicts with humans. Our results show between colony variation in habitat selection, suggesting that different colonies may require different management strategies. We also found individual differences in foraging strategies. This implies that a case-by-case assessment for conservation or management may also be necessary.

Microhabitat selection in fire salamanders (*Salamandra salamandra*) from core and managed forest areas in the Vienna Woods

Rebecca Berger, Kristin R. Szydlík, Bibiana Rojas

Konrad Lorenz Institute of Ethology, University of Veterinary Medicine Vienna

Human management of forest areas results in alterations in temporal and spatial availability of resources, forcing animals to adjust their behaviour to withstand changing conditions. To assess the influence of habitat alteration on population health, a better understanding of habitat selection is crucial. Fire salamanders, and amphibians in general, are particularly vulnerable to environmental changes due to the permeability of their skin and their dependence on factors such as humidity and temperature. Therefore, they are a suitable model species for investigating the impact of habitat degradation and climate change on their microhabitat selection. We investigated patterns of microhabitat selection in fire salamanders in four different locations in the Vienna Woods, two of them being managed and two of them being unmanaged forest areas. Between September and November 2025, data collection was performed along pre-established transects in each of the sites. Every salamander in a two-meter radius to the transects was considered and the used microhabitat as well as the percentage of available microhabitats were recorded. Our preliminary results show a significantly higher selection for deadwood in all four locations in comparison to its availability. Despite the high availability of leaf litter and bare soil, those were chosen proportionally less than expected. However, no significant differences in habitat selection were found between managed and unmanaged sites, suggesting individuals generally prefer deadwood, making use of whatever is available at each site.

Has domestication eroded cooperation in dogs?

Karoline Berweiler¹, Sandro Sehner², Gwendolyn Wirobski³, Klaus Zuberbühler³,
Friederike Range²

¹University of Vienna, Austria

²University of Veterinary Medicine Vienna, Austria

³University of Neuchâtel, Switzerland

Cooperation is widespread across the animal kingdom. In many species, multiple individuals work together, e.g. to increase hunting success, protect conspecifics, or defend territories. However, whether such cooperation reflects active coordination or parallel, independent actions remains unresolved. A common approach is to investigate communication between cooperating individuals. Here, we compared two closely related species that differ in their propensity to cooperate with conspecifics: wolves (*Canis lupus*) and dogs (*Canis lupus familiaris*). While wolves are generally cooperative breeders that hunt in packs, dogs typically breed and forage independently. Nevertheless, both species engage in group territorial defence. We elicited territorial defence behaviour by walking an unfamiliar wolfdog along the enclosures of wolf and dog packs and examined communication among pack members. Preliminary data suggest that wolves and dogs differ in their territorial defence behaviour. Dogs respond fast and rather independently towards the intruder, whereas wolves show more composed and coordinated responses. This study helps to understand how domestication has shaped cooperation in canids.

Underwater soundscape effect on fish behaviour depends on their ability to perceive and produce sounds

Eduardo Bessa, Maycon Chaves, Eduardo Leonardecz, Audrey Looby, Kieran Cox
University of Brasilia, Brazil

Many underwater soundscapes have been altered by human activities (e.g., shipping, drilling), with anthropogenic sounds having strong impacts on fish behaviours, that vary by species. We conducted a meta-analysis to test whether the ability of fishes to produce and perceive sounds influences their responses to sounds. We reviewed behavioural impacts of anthropogenic noise on fishes, as well as how they related to the production of sounds and the presence of Weberian apparatus. We analysed 107 studies on 66 fish genera, which revealed a net detrimental impact of underwater noise. This impact was exacerbated by increased exposure duration and higher water temperatures. We also found that acoustic specializations modulate these impacts. While the Weberian apparatus increased sensitivity to specific sound types, soniferous fishes showed a nuanced response attenuated behavioural reactions to anthropogenic noise. Our analysis reinforces the potential negative effects anthropogenic sounds can have on fishes. Conservation should therefore consider the bidirectional manner that fish contribute to and are impacted by underwater soundscapes.

Shaping the future: effective public policies and primate survival in the Anthropocene

Bruna Bezerra

Laboratório de Ecologia, Comportamento e Conservação, Departamento de Zoologia, Universidade Federal de Pernambuco, Brazil

Brazil is a megadiverse country for primates (120+ spp), of which nearly 40% are threatened with extinction. The Brazilian government, academia, civil society, and the private sector created National Action Plans (PANs) to protect primate species and habitats. Brazilian States have created their own action plans to direct research and government efforts. Pernambuco's plans target five species, one of which is *Sapajus flavius*, also in Alagoas's plan and targeted in this talk. *S. flavius* is one of Brazil's most threatened capuchin species and even appeared in the Top 25 Most Endangered Primates list. Loss and degradation of the Atlantic and Caatinga Forests over the past 500 years have severely reduced their habitat. Predictive modelling indicates 90%+ loss of suitable habitat by 2070. Despite these severe impacts, *S. flavius* has shown resilience to anthropogenic pressures. We will discuss the potential strategies for its adaptation and how public policies created so far are helping. By examining the intersection of public policies, local projects, species' life history and landscape traits, we may better understand the factors influencing the species' survival in the Anthropocene.

Free-range use dogs with higher human-directed sociability show greater success in communication with humans

Urša Blenkuš¹, Giulia Cimorelli², Friederike Range¹, Sarah Marshall-Pescini¹

¹Domestication Lab, Konrad-Lorenz-Institute of Ethology, University of Veterinary Medicine Vienna, Austria

²Behavioural Ecology Group, Wageningen University & Research, Wageningen, The Netherlands

Free-range use dogs (FRDs) are the result of a long history of domestication and adaptation to human-dominated environments. FRDs live in close association with humans and rely heavily on them for food, however they show considerable variability in their human-directed sociability. Here we hypothesize that increased human-directed sociability may lead to greater resource access, by promoting an understanding of human cues in relation to food availability. Accordingly, we tested 178 FRDs in three food related tests: pointing (reading cue to find food), begging (communication with human when food is out of reach), and tractability (dogs' response when food access is temporally prevented). Human sociability was assessed through daily observations. While dogs' probability to follow pointing was above chance 0.57 ($p < 0.001$), it was not impacted by sociability ($p = 0.47$). Yet more sociable dogs showed higher proximity ($p = 0.015$), tail wagging ($p = 0.013$), and nose licking ($p = 0.031$) during begging and higher proximity ($p = 0.003$), tail wagging ($p = 0.036$), gaze alternations (0.044), nose licking (0.033), and submissive behaviours ($p < 0.001$) towards human during tractability tests. In more urban species, human sociability may be a functional trait which promotes understanding when and where their main resources come from.

The role of individual behaviour across timescales in shaping collective responses

Robert Boddington^{1,2}, Hannah MacGregor³, Sabine Hauert¹, Chris Reid², Christos Ioannou¹

¹University of Bristol, United Kingdom

²Macquarie University, Australia

³University of Cambridge, United Kingdom

Existing studies suggest that collective decision making in animal groups is shaped by factors that vary temporally, Range use from long-term consistency in behaviour (personality variation) to short-term changes, e.g., knowledge and satiation. The importance of these factors on collective responses is poorly understood. To examine this, we tested 25 groups of six three-spined sticklebacks (*Gasterosteus aculeatus*), quantifying isolated individuals' activity, and group behaviour in a shoaling assay, then testing how these properties predicted collective responses to a stimulus over sequential presentations in a foraging assay. Groups' latency to reach the stimulus slowed over the presentations. In the second before the stimulus was reached, groups became less polarised and cohesive over presentations. Groups that were cohesive whilst shoaling were more cohesive during decision making whilst foraging, showing inter-group consistency across contexts. Individuals that led more whilst shoaling, but not foraging, were more likely to reach the stimulus first and consume food rewards. Despite the assays and sequential presentations being temporally close, repeatability among groups and individuals was low. These results suggest that although collective decision making over sequential decisions is affected by some measures of recent behaviour, it is difficult to predict.

Evaluating the cephalic index as a measure of head shape variation in dogs using geometric morphometric methods

Zsófia Bognár¹, Kálmán Czeibert^{2,3}, Gergely Nagy⁴, Tamás Faragó¹

¹BARKS Lab, Department of Ethology, ELTE Eötvös Loránd University, Budapest, Hungary

²Department of Ethology, ELTE Eötvös Loránd University, Budapest, Hungary

³LimesVet Ltd, Budapest, Hungary

⁴Evolutionary Ecology Research Group, Institute of Ecology and Botany, HUN-REN Centre for Ecological Research, Vácrátót, Hungary

The variation in head shape observed among dog breeds is unique within the animal kingdom. The most common metric used to study associations between head shape and neurological/behavioural traits is the cephalic index (the ratio of head width to head length). But is it really a good candidate for describing variation in head morphology? High-resolution computed tomography (a 3D imaging technique) was used to scan 392 dog skulls representing 150 breeds. On each skull, 26 craniometric landmarks were identified. First, we removed the non-shape information from landmark coordinates with Generalized Procrustes Analysis (GPA). Then, we used Residual Randomization Permutation Procedure with Ordinary Least-Squares Estimation to analyse the variance of the GPA standardized shape data. Results showed allometry in head shape variance, also association between overall head morphology and both cephalic index and breed function. Findings supported that cephalic index captures variation in head shape reasonably well. As it is easy to measure in live dogs and even from photographs, its use in ethological and neurological studies is suggested when examining the associations with head shape.

OKAAPI - a new approach for understanding animal social structures

Josefine Bohr Brask¹, Lauren Brent², Delphine De Moor³

¹University of Copenhagen, Denmark

²University of Exeter, United Kingdom

³Max Planck Institute for Evolutionary Anthropology, Germany

Social network structures play a key role in animal lives, as they affect fitness and the spread of disease and information. Understanding these structures is therefore important for understanding animal sociality and conserving populations. Generative network models – algorithms that build simulated networks – are a key approach for investigating the emergence and consequences of social networks. However, generative network modelling tools aimed at the animal behaviour field have been very limited. We have developed a new R package, called 'okaapi', which provides tools for generating, visualizing, and quantifying networks that are based on a key process of real animal social networks, namely trait preferences. Trait preferences are behaviours where individuals prefer social partners that have specific characteristics, such as their own sex, or old age. Trait preferences play a central role for the structuring of social networks. The okaapi package provides a general and flexible method for generating networks based on trait preferences, and can also be used with empirical data. The package therefore has broad applications and can be used to study social structures of many different species, and it has already helped us gain new insights into animal societies. I will give a guided tour of the package, explain its modelling framework, and present results from studies where it has been used.

Coordination and communication of cooperative offspring care behaviour (babysitting) in meerkats

Doli Borah, Marta Manser
University of Zurich, Switzerland

In group-living animals, coordination is essential for maintaining cooperation and depends on effective information flow within social units. In this study, I investigate the communicative mechanisms underlying the coordination of pup care behaviour in the cooperatively breeding Kalahari meerkats (*Suricata suricatta*), by examining how acoustic, visual and spatial information contribute to the coordination of babysitting behaviour. I carried out full-group collaring by deploying biologging-collars equipped with audio, GPS and accelerometer on all individuals across multiple meerkat groups. These data provide the opportunity to capture all vocalizations produced by babysitters and non-babysitters, as well as their movements during babysitting periods. Additionally, I also conducted playback experiments to examine how foraging individuals adjust their vigilance, movement decisions and return probability in response to acoustic cues from the supposed babysitter. By linking individual-level vocal, spatial and visual behaviour to group-level patterns of babysitting, this study provides insight into how meerkats integrate multimodal information to coordinate offspring care and more broadly illustrates how communication supports stable cooperation in animal societies.

Social factors do not influence helping behaviour in pigs

Marie Bordes¹, Kaleiah Schiller¹, Alvaro L. Caicoya², Liza R. Moscovice², Jean-Loup Rault¹

¹Animal Welfare Science Unit, University of Veterinary Medicine, Vienna (Vetmeduni Vienna), Veterinärplatz 1, 1210 Vienna, Austria

²Psychophysiology Working Group, Research Institute for Farm Animal Biology (FBN), 18196 Dummerstorf, Mecklenburg-Vorpommern, Germany

Helping behaviour, a form of prosocial behaviour, occurs when an individual assists another to reach an otherwise unachievable goal. Pigs have shown the ability to engage in helping behaviour by releasing a trapped conspecific from a compartment attached to their home pen. Using this group-testing paradigm, we investigated whether pigs' latency to help was influenced by their gregariousness (i.e., general sociability), their affiliative relationship strength and relative dominance rank difference with the trapped pig. We tested 24 groups of 10 pigs at two different research laboratories, with each pig being trapped once. Relative dominance rank difference was assessed over three days after weaning into new social groups. Gregariousness and affiliative relationship strength were assessed based on whom pigs chose to lie down next to in the week before helping trials, after pigs have been housed together for approximately three weeks. Affiliative relationship strength was directed (actor and receiver) to account for asymmetries between partners. Our results showed no significant effect of gregariousness ($\beta = -0.01$, $p = 0.912$), affiliative relationship strength ($\beta = -0.16$, $p = 0.207$), or relative dominance rank difference with the trapped pig ($\beta = 0.13$, $p = 0.314$) on latency to help. Hence, none of the social factors investigated in this study could predict helping latencies.

Anthropogenic disturbance predicts shorter flight initiation distances but is not associated with short-term habituation or sensitisation

Khawla Bouali, Grant McDonald, András Kosztolányi, Tamás Székely
Department of Zoology and Human Biology, University of Debrecen, Hungary

Coastal breeding habitats of ground-nesting shorebirds are increasingly threatened by anthropogenic activities, placing immense pressure on populations in fragile ecosystems. This study investigates how a genetically unique island population of Kentish Plovers (*Charadrius alexandrinus*) adjusts its behavioural responses to a gradient of disturbance intensity—high, moderate, and minimal on Maio Island, Cabo Verde. Data were collected over two breeding seasons (2024 and 2025). We conducted a total of 108 standardized transect surveys to quantify disturbance frequency from livestock, humans, and vehicles. To assess behavioural plasticity, we performed repeated short-term Flight Initiation Distance (FID) trials ($n = 39$ nests) and monitored parental return times to the nest. Preliminary analysis reveals high individual consistency in behaviour. FID repeatability was significant ($R = 0.82$, $p < 0.001$), indicating that individuals maintain stable flight-response thresholds. Similarly, return times showed strong individual consistency ($R = 0.79$, $p < 0.001$). Currently, linear mixed models (LMMs) are being employed to determine whether these consistent behaviours lean toward habituation (decreased response over time) or sensitization (increased sensitivity) across the disturbance gradient. We expect to demonstrate that behavioural plasticity is site-dependent, with birds in high-disturbance areas showing increased tolerance to human presence compared to those in undisturbed sites. These findings underscore the need for conservation strategies that account for both individual behavioural variation and localized anthropogenic pressures to support the resilience of ground-nesting shorebirds in island ecosystems.

Maternal and environmental effects on infant spatial development in wild chacma baboons

Alanna Brownell¹, Christopher Young¹, Annika Paukner¹, Tony Weingrill², Richard McFarland¹

¹Nottingham Trent University, United Kingdom

²University of Zurich, Switzerland

Maternal and ecological factors can impact infant development in primates, yet few studies have examined how they jointly shape independence trajectories in the wild. Here, we test their relative contributions to infant spatial development in wild chacma baboons using data from 41 mother-infant pairs at the Swebeswebe Wildlife Estate, South Africa.

Spatial independence was quantified monthly (0–36 months) as the proportion of observations infants were >5 m from their mothers. Bayesian GLMMs were used to model variation in independence as a function of infant age, sex, maternal behaviour, and ecological conditions. Early-life conditions were measured by averaging predictors across the first 6 months.

Spatial independence increased with age, with infants averaging 32% of observations >5 m from their mothers at 6 months, rising to 77% by 12 months, but was lower under higher food availability and when mothers carried and affiliated with them more. Early-life conditions did not predict independence at later ages.

These findings suggest maternal and ecological conditions shape proximate, but not long-term, spatial independence, highlighting the need to distinguish between these processes.

Measuring relaxation during grooming in Barbary macaques using contact-free infrared thermography

Carina Bruchmann, Oliver Schülke, Julia Ostner

Department of Behavioral Ecology, University of Göttingen, Kellnerweg 6, 37077 Göttingen, Germany

Social Evolution in Primates Group, German Primate Center, Leibniz Institute for Primate Research, Kellnerweg 4, 37077 Göttingen, Germany

Allogrooming in primates serves not only hygienic functions but also strengthens social bonds, which are linked to increased longevity and reproductive success. Grooming is intrinsically rewarding, reducing stress via lowered heart rate and cortisol levels. Similar calming effects are observed not only in domesticated species during human contact but also in rhesus monkeys after being groomed by a familiar experimenter. While past studies used ECG or hormone assays, recent advances in non-invasive infrared thermography (IRT) allow real-time assessment of arousal via skin temperature changes. IRT is well established to measure arousal in response to stress, but its application to positive stimuli, for instance stroking in goats, is still rare. Here, we investigate the relaxing effects of grooming in free-ranging Barbary macaques ($n = 71$) at Affenberg Salem using IRT. We analyse nose temperature changes across baseline, grooming, and recovery phases, hypothesizing a temperature increase during grooming indicative of relaxation. Preliminary data support this expectation. We further assess how grooming direction (recipient vs. donor) modulates thermal responses. This study is the first to apply IRT to naturally occurring grooming in free-ranging primates, enhancing ecological validity and offering new insights into the physiological effects of social bonding in natural settings.

Give me a ride? Large between-individual but consistent within-individual variation in ravens' use of wild boars

Thomas Bugnyar, Silvia Damini, Emil Isaksson, Petra Sumasgutner
University of Vienna, Austria

Scavengers regularly encounter other species at foraging. While some avoid heterospecifics, others actively seek them as facilitators to, or providers of, resources. Ravens (*Corvus corax*) are renowned for their interactions with predators like wolves; they are also reported to interact with captive omni- and herbivores at foraging, e.g. by riding on their back. To date, there are no systematic studies investigating these latter interactions on an individual level. We here present data from a long-term study on free-Range use ravens foraging daily at the enclosure of wild boars in the Cumberland Wildpark, Austria. Focusing on three data sets collected over 30 years (1997, 2008, 2020), we examined the riding patterns of 174 marked individuals, testing possible effects of age and sex. We hypothesized that riding could be i) a playful activity exhibited mainly by young birds, ii) a foraging strategy exhibited by (older) birds of either sex, or iii) a show-off activity exhibited mainly by (older) males. Our findings reveal hardly any effects of age and sex, but a strong effect of individuality. In each study period, there were some 'riding specialists' with high consistency in using boars; some 'riding opportunists' that facultatively rode boars; and a large proportion of ravens that were never observed to ride boars. We discuss our findings in relation to concepts of personality and social competence.

Eavesdropping on migration: insights from a continent-wide acoustic monitoring network

Madison Bygrove, Natalie Emerick, Dan Mennill
University of Windsor

Billions of birds migrate across the world each year, yet much of this movement happens unseen in the night sky. Many migratory birds produce short, species-specific nocturnal flight calls while in flight, offering a powerful, non-invasive way to study migration. The environmental and geographic factors shaping flight call activity remain poorly understood, despite the urgent need for improved monitoring as migratory bird populations decline. To explore these patterns, we launched a Canada-wide network of autonomous acoustic recorders—Motus Audio—to track flight calls across diverse landscapes and flyways. Using this network, we tested how flight call activity varies with habitat fragmentation, artificial light, and latitude and whether the timing and magnitude of calls reflect broad seasonal and nightly migration patterns. By linking flight call behaviour to environmental conditions, our research reveals how migratory birds interact with human-altered landscapes in real time. A deeper understanding of the factors shaping flight call behaviour helps us predict migratory movements, identify high-risk areas, and guide conservation strategies to protect nocturnally migrating birds.

Socio-cognitive development of pigs in diverging housing conditions

Erick Cabrera Vasquez¹, Coralie Galvagnon², Fabio Pertille³, Carlos Guerrero-Bosagna³, Sarah M. Brown⁴, Irene Camerlink²

¹University of California Davis, United States of America

²Institute of Genetics and Animal Biotechnology of the Polish Academy of Sciences, Poland

³Uppsala University, Sweden

⁴Edinburgh University, United Kingdom

More complex environments may enhance cognitive development. We investigated socio-cognitive differences of pigs (*Sus scrofa*) housed in diverging environments. Juvenile pigs (n=22), housed in either barren (B) or enriched (E) conditions, were studied in tests related to intra- and inter specific social cognition, spatial cognition, and cognitive strategies. Five major brain regions were analysed for DNA methylation to assess epigenetic profiles. In a sow-piglet foraging test, E pigs oriented more often to the sow and foraged less long. However, in a foraging paradigm with a human, E pigs oriented less long to the human than B pigs. In a spatial holeboard task, housing conditions did not influence reference memory or working memory, but B pigs had a more consistent strategy in obtaining rewards by using more stable spatial patterns. Pigs from enriched environments had a higher epigenetic variability in the nucleus accumbens, hippocampus, frontal cortex and hypothalamus, suggesting increased epigenetic plasticity. The differences imply that testing across socio-cognitive domains supports a better understanding of the widespread implications of human-designed environments.

Artificial light at night alters earthworm behaviour and soil processes

Jiaqing Cai¹, Jonathan Bennie², Kevin J. Gaston¹

¹Environment and Sustainability Institute, University of Exeter, Penryn, Cornwall, TR10 9FE, United Kingdom

²Centre for Geography and Environmental Science, University of Exeter, Penryn, Cornwall, TR10 9FE, United Kingdom

Artificial light at night (ALAN) is increasingly recognised as a disruptor of biological rhythms, yet responses of soil fauna that forage aboveground at night remain poorly understood. We investigated how ALAN (20 lx) influences nighttime and crepuscular surface activity (overall, pre-surfacing activity, foraging, and over-surface exploration) in the earthworm *Lumbricus terrestris* under controlled glasshouse conditions, with implications for soil functioning. We found that ALAN significantly altered *L. terrestris* behavioural patterns relative to naturally-lit conditions: nocturnal foraging and surface exploration declined (-40.8% and -65.9%), whilst pre-surfacing activity increased (+137.7%). In contrast, activity during crepuscular periods, particularly at sunset, was markedly elevated (+347.8%). These behavioural shifts were linked to changes in soil processes, including enhanced litter removal into upper soil layers (+112.4 %) and reduced litter consumption (-32.3 %), alongside redistribution of soil aggregates. These findings demonstrate the extensive reach of ALAN, with effects on earthworms and the soil processes they regulate mediated through behavioural pathways. We also observed behavioural flexibility in *L. terrestris* in response to light, suggesting potential early-stage light-driven adaptation that warrants further investigation.

Behavioural responses to artificial-light-at-night: ecological and evolutionary consequences

Ulrika Candolin

University of Helsinki, Finland

Artificial light at night (ALAN) is a growing global problem that influences the composition and functioning of ecosystems by altering the behaviour of organisms. In this talk I will explain the factors that determine how an individual responds, and what the consequences of the responses are, from the individual to the ecosystem level. I will further discuss the potential of species to genetically adapt to light pollution and the research done to investigate this. To illustrate the topic, I will use examples from our work on glow-worms, gammarids, and stickleback. I will present results from a literature search that reveals that although an increasing number of studies find light pollution to alter the behaviour of organisms, the fitness consequences of these behavioural responses are still largely unknown, as are their impacts on populations, communities, and ecosystems. I will end with indicating topics particularly in need of more research.

Effects of noise on Pacific sand lance *Ammodytes personatus* with implications for their avian predators

Nora V Carlson^{1,2}, Meredith Anne Vaillancourt White¹, Jose Tavera³, Patrick D O'Hara^{1,5}, Matthew R Baker^{6,7}, Douglas F Bertram⁵, Adam Summers⁷, David A Fifield⁸, Francis Juanes¹

¹University of Victoria, Victoria, Canada

²University of Tokyo, RCAST, Tokyo, Japan

³Universidad del Valle, Ciudad Universitaria Meléndez, Colombia

⁴University of Victoria, Victoria, Canada

⁵Environment and Climate Change Canada, Integrated Marine Spatial Ecology Lab, Institute of Ocean Sciences, Sidney, Canada

⁶NOAA Alaska Fisheries Science Center, Anchorage, USA

⁷University of Washington, Friday Harbor Laboratories, Friday Harbor, USA

⁸Wildlife Research Division, Science and Technology Branch, Environment and Climate Change Canada, Mount Pearl, Canada

As anthropogenic noise continues to grow throughout the ocean its effects on fish have become a concern as they are economically and ecologically important. Forage fish, as they often play a central role in transferring energy from lower to higher trophic levels in the marine food web, are a critical resource for many species. However, while noise is known to have negative effects on many fish species, information about how noise affects forage fish condition and behaviour remains scarce. Research suggests that noise affects both the behaviour (availability) and condition (quality) of forage fish like Pacific sand lance, *Ammodytes personatus*. Pacific sand lance (PSL) are unique as they bury in the sand both short- and long-term making them unavailable to predators. To understand how noise affects PSL quality and availability as prey in summer, and if winter dormancy buffers them against potential effects, we captured PSL and exposed them to anthropogenic noise. We found that fish in control conditions were generally higher quality. These results suggest that noise may indirectly affect the seabirds that rely on these fish by lowering PSL quality and altering their availability.

Local wildlife management systems as opportunities for reptile behavioural research

Francesca Maura Cassola¹, Anna Wilkinson², Sergio Padilla Paz³, Mauricio González Jáuregui³, Marisol Buenfil⁴, Yann Henaut⁵, Claudia A.F. Wascher¹

¹Centre for Ecology, Evolution and the Environment, Anglia Ruskin University, Cambridge, United Kingdom

²University of Lincoln, Lincoln, UK

³Universidad Autónoma de Campeche, Campeche, México

⁴Ehime University, Matsuyama, Japan

⁵El Colegio de la Frontera Sur, Chetumal, México

Reptile behavioural research is often limited by practical factors that influence study design and the validity of conclusions. Large, cryptic, rare or elusive species are particularly challenging to study in the wild, as low sighting probabilities and logistical constraints often preclude adequate sample sizes. Similarly, universities and research centres rarely have the facilities necessary to maintain such species, and collaborations with zoos, aquaria, or sanctuaries do not always provide enough individuals for rigorous study. In this talk, I will discuss how local wildlife management systems can help overcome these limitations, using Mexican UMAs (Unidades de Manejo para la Conservación de la Vida Silvestre) within the EvOCRO project (Evolutionary Origins of Cognition in Crocodiles) as a case study. I argue that these centres can facilitate more feasible, comparative, and ecologically relevant behavioural research on crocodilians by providing access to more individuals without requiring repeated capture from the wild. More generally, this highlights the importance of identifying similar local infrastructures worldwide to advance research on animal behaviour.

Horns and harvests: understanding gaur (*Bos gaurus*) behaviour in the human-dominated landscape of South India

Monika Chandrashekar¹, Kavita Isvaran², Divya Mudappa³

¹National Centre for Biological Sciences, India

²Centre for Ecological Studies, Indian Institute of Sciences, India

³Nature Conservation Foundation, India

Large-scale deforestation in tropical rainforests for the expansion of the plantations of tea and coffee pushing wildlife to use these novel habitats. Gaur (*Bos gaurus*) is a forest living, mega-herbivore with a population decline of 30%. In the Western Ghats of India, Gaur are navigating these plantations with regular interactions with humans and shaping the lives of both these species. Here, (a) to understand the habitat preferences of gaur by examining their use of different habitats; (b) to investigate the behaviours exhibited by gaur within the different habitats to evaluate the contribution of these habitat types to resource use and risk associated with it? We conducted 323 hours of instantaneous scan sampling for four herds, and 392 focal observations for vigilance distributing evenly across the Organic tea plantations, conventional tea plantations, swamp, and coffee plantations. Gaur utilizes all habitats in the landscape, but swamps appear to be preferred, with behavioural observations confirming that grazing is highest in these areas. The forage availability seems to drive these choices. Vigilance was highest in organic tea plantations and it decreased with the increasing herd size.

Humans as indirect facilitators of a mammal-mammal cleaning symbiosis

Leela Channer¹, Onismus Bwambale², Francis Mwanguhya², Michael Cant¹

¹University of Exeter; United Kingdom

²Banded Mongoose Research Project

Cleaning symbioses are among the most striking examples of cooperation between species, involving the reciprocal exchange of food for hygiene services. Such interactions are widely documented among coral-reef fishes and between birds and herbivores. By contrast, cleaning among mammals is rare and restricted to a few anecdotal examples. Here, we report a cleaning mutualism between common warthogs (*Phacochoerus africanus*) and banded mongooses (*Mungos mungo*), which occurs routinely within a long-term study population in Uganda. Over 30 years, this cleaning mutualism has only ever been observed in one village-dwelling mongoose pack. Using road transect surveys and flight initiation distance trials, we tested whether the emergence of this relationship is explained by warthog abundance, habituation, or both. We found a significant positive relationship between where cleaning occurs and both warthog abundance and habituation, and that these were in turn positively related to proximity to the village centre. These results suggest that warthogs benefit from human presence, which likely offers a shielding effect from predation risks, such that greater numbers of more habituated warthogs enabled mongooses near the village to develop and sustain this cleaning relationship, with humans thus indirectly driving the evolution of an interspecific cooperative interaction.

Social behaviour of the critically endangered *Propithecus coquereli* in a human-modified landscape, northwestern Madagascar

Coral Chell^{1,2}, Hanitriniaina Raharirinina³, Sylvanah Rabesahala³, Shawn M. Lehman¹

¹Department of Anthropology, University of Toronto, Toronto, Ontario, Canada

²School of the Environment, University of Toronto, Ontario, Canada

³Mention Zoologie et Biodiversité Animale, Université d'Antananarivo, Antananarivo 101, Madagascar

Anthropogenic disturbance can generate ecological pressures on animals. Some primate species can adapt to land-use changes by changing the occurrence and rates of their social behaviour. Currently, we have few data on how *P. Coquereli*, a critically endangered lemur, responds to anthropogenic habitat disturbance. We investigated how social behaviour in the *P. coquereli* varied across a heterogeneous human-modified landscape of Mariarano. We conducted behavioural day-follows on five groups: three occupying anthropogenically disturbed habitats and two occupying undisturbed forest habitats. Social behavioural data were collected following a 20-minute continuous focal sampling protocol for 180 days. Differences in play, huddling, grooming, aggression and scent marking behaviours were calculated between disturbed and undisturbed habitats. Groups occupying disturbed habitats spent significantly more time performing allo-grooming behaviour, significantly less time huddling, and were the only groups to perform play behaviour. There were no significant differences in the occurrence of aggression and scent marking, however group differences may exist. These results suggest sifakas are likely adapting their behaviour in anthropogenic habitats. Our research is a key component to understanding how this species persists in human-dominated landscapes.

Chimpanzee movement and Range use responses to recurrent wildfire in the Issa Valley, Tanzania

Julian A. Chhatralia¹, Joram L. Navaya², Fiona A. Stewart^{1,2,3}, Alex K. Piel^{1,2,3}

¹Department of Anthropology, University College London, London, United Kingdom

²Greater Mahale Ecosystem Research and Conservation Project, Mpanda, Tanzania

³Department of Human Origins, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

Increasingly intense and anthropogenic fire regimes represent a growing source of ecological disturbance, yet their effects on wildlife, and particularly primates, remain understudied. We analysed spatial and behavioural data from a community of wild chimpanzees (*Pan troglodytes schweinfurthii*) in the seasonally fire-prone miombo woodland environment of Issa Valley, Tanzania, collected over four dry seasons (2022–2025), to determine how increasing landscape burn extent affected movement and Range use patterns. Chimpanzee Range use contracted with increasing burn, while core area overlap with burned habitat initially declined before converging with total burn extent once ~40% of the landscape was burned. Vegetation preference between woodland and riparian forest remained stable, however travel speeds were slower within burned patches and travel distances reduced with greater landscape burn, with chimpanzees travelling more often in burned areas. Our findings shed light on recurrent fire as a dynamic ecological driver shaping chimpanzee movement and space use, with implications for conservation management in fire-prone ecosystems, as well as reconstructions of human evolution.

Foraging through thick and thin: does behavioural flexibility under resource scarcity come at a cost?

Charlotte Christensen¹, Kennedy Sikenkeny², Damien Farine³

¹University of Zurich, Switzerland

²University of Nairobi, Kenya

³Australian National University, Canberra, Australia

Behavioural flexibility is the first line of defence for wild animals against climate change. If behaviour is to become a metric that can be used to assess adaptive capacity of a species or population, long-term tracking of behaviour across environmental conditions and associated fitness outcomes are needed. Foraging is an obvious candidate for long-term monitoring given its undeniable importance to survival and its inherent trade-offs. Animals must eat to survive, but foraging can also increase predation risk and exposure to inclement weather. Here, we present long-term data from a population of vulturine guineafowl (*Acrylium vulturinum*) in Laikipia, Kenya. The birds are fitted with solar-powered tags recording daily accelerometer data used to quantify foraging effort. First, we show that individuals increase foraging effort as conditions dry up despite higher environmental temperatures. This uptick in foraging does not appear to compensate for the lack of food, as the birds, and females in particular, lose body weight. Second, we show that higher foraging effort predicts predation likelihood. Taken together, ramping up foraging effort during food scarcity is associated with both sublethal (weight loss) and lethal (predation) costs. Balancing foraging trade-offs will become more challenging as conditions aridify, presenting a potential barrier for population viability.

Socially situated physical cognition: theoretical and methodological reasons to test skills within groups

Fay Clark

University of Bristol, United Kingdom

Researchers in animal cognition who study captive populations frequently avoid social testing, defined as assessing physical cognitive abilities in the presence of conspecifics. Concerns include task monopolisation by dominant individuals, exclusion of subordinates, difficulty attributing task solutions to specific individuals during group interactions, and challenges in identifying social learning processes. In this keynote, I will show that, despite these limitations, social testing of physical cognition is both feasible and valuable in zoo-housed animals. I will present findings from associative learning, innovation, and cognitive enrichment studies conducted with chimpanzees, gorillas, lemurs, dolphins, and ratite birds. I argue that because zoo animals already experience constrained or atypical social environments, exclusively asocial testing further diminishes ecological validity.

The sound of fear: mapping perceived predation risk from wild meerkat's alarm calls

Zachary Cloutier¹, Jack Thorley², Dominik Behr³, Tim Clutton-Brock⁴, Marta Manser¹, Arpat Ozgul¹

¹University of Zurich, Zurich, Switzerland

²British Trust for Ornithology, Norfolk, United Kingdom

³Monash University, Merlbourne, Australia

⁴Cambridge University, United Kingdom

Animals adjust their behaviour based on how they perceive predation risk in their environment. However, little is known about how this perceived risk varies across time and space in multi-predator ecosystems, as current methods do not directly measure how prey experience danger. Alarm calling in social species can serve as a powerful tool for mapping perceived predation risk. Because alarm calls are produced in response to danger they may provide a more direct measure of how animals perceive risk than typical proxies. Here, we used 22 years of alarm call data from 47 wild but habituated meerkat (*Suricata suricatta*) groups in the Southern Kalahari, South Africa, to estimate spatiotemporal variation in perceived predation risk and its ecological and social drivers. Meerkats are ideal to study the ecology of fear, because they face a wide array of predators in highly seasonal and heterogeneous environments, where both perceived and actual predation risk likely change widely. Their diverse alarm call repertoire provides a direct measure of their risk perception. We fitted resource selection functions and allowed effects to vary among groups. This study shows that alarm calling can provide a direct behavioural readout of perceived predation risk, addressing a key criticism of landscape-of-fear approaches that predator presence does not necessarily equal perceived risk.

The potential effect of islands on the innovative abilities of corella cockatoos

Jennifer A. D. Colbourne¹, Mark O'Hara¹, Özge Nasa¹, Joelle K. Colbourne¹, Anna Wilkinson², Alice M. I. Auersperg¹

¹University of Veterinary Medicine Vienna, Austria

²University of Lincoln, United Kingdom

The Tanimbar corella, also known as the Goffin's cockatoo (*Cacatua goffiniana*), has become a model avian species for problem solving, in large part due to their unique ability to flexibly manufacture and use tools. Like most wild tool-using birds, the Tanimbar corellas inhabit islands, which have been suggested to contribute to the emergence of tool use. However, little is known about the innovative potential of the other members of the corella family. Therefore, we used a multi-access box to compare the Tanimbar corella to another species of island-dwelling corella, the Solomon's corella (*Cacatua ducorpsii*), as well as a species that evolved on the mainland of Australia (the little corella, *Cacatua sanguinea*). The multi-access box has one reward that can be obtained by innovating six different solutions, each of which has distinct physical requirements (including two which require the use of objects/tools). Once one solution is repeatedly used, it is subsequently blocked, forcing the corella to try something new. We can thus examine differences in flexibility, as well as problem-solving ability, by comparing species-specific strategies of performance on the box.

Behavioural impacts of reductions in group size in a social fish

Daisy Cooper, James Herbert-Read
University of Cambridge, United Kingdom

Anthropogenic impacts in marine environments, including fisheries that selectively target large aggregations and habitat fragmentation, can disrupt fish schooling behaviour and reduce school size. The magnitude of the behavioural consequences, however, of these reductions in group size remains poorly understood. Sandeels (*Ammodytes tobianus*) are an ecologically important fish species native to the UK, which serve as an important prey source for several vulnerable seabird species, and simultaneously face pressure from both commercial fisheries and habitat fragmentation. To investigate how predicted reductions in school size may affect sandeel behaviour, we experimentally manipulated group size and measured (i) individual risk-taking propensity, which determines vulnerability to predation, and (ii) decision-making speed, which determines the ability to exploit temporally restricted food resources. Our results show that decreases in group size lead to decreases in both risk-taking and decision-making abilities, with effects that frequently exceed what would be predicted from the magnitude of the reduction in group size alone. This suggests that human-driven reductions in school size could be an under-considered, yet highly consequential, anthropogenic impact especially prevalent for social fish.

Effects of temperature, social context and metabolic rate on learning in a social freshwater fish

Daphne Cortese¹, Amelia Munson², Aurelio Cortese³, Cheng Fu⁴, Nick AR Jones⁵, Bowen Li⁶, Oluwaseun Christianah Ojelade⁷, Shaun Killen⁶

¹Leibniz Institute for Freshwater Ecology and Inland Fisheries, Germany

²Department of Wildlife, Fish and Environmental Studies, Swedish University of Agricultural Sciences, Umeå, 90736, Sweden

³Department of Brain Science Engineering, Sungkyunkwan University, Korea

⁴Laboratory of Evolutionary Physiology and Behavior, Chongqing Key Laboratory of Conservation and Utilization of Freshwater Fishes, Chongqing Normal University, Chongqing, 401331, China

⁵Department of Animal Physiology, University of Bayreuth, Bayreuth, Germany

⁶School of Biodiversity, One Health and Veterinary Medicine, University of Glasgow, Glasgow, G12 8QQ, United Kingdom

⁷Department of Aquaculture and Fisheries Management, Federal University of Agriculture, Abeokuta, Ogun, Nigeria

Animals must find food resources to meet energetic demands for growth and survival. Social learning may increase foraging success though information gained from conspecifics. However, the benefits of social learning may vary with environmental conditions, particularly in the context of climate warming. Here, we studied the learning abilities of wild-caught European minnows *Phoxinus phoxinus* trained alone or in groups of four for 20 days to locate a food reward in a maze. Fish were then tested individually on day 21. They were acclimated, trained and tested at either 14°C (n = 15 groups, n = 18 individuals) or 20°C (n = 17 groups, n = 18 individuals); metabolic rate was measured at the end of the experiment. We found that success probability to locate the reward increased over training, with higher success and shorter latency at warmer temperatures. Fish trained in groups outperformed individuals, particularly at 20°C, where latency to find the reward during training was lower for fish trained in a group. However, the effects were less clear in individual testing on the 21st day. While metabolism increased at 20°C, success probability was marginally negatively related to fish metabolic rate. These results may reflect enhanced learning and differences in the motivation to find the reward across treatments, potentially linked to increased energetic demands at higher temperature and increased competition in group settings.

The effects of artificial light on the swimming capacity of migratory three-spined sticklebacks

Danielle M Crowley, Hans Slabbekoorn, Christian Tudorache
Institute Biology Leiden University, The Netherlands

Light plays a key role in the functioning of many behavioural and physiological patterns in fish. However, light follows daily and seasonal rhythms in which the duration and intensity changes, meaning fish must rely on the biological clock's "connection" to the external environment to interpret and respond to changes. Dependency on rhythms raises concerns for the impact of light pollution on the biological clock as it may disrupt these rhythms, negatively impacting behaviour and physiology. This is concerning for migratory fish as natural cues related to migration may be masked, influencing energy expenditure and migration success. Using field and lab studies, we investigate the short-term consequences of light on swimming physiology and behaviour of three-spined sticklebacks.

Heatwaves have sex-specific effects on the reproduction of the nuptial feeding spider

Anita Curti, Mattia Bolognesi, Cristina Tuni
University of Turin, Italy

Heatwaves are becoming more intense and frequent over time, posing a serious threat to arthropods due to their limited thermoregulatory capacity. While temperature effects on insect reproduction have received growing attention, spiders remain understudied. In the spider species *Pisaura mirabilis*, knowledge on the effects of temperature on its mating behaviour is lacking. We therefore investigated the sex-specific impact of simulated heatwaves on its reproductive behaviour and fitness with the prediction that thermal stress would negatively affect mating success and reproductive output. In two distinct studies, males and females were exposed to a 5-day heatwave of 36°C or kept in control conditions at 20°C, and were subsequently paired with an untreated opposite sex individual. We measured changes in body mass, behavioural interactions during mating trials and fitness outcomes of each pairing. Results show that males that experienced a heatwave partially suffer from fitness loss, but thermal stress did not affect their mating behaviours and body mass. In contrast, females lost more weight after the heatwave compared to control females. Copulation duration was longer in pairs with heat-treated females, but of these, none produced viable offspring. In conclusion, this study suggests that elevated temperatures may have an impact on certain aspects of spider physiology and reproduction.

The function of multimodal courtship in king penguins

Noa Danthony¹, Francesco Bonadonna¹, Leonida Fusani^{2,3}, Celine Le Bohec^{1,4}

¹CEFE, Université de Montpellier, CNRS, EPHE, IRD, Montpellier, France;

²Department of Behavioral and Cognitive Biology, University of Vienna, Austria

³Konrad Lorenz Institute of Ethology, University of Veterinary Medicine, Vienna, Austria

⁴Centre Scientifique de Monaco, Département de Biologie Polaire, Monaco

Mate selection is one of the most important fitness-bearing decisions animals make and the main drivers of the evolution of sexual behaviours and secondary sexual traits. Complex courtship displays often associated with elaborate ornamentation are thus widespread across species. In king penguins, biparental investment is necessary to rear a chick, and strong environmental constraints make the evolution of a mutual, informative courtship particularly important. King penguins exhibit elaborate multimodal courtship displays including synchronised movements, coloured ornaments, and calls. These displays provide an opportunity to examine how multiple signals shape pair formation, pair bonds, and reproductive success. In this study on Kerguelen Island, during the courtship phase, we conducted focal video recordings and spectrophotometric measurements of ornaments' coloration and contrast. Using deep-learning computer-vision methods, we quantify partner movements synchrony within pairs. We hypothesise that higher courtship quality - characterised by stronger behavioural synchrony and greater ornament contrast - will be associated with higher reproductive success and more stable pair bonds, as suggested by our preliminary analyses. Together, these results will help clarify how multiple courtship signals interact to shape pair formation and reproductive success in king penguins

The role of food-based enrichment on behaviour and welfare in captive clouded leopards (*Neofelis nebulosa*) and fishing cats (*Prionailurus viverrinus*)

Sandipa Das

Institute of Environment Education & Research, Bharati Vidyapeeth, India

Captive environments often fail to put together the ecological and behavioural complexities of natural habitats, which can lead to abnormal repetitive behaviours and physiological stress in the wild animals they house. The lack of stimulation is even more pronounced when maintaining ecologically specialised species in captivity that require high welfare standards and thus, pose a great challenge for zoos. This study aimed at assessing the effect and role of a species-specific, food-based, spatially dispersed feeding enrichment on the behaviour and welfare of individual felids, belonging to two threatened species—the clouded leopard (*Neofelis nebulosa*) and the fishing cat (*Prionailurus viverrinus*), housed in the Sepahijala Zoological Park, Tripura, in India. Employing a baseline and 'with enrichment' strategy, behavioural data were collected using an ethogram-based, continuous focal sampling. The behavioural responses of the animals were recorded across feeding and non-feeding days in the two-phase study design, while faecal samples were collected to assess the 'Faecal Glucocorticoid Metabolites' (FGM) and analyse the physiological stress. The enrichment intervention involved spatial dispersal of rationed food from routine feeding and led to considerable behavioural shifts. The fishing cat showed a statistically significant increase in active behaviour during both the direct enrichment feeding period and subsequent non-feeding days, while stereotypic pacing was almost reduced in the enrichment period. Both species demonstrated a considerable increase in their exploratory behaviours and a more distributed spatial use of their enclosures throughout the enrichment phase, highlighting the positive and sustained effect of the intervention. The behavioural data reinforces a strong basis of an effective enrichment however, the FGM analysis was deemed inconclusive due to environmental and logistical constraints. Nonetheless, the findings of the study reflect that even a low-cost, simplistic, food-based enrichment strategy, tailored to a species' natural, bio-physical requirements, is a highly effective tool for the improvement of behavioural diversity and welfare. This study, therefore, informs welfare practices, management protocols and provides a strong evidence-based framework for future conservation-oriented programmes and contributes to the scientific literature by filling a significant gap in welfare and enrichment studies regarding small and medium felines, in South Asia and within the Indian zoo context.

Applications of real-time AI for conservation and human-wildlife coexistence

Angela Dassow¹, Arik Kershenbaum², Holly Root-Gutteridge³

¹Carthage College, United States of America

²Girton College, and Department of Zoology, University of Cambridge, United Kingdom

³School of Life Sciences, University of Lincoln, United Kingdom

Automated acoustic tracking has emerged as a powerful, non-invasive approach for monitoring rare and endangered species across diverse and often inaccessible habitats. This talk presents a scalable framework that integrates passive acoustic sensors, machine learning-based signal classification, and spatial localization algorithms to detect and track vocalizing species in real time. We evaluate the system across multiple ecosystems, demonstrating its adaptability to varying soundscapes and background noise conditions. The system achieved high detection accuracy while minimizing false positives, even for species with low call rates or overlapping acoustic signatures. Field deployments reveal that automated acoustic tracking can significantly improve temporal and spatial resolution of species occurrence data compared to traditional survey methods. Furthermore, the approach enables continuous long-term monitoring, offering critical insights into population dynamics, habitat use, and responses to environmental change. Our findings highlight the potential of acoustic monitoring technologies to enhance conservation efforts, particularly for cryptic or elusive species, while reducing the logistical and ethical challenges associated with direct observation.

Does aircraft noise cause hearing impairment in birds?

Selvino de Kort, Sue Anne Zollinger, Leah Harrison, Noah Edensor
Manchester Metropolitan University, United Kingdom

Birds adjust their singing behaviour in response to anthropogenic noise in various ways, presumably to release their songs from masking. Birds may change the timing of song delivery, and they may increase the frequency and/or amplitude of their songs. By contrast, we previously found that chiffchaffs living close to airport runways decrease the frequency of their songs, a seemingly maladaptive response. Here we show that song frequency in chiffchaffs was restored to during Covid lockdowns, when there was a significant decrease in aircraft movements. We also have new data that shows that skylarks that get extremely close to flying aircrafts during their song flight, also show a decrease in frequency in their song. We interpret these results as further strengthening our earlier conclusion that these birds living near airport runways suffer from noise induced hearing loss.

The evolutionary origin of group recruitment in acorn ants

Grant Navid Doering¹, Doğa Keçe¹, Sophie Gerardi², Nobuaki Mizumoto³, Timothy A. Linksvayer²

¹Bilkent University, Turkey

²Arizona State University, United States of America

³Auburn University, United States of America

The communication systems of animals vary greatly in their complexity. Understanding the traits that promote evolutionary transitions to more sophisticated communication systems is a major research goal of evolutionary biology. Acorn ants (genera *Temnothorax* and *Leptothorax*), which utilize a communication method known as tandem running, are valuable as a model clade for studying the evolution of animal communication. Tandem running involves a leader ant directing a follower ant to a location outside the nest. Tandem running relies on bidirectional feedback between leaders and followers, is mediated through physical contact, and can vary in complexity as followers can occasionally form groups of several interacting individuals that pursue the leader. We observed recruitment behaviour across 33 different acorn ant species and, using high resolution ant trajectory data, quantified information flow between leaders and followers and assessed the interaction patterns within tandem groups. We show that acorn ant species exhibit interspecific differences in their tandem running traits, and we assess which behavioural traits have led to the evolution of more complex communication behaviour.

Lunar cycle-driven exploration-exploitation dynamics in wild gerbils

Arik Dorfman, Aziz Subach, Shachaf Avraham, Or Meir Manzur, Gili Kaufmann, Inon Scharf

School of Zoology, George S. Wise Faculty of Life Sciences, Tel Aviv University, 69978 Tel Aviv, Israel

The exploration-exploitation trade-off reflects the balance between using known resources for immediate gain and searching for potentially better options. Stress is known to shift this balance toward exploitation. We tested the prediction that moonlight, a well-known stressor for many prey species, biases this trade-off in wild dune-dwelling gerbils. To this end, we conducted a field experiment where gerbils were presented with two artificial food patches throughout the lunar cycle. Barriers were gradually erected around the first patch discovered to increase exploitation costs and promote exploration of an alternative patch. We found a cyclic pattern: around the full moon, gerbils showed increased vigilance and aggression and delayed exploration and discovery of the second patch compared to darker nights. These results demonstrate that the lunar cycle acts as a stressor, generating predictable monthly shifts in exploration-exploitation dynamics in wild animals. Artificial light at night (ALAN) may disrupt this pattern.

Is sperm the weak link in stress tolerance? Sex differences in the thermal sensitivity of reproduction

Liam Dougherty¹, Graziella Iossa², Rhonda Snook³

¹University of Liverpool, United Kingdom

²University of Lincoln, United Kingdom

³Stockholm University, Sweden

There is a growing realization that heat stress can cause widespread infertility in animals. One outstanding question is whether male and female reproduction is equally vulnerable to heat stress, with male sperm production often thought to be the 'weak link'. Answering this question is crucial if we are to understand the ecological consequences of climate change, because heat stress only needs to cause infertility in one sex to have severe consequences for population viability. We used meta-analysis to quantify sex-biased thermal sensitivity in animals, using published studies that independently exposed males and females to identical test temperatures and recorded subsequent reproduction after mating with unexposed partners. Across 34 studies and 27 species, we found no overall difference in the sensitivity of males or females to heat stress. However, reproduction was more greatly impaired when both sexes experienced stress, compared to when one sex was exposed alone. While neither sex is therefore consistently a 'weak link', simultaneous exposure of both sexes is likely in the wild, and so studies should test for additive effects of heat stress on both sexes when possible.

Context-dependent benefits of extra-pair mating under fluctuating environmental conditions in house sparrows (*Passer domesticus*)

Lucile Doyen, Yu-Hsun Hsu

National Cheng Kung University, Taiwan

In socially monogamous bird species, genetic promiscuity is widespread, with both males and females producing offspring outside of the pair bond. While the benefits of extra-pair mating are well established for males, they remain unclear for females. The good genes hypothesis predicts that females will benefit from extra-pair mating with males of superior genetic quality than their social partner, thereby securing greater genetic benefits for their offspring. However, empirical support for this hypothesis is mixed. In this study, we will explore the context-dependent outcomes of extra-pair mating, where genetic advantages may emerge only under stressful environmental conditions. Using 25 years of genetic parentage and climatic data, we will investigate how thermal stress and environmental predictability influence the outcomes of extra-pair mating in house sparrows (*Passer domesticus*). We predict higher fitness in extra-pair offspring compared to within-pair offspring, but only under stressful environmental conditions. We also expect higher lifetime indirect benefits for females engaging in extra-pair mating under fluctuating and unpredictable environmental conditions, through increased genetic diversity within broods, allowing some offspring to better cope with environmental challenges.

Context-dependent benefits of extra-pair mating under fluctuating environmental conditions in house sparrows (*Passer domesticus*)

Lucile Doyen, Yu-Hsun Hsu
National Cheng Kung University, Taiwan

In socially monogamous bird species, genetic promiscuity is widespread, with both males and females producing offspring outside of the pair bond. While the benefits of extra-pair mating are well established for males, they remain unclear for females. The good genes hypothesis predicts that females will benefit from extra-pair mating with males of superior genetic quality than their social partner, thereby securing greater genetic benefits for their offspring. However, empirical support for this hypothesis is mixed. In this study, we will explore the context-dependent outcomes of extra-pair mating, where genetic advantages may emerge only under stressful environmental conditions. Using 25 years of genetic parentage and climatic data, we will investigate how thermal stress and environmental predictability influence the outcomes of extra-pair mating in house sparrows (*Passer domesticus*). We predict higher fitness in extra-pair offspring compared to within-pair offspring, but only under stressful environmental conditions. We also expect higher lifetime indirect benefits for females engaging in extra-pair mating under fluctuating and unpredictable environmental conditions, through increased genetic diversity within broods, allowing some offspring to better cope with environmental challenges.

Behavioural consequences of heatwaves: moving towards a multi-stressor framework

Luna Dudine, Merel C. Breedveld, Clelia Gasparini
Department of Biology, University of Padua, Italy

Climate change has already led to significant alterations in the global thermal environment, increasing both the intensity and frequency of extreme events such as heatwaves. While the lethal effects of thermal extremes are well documented, sub-lethal consequences remain less understood. Among these effects, it is important to understand the effect on cognition, as it underpins key fitness-related behaviours including foraging efficiency, predator avoidance, and mate choice. Understanding how heatwaves affect cognitive function is therefore essential to predict organismal responses to ongoing climate change. We investigated whether heatwaves affect cognitive traits in male guppies (*Poecilia reticulata*). Heatwave-exposed males showed reduced spatial learning performance, impaired cognitive components of mate choice, and suboptimal antipredator responses, while inhibitory control and habituation were unaffected. Heatwave exposure also induced morphological alterations in the central nervous system, potentially underlying the observed cognitive deficits. Our findings highlight that heatwaves can impair cognitive function through sub-lethal mechanisms, with important consequences for individual fitness beyond survival. Because extreme climatic events such as heatwaves rarely occur in isolation, organisms in natural environments are seldom exposed to a single stressor; rather, they experience multiple stressors that co-occur, and phenotypic responses emerge from their simultaneous and often interacting effects. Building on this framework, the future direction of my PhD research aims to investigate how heatwaves interact with other ecologically relevant stressor (namely food limitation, reduced genetic variability, and pollution) in driving behavioural shifts and shaping cognitive performance.

Human monogamy in mammalian context

Mark Dyble

University of Cambridge, United Kingdom

Monogamy has been argued to have played an important role in human evolution and, across animals more generally, evolutionary transitions to highly cooperative societies have been far more likely to occur in monogamous species, raising the possibility that this may have also been the case for humans. However, the extent to which we can consider monogamy to be the typical human mating system is subject to debate. Here, I provide comparative context on human mating behaviour by comparing the distribution of sibling types (full siblings versus half-siblings) across more than 100 human societies with equivalent data from 34 non-human mammal species. While cross-culturally variable, rates of full siblings in humans cluster closely with rates seen among socially monogamous mammals and fall consistently above the range seen in non-monogamous mammals. Although the human data is demonstrative of considerable cross-cultural diversity in marriage and mating practices, the overall high frequency of full siblings is consistent with the characterization of monogamy as the modal mating system for humans.

Streetlights may decrease predation of ground-based insects

Gregory Eckhardt¹, Graeme Ruxton²

¹University of Birmingham

²University of St Andrews

Artificial light at night (ALAN) is a global driver of behavioural disruption, frequently associated with an attraction effect on insects which has been shown to increase the vulnerability of flying insects to predation. However, the impact of ALAN on the survival of ground-based invertebrates has been less understood. We investigated how LED streetlighting influences predation risk for ground-based insects using artificial prey. Contrary to the expectation that increased visibility would heighten mortality, our results reveal a "light shield" effect: predation rates were significantly lower directly under streetlights compared to further away at lower lux levels at night, but not during the day. This suggests that ALAN may create a low-predation refuge for ground-dwelling invertebrates, possibly due to the avoidance behaviour of nocturnal ground-based predators. These findings highlight a complex trade-off between attraction and survival, suggesting that ALAN fundamentally restructures trophic interactions in urban ecosystems.

Personality differences in locomotory behaviour are locally adapted to edge and core habitats in a wild ground beetle

Stanley A Edwards¹, Gerardo Fracasso¹, Ciaran Harris¹, Michael Grant¹, Jeremy E Niven¹, Claudia Drees^{1,2}, Wiebke Schuett¹

¹School of Life Sciences, University of Sussex, United Kingdom

²Department of Biology, Universität Hamburg, Germany

Whether through anthropogenic or natural processes, habitat fragmentation increases the prevalence of edge habitats. Individuals at edges experience altered environmental conditions compared to habitat cores, yet empirical studies examining behavioural responses to edge effects remain limited. Individuals may respond plastically to these effects, or behaviour may be locally adapted to edges or cores, with consistent behavioural differences indicating personality differences. Using radiotelemetry, we tracked 50 ground beetles at edge and core habitats within a woodland in East Sussex. In a reciprocal transplant design, half of the individuals were moved between sites after a week. Distances walked and the likelihood of initiating movement were repeatable, indicating personality. Beetles at the edge moved shorter distances and were less likely to move than those at cores. These differences persisted after transplantation, suggesting local adaptation to edge or core habitats. Our results further understanding of varying behaviour across fragmented habitats and the mechanisms by which individuals respond to edge effects, helping predict responses to climate change and fragmentation.

Blinded by the light: investigating human influences on migratory birds from a continent-wide acoustic tracking system

Natalie Emerick, Madison Bygrove, Daniel J. Mennill
University of Windsor

Migratory bird species are experiencing population declines globally. Artificial light at night is a growing threat to nocturnally migrating birds, affecting bird behaviour through disorientation and heightened risks of mortality. The flight calls uttered by nocturnal migrants provide a unique opportunity to track bird movements and changes in population trends. We have developed a novel continent-wide microphone array—Motus Audio—to measure bird migration across Canada. Using a novel machine learning algorithm, we identify night flight calls of migrants across Canada and explore how artificial light affects species-specific night flight calling behaviour of birds. By quantifying the influence of artificial light on night flight calling behaviour, we examine how influence of light varies between species and investigate how experience with artificial light alters behaviour. This research uses a large-scale network to shed insight into the pervasive effects of light pollution, helping to inform how targeted strategies can be implemented to protect migratory birds.

Valence or motivation, that is the question - acoustic correlates of emotional and motivational state in dog vocalisations

Tamás Faragó¹, Csenge Reisinger^{1,2}, Dorottya Zaválnij¹, Róza Haraszi¹, Zsófia Bogár¹, Petra Szögi¹, Paula Pérez Fraga¹

¹BARKS Lab, Department of Ethology, ELTE Eötvös Loránd University, Budapest, Hungary

²University of Veterinary Medicine, Budapest, Hungary

Decoding callers' emotional valence (positive/negative) or motivation (non-hostile/hostile) can help listeners respond adaptively in social interactions. How callers encode either valence or motivation has been extensively described, but their combined effects on call structure have not yet been studied. Thus, we recorded 35 dogs' calls, placing each in contexts evoking inner states with different valence-motivation combinations: negative|non-hostile in separation, negative|hostile during threat and positive|non-hostile during play. We analysed 2361 calls' length, pitch- and tonality-related parameters and compared these across the three inner states using generalised linear mixed models. We found that neither valence nor motivation could independently explain the acoustic differences, leading to contradicting results (e.g. both negative and non-hostile sounds having higher pitch, or both positive and hostile calls being less tonal), but their interaction did. This suggests that taking into consideration the combined effect of different aspects of the inner state on vocalisations can lead to a better understanding of acoustic information encoding and ultimately signal evolution.

Hybrid behavioural monitoring in captive Iberian lynx using BORIS and DeepLabCut

Eva Sofia Vilaça Faria^{1,2}, Janeide de Assis Guilherme Padilha¹, Hugo Almeida da Costa Oliveira²

¹University of Minho, Portugal

²Biological Park of Vila Nova de Gaia, Portugal

In captivity, continuous camera-based observation is essential to ensure welfare, especially for vulnerable species such as the Iberian lynx (*Lynx pardinus*), our current case study. This study involves 24-hour video recordings collected during one year. To analyse this data, we will combine behavioural event logging in BORIS with machine learning using DeepLabCut. BORIS is a versatile open-source tool for behavioural annotation, fully customizable, flexible across species and study designs, and easily accessible, but it has its own limitations, such as still being fully manual. While suitable for short-term studies, for studies with 24-hour videos it falls short. DeepLabCut is a free, open-source program that can track individuals across video frames. Although both tools have been used together in rodent studies, their application to felines for this purpose remains unexplored. We expect that DeepLabCut can be used to classify activity states such as active, inactive or not detected, reducing manual workload, as well as human error, so that the event logging procedure is optimized and may serve as a model for future studies.

Discovering the domino effect: how artificial light's impact on individual behaviour can drive ecosystem change

Bridgette Farnworth

Victoria University of Wellington, New Zealand

Artificial light at night (ALAN) is an emerging threat to nocturnal invertebrates. Although ALAN is known to alter the behaviour of individual species, we still have a limited understanding of how these behavioural responses scale up to affect whole communities and ecosystem processes. In this keynote, I explore how ALAN changes ground-dwelling invertebrate communities and disrupts predator-prey interactions. While some insects are attracted to lights, others actively avoid illuminated areas. My research shows that these community responses can reduce prey availability for predators in lit environments. In addition, these behavioural shifts may also affect ecosystem functioning by changing nutrient availability. When prey move away from light, predators experience not only reduced prey densities but also changes in the nutritional quality of their food. Prey movement in response to light is not ecologically neutral but can have wide-reaching consequences for communities and ecosystems. As permanent artificial lighting continues to expand under a 24/7 lifestyle, conservationists urgently need to understand how individual behavioural responses to ALAN translate into ecological change: we need to discover the domino effects.

Is avoidance of human-dominated landscapes in juvenile golden eagles a signature of past human–animal relations?

Louise Faure^{1,2,3}, Yanni Gunnell³, Hester Brønnevik^{1,2}, Enrico Bassi⁴, Martin U. Grüebler⁵, David Jenny⁵, Petra Sumasgutner⁶, Martin Wikelski^{1,2}, Kamran Safi^{1,2}, Elham Nourani^{1,2,7}

¹Max Planck Institute of Animal Behavior, 78315 Radolfzell, Germany

²Department of Biology, University of Konstanz, 78464 Konstanz, Germany

³Environnement ville société, UMR 5600, CNRS, 69007 Lyon, France & Université Lumière Lyon 2, 69676 Bron, France

⁴ERSAF-Direzione Parco Nazionale dello Stelvio, 23100 Bormio (SO), Italy

⁵Swiss Ornithological Institute, CH-6204 Sempach, Switzerland

⁶Konrad Lorenz Research Center (KLF), Core Facility for Behavior and Cognition, Department of Behavioral and Cognitive Biology, University of Vienna, 4645 Grünau/Almtal, Austria

⁷Centre for the Advanced Study of Collective Behaviour, University of Konstanz, 78464 Konstanz, Germany

Behavioural plasticity is both the mechanism through which a single genotype produces different phenotypes in response to environmental variation and as such the outcome of an evolutionary process. The influence of humans on the evolution of behavioural plasticity has only been documented through contemporary interactions, neglecting the long history of human–animal interactions. Because plasticity curtailed by evolution limits the range of adaptive potential under changing environmental conditions, extending our understanding of human–animal relations across time and space is critical to reassess the baselines against which plasticity is evaluated. Using a demographically recovering population of golden eagles (*Aquila chrysaetos*) in the Alps after centuries of persecution, we examined behavioural plasticity toward human-dominated landscapes by testing whether their responses are learned through experience during dispersal or through parental influence during pre-dispersal. A Principal Component Analysis of 18 landscape features used by 64 GNSS-tagged juveniles during pre-dispersal and the first fifteen weeks of dispersal revealed consistent and persistent use of similar landscape features across the two consecutive phases. This suggests that avoidance of human-dominated landscapes results from pre-dispersal learning (or is innate), rather than from experience accumulated during dispersal – potentially also explaining the limited expansion of eagle populations beyond the Alps. Whether a reduced behavioural repertoire reflects an irreversible loss of plasticity through the past selective survival of human-averse individuals or a plastic response culturally transmitted across generations, this work encourages reconstructing the past human–animal interactions under which behavioural repertoires may experience critical bottlenecks.

Humans as social partners? Experience and selection history shape responses in domestic chickens

Vitor H. B. Ferreira¹, Lucille Dumontier¹, Elise Calesse¹, Constance Demion¹, Julie Lemarchand¹, Fabien Cornilleu¹, Auriane Foreau², Maxime Quentin², Maryse Guinebretière³, Vanessa Guesdon⁴, Michèle Tixier-Boichard⁵, Céline Tallet⁶, Xavier Boivin⁷, Léa Lansade¹, Ludovic Calandreau¹

¹INRAE, CNRS, Université de Tours, Centre Val de Loire UMR Physiologie de la Reproduction et des Comportements, Nouzilly, France

²ITAVI, Nouzilly, France

³Epidemiology, Health and Welfare Unit, Ploufragan-Plouzané-Niort Laboratory, French Agency for Food, Environmental and Occupational Health & Safety (ANSES), Ploufragan, France

⁴JUNIA, Comportement Animal et Systèmes d'Élevage, Lille, France

⁵INRAE, AgroParisTech, GABI, Université Paris-Saclay, Jouy-en-Josas, France

⁶PEGASE, INRAE, Institut Agro, Saint-Gilles, France

⁷Université Clermont-Auvergne, INRAE, VetAgro Sup, UMR Herbivores, Saint-Genès-Champanelle, France

Domestication and artificial selection have forced animals to adapt to human-shaped environments. Repeated exposure to humans and selection for specific functions may therefore reshape how animals perceive humans, not only as neutral or negative features, but also as social partners. Yet this remains far less explored in domestic birds than in mammals. Here, we integrated two studies in domestic chickens (*Gallus gallus domesticus*) to examine how experience and selection history influence responses to humans. Birds were tested in separation–reunion paradigms alternating between isolation and exposure to a human or conspecific. Gentle human contact increased calm behaviours in the presence of a familiar human, suggesting that humans can acquire positive social value through experience. Breed comparisons further showed that a commercial strain displayed stronger behavioural modulation to social cues than a heritage breed, which exhibited a more independent strategy. These findings suggest that individual experience and selection history shapes how chickens integrate humans into their social environment, highlighting human–animal interactions as an important dimension of social cognition in a human-dominated world.

Chronic anthropogenic noise degrades acoustic behaviour and reproductive fitness in the two-spotted cricket

Vittorio Ferrero¹, Mario Gallego-Abenza², Oded Berger-Tal³, Cristina Tuni⁴

¹Department of Life Sciences & Systems Biology, University of Turin, Turin, Italy

²Department of Zoology, Stockholm University, Stockholm, Sweden

³Mitrani Department of Desert Ecology, The Jacob Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Be'er Sheva, Israel

⁴Department of Life Sciences & Systems Biology, University of Turin, Turin, Italy

By mediating mating interactions and sexual selection, acoustic communication is a fundamental driver of reproductive success in terrestrial ecosystems. Although the disruption of these networks by anthropogenic noise is well-documented in vertebrates, the impacts on invertebrates, which comprise the base of terrestrial food webs, remain severely understudied. Furthermore, while noise is known to mask signals, it remains unclear whether chronic exposure imposes direct fitness costs, largely because traditional bioacoustic methodologies rely on fragmented, short-term acoustic sampling. Here, focusing on the two-spotted cricket *Gryllus bimaculatus*, we coupled a 14-day controlled traffic noise exposure experiment with subsequent assessments of mating behaviour, sperm quality, reproductive output, and male acoustic signalling. To robustly quantify noise-induced acoustic variation and explicitly evaluate methodological efficacy, we directly compared the analytical outcomes of traditional 5-second manual downsampling against a novel, automated 12-hour continuous extraction pipeline designed to capture whole-night rhythm dynamics. We observed that while chronic noise exposure does not impact male mortality, body mass, or baseline sperm viability, it significantly degrades the macro-scale rhythmic architecture of calling songs. Specifically, noise-exposed males exhibited elongated inter-chirp intervals. These also suffered a severe fitness cost, with noise-exposed males producing significantly fewer viable nymphs. Our study reveals that anthropogenic noise imposes hidden reproductive costs on insects, threatening population viability in increasingly urbanized environments.

Cognitive exaptation to anthropogenic environments

Sofia Forss¹, Benjamin Robira², Stephanie Mercier³, Paige Barnes⁴, Oceane Lüscher⁵

¹University of Zurich, Switzerland

²University of Amsterdam, The Netherlands

³University of Bern, Switzerland

⁴University of Faro, Portugal

⁵University of Lausanne, Switzerland

Urbanization is often hypothesized to drive increased cognitive abilities. However, this research challenges that consensus, proposing that large-brained species are often "exapted" for urban life—thriving by applying pre-evolved toolkits to exploitable niches. We investigated this through a series of studies on vervet monkeys (*Chlorocebus pygerythrus*) across captive, semi-urban, and wild habitats. First, we found no differences in basic problem-solving skills (string-pulling) or behavioural flexibility (puzzle-boxes) between wild, urbanized, and captive populations. Performance was high and consistent regardless of anthropogenic experience or "free time" in captivity. Second, individual variation in innovativeness was not driven by human food "raiding" experience. Finally, when facing new threats like domestic dogs, monkeys relied on ingrained ancestral behaviours rather than novel urban cues. Together, these findings suggest that urban persistence relies on latent, species-typical cognitive traits rather than contemporary selective drivers for improved cognition. Success in the Anthropocene may thus reflect the flexible deployment of an already rich cognitive repertoire.

What can we learn from studying curiosity in animals? Insights from primatology

Sofia Forss, Erik Willems,

University of Zurich, Switzerland

Curiosity is a core mechanism of intelligence, driving life-long learning and uncertainty reduction. While typically defined as an intrinsic motivation to acquire information without immediate extrinsic reward, curiosity research has largely focused on human language-based tasks, overlooking the evolutionary continuum. This work integrates animal behaviour and comparative cognition, using non-human primates to illuminate the factors shaping the evolution of curiosity in our own species. Unlike modern humans, our ancestors faced hazardous environments where individual curiosity was not always favoured. Great apes, living under conditions more similar to these ancestors, provide a vital model for understanding this trait's history. Comparative findings across ape species suggest a curiosity gradient aligned with sociality. I propose the Social Curiosity Hypothesis to explain this pattern: individuals in highly social species (e.g., bonobos and chimpanzees) are accustomed to constant social cues, leading to inhibited curiosity when alone compared to more solitary orangutans. Consequently, the selection for curiosity likely occurred in direct interaction with sociality.

The cost of city living: increased female care but reduced reproductive success in urban house sparrows

Agnes Francila F, Vinita Gowda

Tropical Ecology and Evolution (TrEE) lab, Department of Biological Sciences, IISER Bhopal, India

Urbanisation alters habitat structure, reshaping species distribution, resource dynamics and predator pressure, thereby introducing novel selective pressures. These changes can influence behaviour, including parental care, a key determinant of offspring survival in altricial species; however, responses of parental care to urban environments remain poorly understood. The house sparrow (*Passer domesticus*), a widespread human commensal found in both urban and rural habitats, serves as a useful model to examine how species adapt to anthropogenic changes. We quantified parental behaviours from nest construction to offspring provisioning across eight rural and nine urban populations (183 nest boxes) in southern India. Our results show that urban females exhibited significantly higher parental investment compared to their rural counterparts, whereas male contributions remained stable across habitats. Despite this increased effort, reproductive success was lower in urban areas, likely associated with higher predation pressure. These findings highlight both the behavioural plasticity and its limitations, suggesting potential fitness costs of life in the Anthropocene.

Mechanisms underlying recent changes in foraging and movement behaviour of a long-lived species

Aldina M A Franco, Ines Catry, Marta Acacio, Bruno Martins, Andrea Soriano-Redondo

School of Environmental Sciences, University of East Anglia, United Kingdom

Human-induced environmental change is reshaping animal behaviour worldwide, yet the mechanisms enabling individuals to adopt novel foraging and movement strategies remain poorly understood. Using long-term GPS tracking, census data, and genomic analyses of a long-lived species - white storks (*Ciconia ciconia*), we investigated how behavioural adaptations emerge and change as individuals age. Combining 25 years of population-level data with tracking of 213 individuals and whole-genome sequencing, we explored the mechanisms underlying the rapid shift from migration to residency in white storks. The proportion of non-migratory individuals in Southern Europe increased dramatically in recent decades. Most juveniles migrate in their first year of life but many transition to residency as they age, while adults show high behavioural consistency. We found no evidence of genetic differentiation or selection, instead, the loss of migration is best explained by developmental plasticity, whereby changes in behaviour occur in early life and become fixed in adulthood. Leveraging on our longitudinal tracking data, we examined the ontogeny of a recent foraging behaviour – the use of landfill resources. We found that reliance on anthropogenic food sources increases markedly with age as a result of within-individual improvements, particularly early in life, rather than selective survival. Together, these findings highlight the central role of early-life decisions in shaping behavioural responses to environmental change. This work provides key insights into how long-lived species can rapidly respond to human-driven environmental change.

The effect of anthropogenic noise on vigilance behaviour: a meta-analysis

Raven Frank, Rouven Schmidt, Hansjoerg P Kunc

School of Biological Sciences, Queen's University Belfast, United Kingdom

Anthropogenic noise is a pervasive and rapidly expanding form of environmental change. Yet its effects on vigilance, a behaviour fundamental to predator detection and survival across taxa, have not been systematically quantified across species. Using a phylogenetically controlled meta-analysis of 35 effect sizes from 16 studies spanning 13 invertebrate and vertebrate species, we quantified the effects of anthropogenic noise on vigilance behaviour. We found that noise consistently altered vigilance across taxa. The adjustments in vigilance were consistent with three non-mutually exclusive mechanisms: the risk disturbance hypothesis, acoustic masking with compensatory sensory switching, and cognitive distraction. Variation in responses, i.e. heterogeneity, was partly explained by phylogenetic relatedness, indicating that evolutionary history partially predicts vigilance responses to noise. These findings demonstrate that anthropogenic noise disrupts a behaviour critical to animal survival across the tree of life, highlighting the need to protect natural soundscapes to ensure effective conservation of wildlife.

Multi-modal communication during agonistic encounters in a highly social fish species

Joachim G. Frommen¹, Miles McGaffighan¹, Ryoichi Inoue², Jade Newton-Youens¹, Onur Evren¹, Sue Anne Zollinger¹

¹Manchester Metropolitan University, United Kingdom

²Osaka Metropolitan University, Japan

Most interactions between animals involve some form of communication, based on a broad range of signals that can be sent in different sensory modalities. Modality choice might depend on the environmental conditions, which can change drastically within a short time frame. In fishes, most studies have focused on visual communication, even though many species produce sound during social and sexual interactions. Here we describe acoustic signals in a highly social cichlid species (*Julidochromis* spec. 'Kombe') and tested whether the use of such signals change with variation in visibility. Both sexes produced sound during agonistic encounters. Sound production was more common in larger individuals, making them an honest proxy of size and individual's resource holding potential. Contrary to our expectations acoustic signals were not produced more often when visibility was low. Instead, fish increased their investment of pronounced visual signals under such conditions. These results shed light on the importance of including environmental parameters in studies of social communication not only in fishes, but in social animals in general.

Deciphering dog neural correlates of emotional valence and social motivation in conspecific vocalisations

Franceska Furik^{1,2}, Attila Andics^{1,3}, Tamás Faragó²

¹Neuroethology of Communication Lab, Department of Ethology, ELTE Eötvös Loránd University, Budapest, Hungary

²BARKS Lab, Department of Ethology, ELTE Eötvös Loránd University, Budapest, Hungary

³ELTE NAP Canine Brain Research Group, Budapest, Hungary

Social motivation signals convey the signaller's intent towards surrounding individuals, ranging from hostile (repelling) to non-hostile (attractive). The ability to decipher others' inner states, including social motivation and emotional valence, was demonstrated behaviourally and holds a major role in regulating interactions and, by extension, in promoting survival. While there are reports of ERP correlates of the processing of others' emotional valence, at least in humans, the neural correlates of social motivation are so far unknown in any mammal. To fill this gap, we presented dogs with conspecifics' emotional vocalisations while recording their neural responses with non-invasive EEG. We had three conditions, systematically varying in emotional valence and social motivation dimensions: separation whines (negative & non-hostile calls), play growls (positive & non-hostile), and threatening growls (negative & hostile calls). Presentations of preliminary data are expected for the conference.

Overfishing due to fish learning: impacts of catch-and-release angling on behaviour towards lures in two freshwater predators in the wild

Ryo Futamura^{1,2}, Maximilian Roederer³, Tammo Steinke⁴, Henrik Baktoft⁵, David James², Robert Arlinghaus^{2,6}

¹University of Tokyo, Japan

²IGB-Berlin, Germany

³University of Potsdam, Germany

⁴TU Berlin, Germany

⁵DTU Aqua, Denmark

⁶HU Berlin, Germany

Exposure to catch-and-release recreational fishing constitutes a form of human-induced predation risk to which fish should respond with bait and lure avoidance behaviour within the realm of private and social learning. We conducted a whole-lake scale before-after-control-impact (BACI) study targeting previously angling-naïve pike (*Esox lucius*) and European perch (*Perca fluviatilis*). A treatment lake was cut in half to simulate a no-fishing protected area, with another lake not exposed to fishing serving as a spatial control to absorb seasonal changes on fish behaviour unrelated to fishing. Intensive catch-and-release fishing over two months resulted in catch-and-release about 55 % of the predator fish population. Non-exploitative fishing causally reduced catch rates in experimental angling by about 55 % relative to controls, which is particularly pronounced in pike. Using high resolution fish tracking and mark-recapture studies we ruled out that the changing catch was caused by fish abundance changes within or among lakes. Camera-assisted trolling revealed that the predator's behaviour towards lures significantly changed in the treatment side, mechanistically explaining the drop in catch rate. Alteration of lure reactivity in catch-and-release fishing constitutes a behavioural insurance policy that helps fish to sustain fishing pressure.

The effects of headlight emissions on noctuid moth dark adaptation

James AM Galloway¹, Charlie Rayner¹, Kevin J Gaston², Jolyon Troschianko¹

¹Centre for Ecology and Conservation, University of Exeter Penryn Campus, United Kingdom

²Environment and Sustainability Institute, University of Exeter Penryn Campus, United Kingdom

Alongside the diverse ecological impacts of static sources of artificial light at night (ALAN), mobile sources (e.g., vehicle headlights) are predicted also to have such impacts. Given the high, and increasing, numbers of road vehicles in much of the world, it is important to understand the lethal and non-lethal effects on wild organisms of the pulsed ALAN (pALAN) produced by passing headlights. With the effects of ALAN on moth populations and their role as pollinators being a particular concern, in this study we determined the light adaptive responses of noctuid moth eyes to pulsed light stimuli; temporary reductions and loss of nighttime vision can significantly impact moth ecology. Across eight Noctuidae species, pulsed light caused a loss of dark adaptation regardless of light intensity or frequency of pulse delivery. However, repeated exposures over time (simulating higher levels of passing traffic) increased the intensity and duration of this loss of low light vision. Our results indicate that headlight emissions are likely to have a significant impact on moth vision during peak activity periods, especially in high-traffic sections of the UK road network.

Light pollution, global warming, and their interaction: effects on fish behaviour

Elia Gatto, Department of Chemical, Francesca Conti, Gaia De Russi, Cristiano Bertolucci, Tyrone Lucon-Xiccato

Department of Life Sciences and Biotechnology, University of Ferrara, Italy

Anthropogenic activities are widely recognised as major drivers of ecological disruption in both terrestrial and aquatic ecosystems, altering biotic and abiotic conditions. Alongside rising global temperatures and increasing extreme weather events, light pollution has also emerged as a pervasive environmental stressor affecting daily rhythms. As the vertebrate nervous system is highly sensitive to external stimuli, these stressors may disrupt individual homeostasis, a key aspect for ectothermic species. To date, we conducted experiments exposing fish to mesocosms simulating anthropogenic stressors (e.g. heat stress and artificial light at night, ALAN) to investigate behavioural effects across developmental stages. Exposure to ALAN altered locomotor activity, brain function and cognitive ability in early life stages, while prolonged exposure affected more complex cognitive functions in adults. At larval stages, heat-stressed individuals showed reduced activity, impaired learning and altered behaviour–cognition associations. When exposed to both stressors simultaneously, fish exhibited alterations in survival and behaviour that differed from the independently observed effects. Overall, heat stress and light pollution impair behaviour and cognition across life stages and alter behavioural–cognitive trait relationships, with potential fitness consequences.

A transcriptional timeline of stress and recovery in the cricket *Gryllus bimaculatus*

Emily Gilford*, Bartek Troczka, Chris Bass, Bram Kuijper[^], Ben Hunt[^]

Centre for Ecology and Conservation, Biosciences, University of Exeter, Penryn, United Kingdom

Stress responses are dynamic, with hormonal fluctuations driving physiological and behavioural changes. In insects, neuromodulators like octopamine and juvenile hormone (JH) vary across the stress response, yet most transcriptomic studies rely on single time points. In contrast, vertebrate studies highlight the value of time-resolved approaches. We examine acute stress and recovery in *Gryllus bimaculatus* using a controlled stressor and RNA-seq across a fine-scale time course. Preliminary analyses reveal temporal patterns with peak transcriptional change during recovery, including a transient peak at 60-min post-stress characterised by metabolic and cellular processes. To assess early responses, we examined immediate early genes (IEGs), rapidly induced by acute stressors. Early activation remains limited; however, we identify a candidate IEG, Krueppel homolog-1 (Kr-h1), which shows a transient early profile consistent with acute stress. Kr-h1 is a zinc-finger transcription factor acting downstream of JH signalling, regulating gene expression in hormone-mediated responses, and may act as a parallel to vertebrate stress response IEGs. These preliminary findings show the value of time-resolved transcriptomics in understanding stress dynamics, highlight recovery as a key phase, and identify a candidate IEG linking hormonal signalling to transcriptional change.

Hormonal and behavioural phenotypes in juvenile male guinea pigs living in distinct social environments

Melanie Gleske, Carolin Mundinger, S. Helene Richter, Sylvia Kaiser

Department of Behavioural Biology, University of Münster, Germany

Individuals can adjust to different social environments via shaping of endocrine and behavioural phenotypes. As the social environment can change at any time, individuals should be able to adjust throughout life. We examined effects of two different social environments on endocrine and behavioural phenotypes in male guinea pigs during juvenility, a crucial developmental phase marked by prominent changes of the social environment. Twenty juvenile males lived in heterosexual pairs, but one group additionally received regular social stimulation (e.g., brief exposure to unfamiliar conspecifics). This procedure increased the number of social interactions. Only these males displayed an initially increased stress responsiveness, allowing them to adequately react to unpredictable social encounters. Over time, stress responsiveness decreased, indicating males conformed to this challenging environment. They also showed a significant increase of courtship and sexual behaviour with age. Our findings demonstrate that the social environment during juvenility induces hormonal and behavioural adjustments, highlighting the role of juvenile social experiences in shaping individuals' phenotypes.

Understanding chimpanzee (*Pan troglodytes*) facial and behavioural expression of emotion, personality and wellbeing

Jade Goddard, Lindsay Murray, Sonya Hill

University of Chester, United Kingdom

I am conducting a series of studies within my PhD to gain an understanding of chimpanzee (*Pan troglodytes*) facial and behavioural expression of emotion, personality and wellbeing. Study 1 explores facial expressions as a form of communication amongst chimpanzees based on the honest signalling framework proposed by Kramer et al. Honest signalling theory suggests humans can extract personality information from the faces of chimpanzees relating to extraversion, agreeableness, emotional stability, openness, conscientiousness and disinhibition. I am currently completing a systematic review to explore the different techniques of identifying facial expressions to determine which measure may be the most effective for future animal research. The use of technology has been increasing in the monitoring of non-human primates including their welfare, therefore there is a need to conduct a systematic review into the different measures of facial signals. In this presentation I will review the current knowledge of honest signalling and the use of ChimpFACS to measure facial expressions in chimpanzees. Furthermore, I will review the different measures of facial expressions through a systematic review that I am currently carrying out in hope to determine the most efficient measure of facial recognition.

Climate-change driven bird-insect phenological mismatch in a migratory passerine

Ana Cristina Gomes, Vincent Heldt Cassel, Yishu Zhu, Ester Martínez-Renau, Elin Videvall, David Berger, Anna Qvarnström
Uppsala University, Sweden

Organisms at higher trophic levels often adjust their phenology to climate change at slower rates, than those at lower levels. Thus, in a warming world, insectivorous birds may breed too late to match earlier abundance peaks in their insect prey. Whether such mismatched insectivorous birds can adapt their breeding behaviour quickly enough to the earlier emergence of caterpillar remains an understudied topic, but central for predicting the effects of climate change. We used a long-term dataset of an insectivorous and migratory passerine bird, the collared flycatcher (*Ficedula albicollis*), with estimates of the peak in caterpillar abundance, to study phenological mismatch across 21 years, and its fitness consequences. Flycatcher-caterpillar mismatch increased with increasing spring temperature, and mismatched flycatcher pairs experienced reduced fitness. Although the flycatchers have responded to selection for earlier onset of their breeding across years, the phenological mismatch remains and the number of recruiting offspring is declining. Thus, large yearly fluctuations in spring temperatures, as compared to the slow overall trend of increasing temperatures, seems to be a major constraint for the flycatchers to achieve synchrony with their caterpillar prey.

Are all snaps equal? Characterising species-specific acoustic behaviour in coral reef snapping shrimp

Hannah Gower¹, Jess M. Hodge², James Campbell³, Safi Darden⁴, Ashlee Lillis⁵, Miles Parsons^{6,7,8}, Sophie L. Nedelec¹

¹Biosciences, University of Exeter, Exeter, Devon, United Kingdom

²School of Biological Sciences, University of Bristol, Bristol, Bristol City, United Kingdom

³Leibniz Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany

⁴Psychology, University of Exeter, Exeter, United Kingdom

⁵Sound Ocean Science, Calgary, Canada

⁶Australian Institute of Marine Science, Crawley WA, Australia

⁷Oceans Institute, University of Western Australia, Crawley WA, Australia

⁸Centre for Marine Science and Technology, Curtin University, Bentley WA, Australia

The pervasive crackle of snapping shrimp dominates coral reef soundscapes and serves as a well-established acoustic indicator, with healthier reefs typically associated with higher snapping activity. Yet snapping shrimp remain understudied; despite over 500 described species, research remains largely restricted to the community-level, limiting monitoring applications and confounding interpretation of changeable - and often contradictory - temporal trends. To address this, a controlled in situ experiment assessed species-specific snapping behaviour and sound production across natural diel light and temperature cycles. A triaxial particle motion accelerometer was used to localise snaps to individual, identified shrimp, enabling fine-scale attribution rarely achieved in field settings. Representatives from ten species included four symbiotic relationships (coral, crinoid, anemone, and cyanobacteria-associated) as well as rubble-associated species enabling investigation of snapping as an indicator for these reef organisms and habitat condition. As rapid environmental change threatens coral reefs globally, improved characterisation of species-specific behaviour is vital to disentangle this fundamental component of reef soundscapes and underpin the development of meaningful, snap-focused eco-acoustic indices capable of tracking reef health.

Charting a new chimpanzee behavioural realm from Chinko, The Central African Republic

Thurston Cleveland Hicks, Nora Bennamoun
The University of Warsaw, Poland

I will present the results of a combined total of 17 months of surveys of behavioural diversity of Eastern chimpanzees (*Pan troglodytes schweinfurthii*) living in the Chinko Reserve in southeastern Central African Republic. Tool technology as well as nesting habits will be compared both between populations within the reserve (some of the populations are dissected by large rivers) and also between Chinko and Bili-Uere to the south. The Chinko chimpanzees inhabit similar habitat to those at Bili and share recent genetic connectivity. Surprisingly, however, they exhibit a unique behavioural profile (lack of ground nesting, high nests and distinctive tools) which seems to occur across the observe. I will discuss the implications for the spread of behavioural diversity in an extant hominid species.

Arthropod availability shapes reproductive trade-offs and apparent survival in a declining grassland bird

Martin Kueblbeck, Wolfgang Goymann
Max-Planck-Institute Seewiesen, Germany

Trade-offs between reproduction and self-maintenance are central to life-history theory and shape population trajectories. In insectivorous birds, prey availability during breeding is a key constraint, and ongoing insect declines may intensify reproductive trade-offs with consequences for population dynamics. We studied an endangered insectivorous passerine, the whinchat (*Saxicola rubetra*), at two breeding sites that differed markedly in arthropod abundance. Using this contrast as a natural experiment, we tested whether reduced prey availability alters parental provisioning and breeding success, whether parents behaviourally compensate for lower food supply, and whether such compensation entails physiological or demographic costs for parents or offspring. We used linear mixed models to compare prey availability and delivery, parental behaviour, breeding success, body condition of adults and nestlings, and mark-recapture analyses to estimate apparent survival of adults and juveniles between sites. Despite substantially lower arthropod abundance at one site, prey delivery and breeding success did not differ between sites. Parents at the prey-poor site travelled farther, used larger home-ranges, and spent less time at the nest. No direct physiological costs were apparent in nestlings, but feeding adults had reduced body mass at the low-quality site. Most importantly, apparent survival of both adults and juveniles was substantially lower at the low-quality site, indicating severe and potentially intergenerational fitness consequences of reduced prey availability. Our results demonstrate that parental compensation can buffer short-term reproductive success under low prey availability. However, breeding in prey-limited habitats can ultimately incur substantial survival costs, highlighting the importance of promoting arthropod-rich habitats for the conservation of whinchats and other grassland birds.

Spontaneous sound localisation behaviour in freely moving common marmosets (*Callithrix jacchus*)

Julia Victoria Grabner¹, Anna Elisa Kempf^{1,2,3}, Timo Krug⁴, David Meijer², Robert Baumgartner², Ulrich Pomper⁴, Thomas Bugnyar¹, Michelle Spierings^{1,5}

¹Department of Behavioral and Cognitive Biology, University of Vienna, Vienna, Austria

²Acoustics Research Institute, Austrian Academy of Sciences, Vienna, Austria

³Animal Innovation Research, Messerli Research Institute, University of Veterinary Medicine, Vienna, Austria

⁴Department of Cognition, Emotion and Methods in Psychology, University of Vienna, Vienna, Austria

⁵Institute of Biology Leiden, Leiden University, Leiden, The Netherlands

Utilizing acoustic information is essential for individuals to navigate their surroundings and respond to conspecifics, potential predators, or prey. Although head movements are natural sound localisation behaviours that help to resolve spatial ambiguities, most non-human primate studies have been carried out on anaesthetised or restricted individuals. To investigate sound localisation behaviour under more natural conditions we tested 6 (5m/1f) freely moving captive common marmosets (*Callithrix jacchus*). We played conspecifics' food calls from a horizontal array of eleven loudspeakers and tracked individuals' head rotations using DeepLabCut. Applying Bayesian generalized linear mixed models (GLMMs) we show that head movement velocities increased following stimulus onset and that individuals tended to orient their heads toward the side of the stimulus presentation (left or right), though typically not fully aligning with the sound source speaker. These results help us better understand marmosets' orientation responses to sounds and set a basis for further studies testing sound perception in unrestricted individuals.

Vibrissal sensory landscapes in Pinnipeds in the Anthropocene

Robyn Grant¹, Héloïse Frouin-Mouy^{2,3}, Jody Weir⁴

¹Department of Natural Sciences, Manchester Metropolitan University, United Kingdom

²Cooperative Institute for Marine and Atmospheric Studies, University of Miami, United States of America

³Department of Biology, University of Victoria, Canada

⁴Department of Conservation, Kaikōura, New Zealand

Most mammals possess vibrissae (whiskers), which play a key role in guiding spatial orientation, locomotion, and foraging. Among mammals, pinnipeds have the most specialised and sensitive vibrissal systems. Here, we present the first field-based studies of whisker use in New Zealand fur seals (*Arctocephalus forsteri*) and grey seals (*Halichoerus grypus*). Both species demonstrate pronounced vibrissal movements during environmental exploration and social interactions. Beyond their established role in tactile sensing, pinniped vibrissae are also capable of detecting self-motion and hydrodynamic cues, and may even contribute to sensing sound and temperature. Using a case study of northern elephant seals (*Mirounga angustirostris*), we provide the first evidence of sound production with coordinated head and whisker movements during natural foraging behaviour. This finding highlights the importance of fine-scale, precise vibrissal movements in prey detection and capture. However, aquatic environments are increasingly affected by anthropogenic pollution, including acoustic noise and electromagnetic disturbance. The extent to which such factors interfere with vibrissal sensing remains poorly understood. Data from a systematic review is combined here with controlled flume tank experiments on vibrissae to address this knowledge gap. Our findings suggest that acoustic noise and altered airflow and water flow regimes can induce vibrissal shaft oscillations, with the potential to mask biologically relevant stimuli such as prey-generated signals. Improving our understanding of these impacts is critical for assessing the resilience and vulnerability of vibrissal sensing in the face of rapid environmental change.

Microbe, mates and contact: insights from guppies (*Poecilia reticulata*)

Marco Graziano¹, Davide Piazza¹, Alessandro Devigili², Gian Luigi Garbini², Livia Pinzoni², Andrea Quagliariello¹, Emanuele Bosi³, Clelia Gasparini¹, Marco Fondi¹, Maria Elena Martino¹

¹Department of Comparative Biomedicine and Food Science, University of Padua, Padua, Italy

²Department of Biology, University of Florence, Italy

³Department of Earth, Environmental and Life Sciences, University of Genoa, Genoa, Italy

Host-associated microbiomes are shaped by environmental and host factors, yet their links to reproduction remain unclear. Using the guppy (*Poecilia reticulata*), we used two approaches to test how microbiomes relate to male fertility and how social interactions influence microbiome assembly. We characterised skin- and ejaculate-associated microbiomes and tested associations with sperm traits. Ejaculate microbiomes were unrelated to sperm performance, whereas higher skin microbiome diversity was negatively correlated with sperm velocity; however, taxa in both tissues were associated with sperm performance. These patterns suggest external microbiomes may reflect physiological or immunological states linked to fertility. We then tested behaviour-mediated microbial transmission by cohabiting perturbed and control guppies in contact or separated by a permeable barrier to separate environmental from behavioural transmission. Cohabitation promoted microbiome convergence, and transmission was sex-specific and asymmetric. Behavioural metrics such as proximity and time spent together predicted microbial similarity. Together, these findings show that social interactions structure host-associated microbiomes and link skin-associated microbial features to male reproductive performance, providing a framework to disentangle host, microbial, and environmental contributions.

Crossing boundaries: inbreeding avoidance increases hybridisation in mixed species settings

Ginny Greenway

Department of Zoology, University of Cambridge, United Kingdom

When choosing a mate, individuals must navigate a complex social environment composed of a broad relatedness spectrum of close relatives through to members of other species. This challenge is exacerbated in small populations and at species distribution margins. How do animals pick an optimally outbred mate and avoid costly reproductive behaviours, such as inbreeding or hybridization with heterospecifics? And can inbreeding avoidance behaviour inadvertently lead to an increased risk of interspecific mating? In this study I quantify the relationship between inbreeding and hybridization risk using the insect *Tribolium castaneum* as the focal species. I presented *T. castaneum* males with a choice between a heterospecific *T. confusum* female and either a) an unrelated *T. castaneum* conspecific or b) a full sibling and recorded subsequent mating activity. In the presence of a sibling, males were 28% more likely to mount the heterospecific female first and 66% more likely to engage in hybrid mating activity over the course of the trial. Modifying the inbreeding status of the focal male did not impact its mating behaviour. Taken together, males appeared to prioritise inbreeding avoidance over hybridisation avoidance, despite the fact that inbred offspring are fertile whilst *T. castaneum*-*T. confusum* hybrids are not. Therefore adaptive mate choice strategies in a single species setting may become maladaptive in mixed species contexts. The interplay between the social relatedness landscape and mate choice strategy is likely to be a crucial contributor to the impacts of fragmentation, bottlenecks and invasions on population dynamics.

Does electrosmog affect the orientation behaviour and migratory restlessness of caged wild migratory songbirds?

Matteo Guidotti, Annika Peter, Thiemo Karwinkel, Bo Leberecht, Simon Käfer, Markus Panneke, Gabriele Gerlach, Michael Winklhofer, Henrik Mouritsen, Heiko Schmaljohann

Carl von Ossietzky University Oldenburg, Germany

Night-migratory songbirds orient using cues such as the Earth's magnetic field, stars, the sun, landmarks, and olfaction. Weak broadband electromagnetic noise ('electrosmog') emitted by electronic devices disrupts the radical-pair-based mechanism, proposed to perceive the magnetic field, in the laboratory. We investigated the effects of electrosmog on Northern wheatears (*Oenanthe oenanthe*) during active migration inside orientation cages on Helgoland. A milky lid prevented birds from using the star compass instead of the disrupted magnetic compass. By using deep neural networks (DeepLabCut™), we quantified orientation and migratory restlessness behaviour and considered head scanning movements that are likely important for the use of the magnetic compass but are not recorded in classic Emlen funnels. By removing the lid, stellar cues were made accessible again. We then tested electrosmog effects on take-off decisions of free-flying birds under overcast and clear sky conditions. With this methodological approach, we can study birds' behaviour with high spatiotemporal resolution and encourage the usage of new tools to assess behavioural traits otherwise unobserved.

Temporal aspects of short-term, intermediate and long-term affective states in non-human animals: assumptions and evidence

Laura Whalin¹, Laura E. Webb², Alex H. Taylor³, Michael T. Mendl⁴, Benjamin Lecorps⁴, Else Verbeek⁵, Jean-Loup Rault⁶, Ruth C. Newberry⁷, Heather W. Neave⁸, Björn Forkman⁹, Angélique Favreau-Peigné¹⁰, Matteo Chincari¹¹, Monica Battini¹², Lorenz Gyga¹³

¹Department of Animal Health and Food Safety, Norwegian Veterinary Institute, Ås, Norway

²Animal Production Systems Group, Department of Animal Sciences, Wageningen University, Wageningen, Netherlands

³Instituto de Neurociències, Universitat Autònoma de Barcelona, Barcelona, Spain; ICREA, Barcelona, Spain; School of Biological Sciences, University of Canterbury, Christchurch, New Zealand

⁴Animal Welfare and Behaviour Group, Bristol Veterinary School, University of Bristol, Bristol, United Kingdom

⁵Swedish University of Agricultural Sciences, Department of Applied Animal Science and Welfare, Uppsala, Sweden

⁶Animal Welfare Science Unit, University of Veterinary Medicine Vienna, Vienna, Austria

⁷Department of Animal and Aquacultural Sciences, Faculty of Biosciences, Norwegian University of Life Sciences, Ås, Norway

⁸Department of Animal Sciences, Purdue University, West Lafayette (IN), USA

⁹Department of Veterinary and Animal Sciences, University of Copenhagen, Frederiksberg, Denmark

¹⁰Université Paris-Saclay, UVSQ, INRAE, BREED, Jouy-en-Josas, France; Ecole Nationale Vétérinaire d'Alfort, BREED, Maisons-Alfort, France

¹¹Department Veterinary Medicine, University of Teramo, Teramo, Italy

¹²Department of Agricultural and Environmental Sciences, University of Milan, Milan, Italy

¹³Animal Husbandry & Ethology, Albrecht Daniel Thaer-Institute of Agricultural and Horticultural Sciences, Faculty of Life Sciences, Humboldt-Universität zu Berlin, Berlin, Germany

Affective states change across time, and this dynamic is important for understanding the role of affect in proximate behavioural control and assessing animal welfare. Here, we make explicit the assumptions of two published temporal models, refine the models, and suggest avenues of investigation. The models depict sequences of 'affective events' that induce short-term states (emotions) and we argue that such states vary across anticipatory, consummatory, and post-consummatory phases of an event. The first two phases are largely dependent on the environment, i.e. whether and what kind of resources are encountered, whereas a (self-)assessment of how well an animal dealt with an event occurs in the consummatory phase and results in a prediction error. These usually yield low-arousal affective states and have been shown to be potent incremental drivers of intermediate-term mood. Mood also feeds back on the experience of an event either enhancing congruent valence or according to a contrast in valence. When no specific affective events occur, mood is likely to regress towards a baseline, which may be weakly positive. This baseline may reflect a long-term state of "affective happiness" which is only changed by highly significant affective events. Whilst an affective happiness construct has been identified humans, it is currently unclear whether animals can experience such a state.

Social information use during nest construction in a wild corvid and its implications for animal culture

Luca G. Hahn^{1,2}, Zazie Benoit-Delaby^{1,3}, Guillam E. McIvor^{1,4}, Ines Fürtbauer², Andrew J. King², Alex Thornton¹

¹University of Exeter, United Kingdom

²Swansea University, United Kingdom

³University of Toulouse, France

⁴University of Vienna, Austria

Animal cultures have been demonstrated across a range of taxa and behavioural domains, from foraging to migration to communication. However, an important potentially cultural behaviour that has received less attention is animal architecture, and avian nest construction in particular. Birds readily use social information during nest construction in laboratory studies, yet little is known about the role of social information use and its implications for culture in the wild. Here, we investigated social information use during nest construction in wild jackdaws, highly social corvids that breed semi-colonially. We quantified the timing of nest initiation and material selection in relation to spatial proximity and prospecting networks. Additionally, we conducted an open diffusion experiment by providing coloured anthropogenic material. Across an eight-year period, a spatial proximity network predicted initiation of nest construction, indicative of social facilitation. Moreover, study sites differed in their mean timing of nest initiation, consistent with emergent local traditions. Dyadic similarity in nest material composition was higher within study sites than across semi- or non-connected study sites and was predicted by a spatial proximity and a prospecting network within sites. Both networks also predicted uptake of coloured experimental material, suggesting social learning of material selection. These results were not explained by several ecological, social, and individual-level variables. Together, these converging patterns reveal social information use during nest construction in a wild corvid, generating spatial variation consistent with local traditions. Thus, avian nest construction, and animal architecture more broadly, should be established as an important domain of animal culture.

Causes and consequences of individual differences in personality traits between edge and core habitats in a woodland specialist ground beetle

Ciaran Harris, Wiebke Schuett, Claudia Drees, Jeremy Niven, Michael Grant, Stanley A Edwards
University of Sussex, United Kingdom

Habitat fragmentation increases the proportion of habitat edges, where environmental conditions differ from habitat cores and can be less favourable for habitat specialists. Little is known about how edges influence individual variation in behaviour, which may arise through phenotypic plasticity or local adaptation of different personality types (i.e. individuals showing consistent behavioural differences). Differentiating between these mechanisms is important as they may have very different consequences on population resilience against environmental change. We used a woodland specialist ground beetle to examine how behaviour varies between edges and cores. Over three years, we repeatedly tested exploratory behaviour in ~2000 individually marked beetles within large (177 m²) enclosures at woodland edges and cores. We also translocated ~300 beetles between habitats to examine mechanisms underlying behavioural differences. Individuals showed personality differences, were more exploratory in habitat edges compared to cores which was predominantly caused by local adaptation. This project contributes to our understanding of how behavioural variation is structured across fragmented landscapes and highlights the role of individual behavioural differences in responses to anthropogenic stress.

Consequences of mismanagement: government cull of sheep river's bighorn rams shifts demography and phenotypic expression

Tanisha C. Henry, Amelie A. Hannan, Peter Neuhaus, Kathreen E. Ruckstuhl
Biological Sciences, University of Calgary, Canada

Bighorns rams (*Ovis canadensis*) grow large, curled horns; due to of sexual selection large-horned rams are the most dominant and have the highest reproductive success. However, these rams are also preferred by trophy hunters, and this size-selective harvest works in opposition to sexual selection. Long-term data from the Sheep River (SR) Provincial Park (Alberta, Canada) population was used to create a theoretical model which showed that intense hunting drives rapid phenotypic change via shifts in demography, and trade-offs between behaviour and energy allocation (Schindler et al. 2020). In March 2023, a government cull removed all adult rams from the SR population (~90% size-selected harvest). Young males (~3 years) quickly filled dominant positions, investing heavily into mating. Using behavioural observations and horn photographs, we will test whether the young rams who survived the cull increased reproductive effort at the expense of growth as modelled (Schindler et al. 2020). This work will show how intense artificial selection shapes behaviour, morphology, and life-history trade-offs with implications for conservation and wildlife management strategies that alter demography.

Determinants of male reproductive success in polygynandrous wild Assamese macaques

Alice Hill¹, Christian Roos², Oliver Schülke¹, Julia Ostner¹

¹Department of Behavioral Ecology, Georg-August-Universität Göttingen, Germany; Primate Social Evolution Research Group, German Primate Center, Germany

²Primate Genetics, German Primate Center, Germany

In most male mammals, access to females—and thus mating opportunities—is limited, resulting in variation in male reproductive success. This variation is typically shaped by male-male competition, which produces dominance hierarchies in which high-ranking males monopolize paternity. Competitive ability is also influenced by age, with prime-aged males expected to sire the most offspring. Additionally, males unable to compete directly may adopt alternative mating strategies that leverage female choice, such as investing in infant care. Combining demographic, behavioural, and genetic data across 14 years and up to six social groups, we test these drivers of variation in reproductive success in wild Assamese macaques, a species characterized by moderate male reproductive skew. Male rank was quantified as monthly Elo ratings based on 5,767 submissive interactions, male care for infants extracted from observational focal animal data, and paternity assigned to 172 infants. We assess the relative importance of direct contest potential, competitive ability, and mate choice in determining male reproductive success in a wild primate. Our findings demonstrate the interplay of these factors and highlight the multiple pathways to reproductive success in this species.

Linking weather to foraging decisions: a going-out model

Friederike Hillemann^{1,2}, Bret A. Beheim², Elspeth Ready²

¹Department of Psychology, Durham University, United Kingdom

²Department of Human Behavior, Ecology and Culture, Max Planck Institute for Evolutionary Anthropology, Germany

Weather conditions influence hunting and other foraging decisions across species, including humans. Foraging-return analyses traditionally emphasise effort and skill as determinants of production, but in contemporary mixed cash–subsistence economies, foraging also depends on disposable time and money; fixed work schedules and income needs constrain time and flexibility, creating trade-offs between wage labour and subsistence activities. Here, we present a Bayesian model of day-to-day going-out decisions to investigate how environmental and socio-economic constraints jointly shape participation. The model links local weather conditions (temperature, wind speed) with individual characteristics (e.g. employment status) to examine daily decisions to “go out”. We combined behavioural data from 13 Inuit hunters in the Canadian Arctic (followed over 273 days) with local weather records, analysing 3,163 person-days of decisions to engage in hunting, fishing, and other foraging activities. We find that participation is strongly affected by wind and reflects socio-economic constraints on opportunity, varying by employment status and across the week. We quantify missed foraging opportunities associated with engagement in the cash economy and highlight consequences of individual variation in subsistence participation.

Evaluating the habituation of introduced raccoon dogs to humans using flight initiation distance

Masashi Hiraki, Takahiro Ota

Graduate School of Human Sciences, The University of Osaka, Japan

The habituation of wildlife to humans increases the risks of crop raiding and zoonoses. Understanding this process and mechanism is therefore crucial for mitigating human and wildlife conflicts. Flight initiation distance (FID) is frequently used to evaluate habituation of wildlife. However, previous studies show taxonomic and geographical biases, necessitating broader research. In addition, FID studies primarily focus on daytime research, and nighttime research remains limited. Therefore, we focused on nocturnal FID in raccoon dogs, a medium-sized mammal with relatively few research cases. This study evaluated habituation of the raccoon dog (*Nyctereutes procyonoides*), an invasive species on an island in Japan. We recorded FID and spatial data during both diurnal and nocturnal periods from September 2024 to July 2025. Analysis of the FID data revealed no significant diel differences. This suggests that raccoon dogs in the study area are habituated to humans regardless of the time of day. Consequently, this indicates that the study area may readily approach humans during daytime and nighttime. Therefore, we suggest that countermeasures are needed to maintain an appropriate distance between humans and wildlife.

Effect of veterinary teaching procedures on dairy cattle behaviour

George M. W. Hodgson, Mahejabeen Hossain Nidhi, Kate J. Flay

Department of Veterinary Clinical Sciences, Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong, Hong Kong SAR, China

Veterinary procedures are crucial for dairy cow management and pregnancy diagnoses, and require highly competent and experienced professionals. Essential skills are taught through live animal practice but the impact of veterinary teaching procedures on cow behaviour and welfare remains unknown. We investigated how routine veterinary teaching practises (e.g., handling, examination and rectal palpation) affected the behaviour of 7 groups of Jersey dairy cows. Cows were group-housed ($n \sim 11$) in an indoors free-stall barn with 24-hour surveillance cameras and continuous recording of laying frequencies, brush use, agonistic replacement and allogrooming. We used paired t-tests to compare behaviour rates between time-matched 12-hour pre-treatment and post-treatment periods. Groups did not differ in rates of laying, brush use, agonistic replacement or allogrooming before or after treatment. Our results highlight nuances in positive animal welfare and suggest that teaching veterinary procedures have minimal effect on specific cow behaviours. However, factors such as personality and individual physiology may play a role in individual responses, warranting further investigation.

Good intentions, bad cues: environmental cues influencing nest box selection in blue and great tits

Maeve Hoogland, Emily Burdsfield-Steel, Eefje van Stelle
University of Amsterdam, The Netherlands

Urbanisation comes with both challenges and benefits for the animal inhabitants of towns and cities. One challenge is that animals might assume the city a favourable place for them to live when in fact, it is not (and ecological trap). Blue- and Great tits (*Cyanistes caeruleus*) (*Parus major*) for example readily nest in nest boxes, sometimes preferring them over natural cavities. Indeed, if these birds use the presence of cavities (which nest boxes mimic) as an indicator of suitable habitat, then nest boxes may provide unreliable cues. The consequence of this preference is that nest boxes in unfavourable habitats with insufficient food might be preferred over natural cavities with sufficient recourses. We studied how cues such as the tree species, size, and surrounding habitat impact the occupancy of urban nest boxes, as well as the breeding success of the birds that use them. The outcome of this experiment can help us make better decisions in the placement of nestboxes which will hopefully result in an improvement in the survival rate of fledgelings in urban environments.

Between fire and fragmentation: interacting disturbances shape boreal caribou movement and predator-prey spatial overlap

Margaret M Hughes¹, Tanisha C Henry¹, Agnès Pelletier², Jesse Tigner³, Katherine Wolfenden⁴, Marco Musiani⁵, Peter Neuhaus¹, Kathreen E Ruckstuhl¹

¹Department of Biological Sciences, University of Calgary, Calgary, AB, Canada

²British Columbia Ministry of Water, Land, and Resource Stewardship, Terrestrial Species Recovery Branch, Prince George, BC, Canada

³SwampDonkey Solutions, Pincher Creek, AB, Canada

⁴Fort Nelson First Nation, Fort Nelson, BC, Canada

⁵Department of Biological, Geological, and Environmental Sciences (BiGeA), University of Bologna, Bologna, Italy

Anthropogenic habitat loss and intensifying wildfire patterns generate cumulative landscape changes that threaten wildlife globally. Anthropogenic disturbance creates linear features (LFs), narrow clearings such as roads, fragmenting landscapes, while wildfires alter vegetation structure and shift prey community composition, together modifying predator-prey dynamics. Boreal caribou (*Rangifer tarandus caribou*), listed as Vulnerable on the IUCN Red List, are acutely sensitive to these changes. Reliance on lichens and old-growth forests leaves them vulnerable to reduced forage and elevated predation pressure, as post-disturbance habitats favour alternate prey and elevate predation pressure. Though population-level declines are well documented, how individuals shift their movement and space use across disturbance gradients remains poorly understood. Using Hidden Markov Models and Integrated Step Selection Functions on fine-scale telemetry data, we characterize individual-level behavioural state-shifts in caribou across disturbance gradients in Canada. Initial analyses suggest caribou exhibit high-movement states near LFs and burned areas, with increased predator-prey spatial overlap post-fire. These findings highlight how compounding disturbance reshapes behaviour, with implications for species conservation and restoration planning.

Shoaling and predation in turbid waters

Christos Ioannou

University of Bristol, United Kingdom

Turbidity, the cloudiness of water caused by suspended particles, is increasing in freshwater and coastal habitats because of human activity. This limits visual information and hence responses to food, predators and groupmates. In three-spined sticklebacks (*Gasterosteus aculeatus*), we find no evidence that larger groups are more resilient or susceptible to the negative effects of turbidity, but more synchronised collective behaviour (greater cohesion and polarisation) does improve responses to unpredictable stimuli in turbid water, and this corresponds to shoals being more cohesive and polarised in turbid water. As multiple stressors, we find increased turbidity and temperature counteract one another (i.e. an antagonistic interaction) in the encounter and detection of guppies (*Poecilia reticulata*) as prey, but find synergistic effects of these stressors in the proximity of guppies to one another and to a live predator, which are likely to increase the guppies' predation risk. Despite turbidity having a relatively simple effect on visual information, these recent studies demonstrate that environmental stressors in the Anthropocene often have unpredictable impacts on behaviour.

Human-macaque encounters in a tourist landscape: conflict salience, photography, and public engagement with Gibraltar's Barbary macaques

Eleane Jao, Sylvain Lemoine
University of Cambridge, United Kingdom

Gibraltar's Barbary macaques (*Macaca sylvanus*) live in a tourist landscape where close human-primate encounters are frequent, photographed and sometimes conflict-prone. This study examined how visitors and stakeholders interpret encounters, conflict, media-sharing and monitoring. We collected 108 questionnaires and 24 interviews around the Upper Rock Nature Reserve. Engagement was strongly affective: 69.4% of open responses were positive, while only 3.7% raised conservation concern. Conflict was salient but interpreted differently: theft, aggression and biting were reported, yet attribution to human behaviour was rare. Interviews showed tourists often saw conflict as shocking, whereas some residents and taxi drivers normalised it as coexistence or responses to food cues. Citizen-science engagement was generally positive and linked to macaques' identity importance and witnessing conflict, not factual knowledge or age. Sharing centred on visual platforms; hashtag use was rare and mainly location-based. Although 85% believed visitor behaviour influences macaques, only about 12% framed this as negative. Overall, the findings suggest that human-macaque conflict is not interpreted uniformly: coexistence strategies should therefore address not only macaque behaviour, but also human familiarity, affective engagement and socially patterned media practices.

Development and validation of a qualitative behaviour assessment tool for zoo-housed meerkats (*Suricata suricatta*)

Aurelie Jolivald, Annika Paukner, Samantha Ward

Nottingham Trent University, United Kingdom

Quantifying animals' emotional experiences is challenging due to a lack of self-report and practical and interpretative limitations of behavioural and physiological measures. Qualitative Behavioural Assessment (QBA) provides a rapid, non-invasive whole-animal approach, with demonstrated validity and inter-rater reliability across domestic, farm, and zoo species. However, QBA tools are species- and context-specific, and no validated tool currently exists for zoo-housed meerkats (*Suricata suricatta*). This study therefore aimed to develop and validate such a tool. Behavioural clips (30 s–2 min) were collected from 15 meerkats at three UK zoos, alongside objective measures of emotional arousal and valence, including infrared thermography of eye temperature and ethogram-based behavioural scoring. An expert panel (n = 20) generated a QBA descriptor list, subsequently applied to assess meerkat mood from video footage. Inter-rater reliability and convergent validity with behavioural and physiological measures will be evaluated. The validated tool will support research on human affect transfer in zoo-housed meerkats, and provide a practical welfare assessment resource for the zoo industry.

Warming and decision-making in fish: how increasing temperature shapes behavioural responses and the cognitive consequences

Nick Jones, Barbara Koeck, Helen Spence-Jones, Shaun Killen, Stefan Schuster, Manon Schweinfurth

University of St Andrews, United Kingdom

Temperature fundamentally affects behaviour and thus many cognitive responses in fishes. The mechanisms and ecological context of these effects, however, remain poorly understood. Using paradise fish (*Macropodus opercularis*), we demonstrate that moderate warming within a non-extreme thermal range reshapes cognitive performance by compressing speed-accuracy trade-offs in a maze task. Slower, more accurate individuals became faster and less accurate with warming, resulting in reduced variation in performance across individuals. Importantly, this occurred through altered decision speed rather than impaired cognitive control, suggesting behavioural rather than neural mechanisms. We will present work that extends these findings, exploring the generality and context-dependency of thermally driven changes in speed-accuracy trade-offs and the consequences for decision-making and discrimination. By examining cognitive performance across additional contexts, species, and environmental conditions, we will reveal whether temperature-driven behavioural shifts represent a pervasive constraint on performance and whether it can be mitigated by ecological factors. Our findings will contribute to understanding how more nuanced changes in temperature may impact cognition in fishes and their capacity for behavioural adaptation in our warming world.

The impact of visitor presence on behavioural response in a large cat café

Maria Lopes, [Sarah L Jowett](#), Jonathan R Amory

Anglia Ruskin University Writtle, United Kingdom

The rise in cat café popularity has increased welfare scrutiny, as cats are kept on show in multi-cat environments with close and frequent interaction with visitors. Individual cats may be responding differently to these potential social and human-animal stressors. We studied responses to visitors across seven days at a popular cat café in London. Twenty domestic cats (8 males:12 females) were observed during four periods including during non-visitor (10-11am; 7-9pm) and visitor hours (1-2pm; 4-5pm). Behaviour of individual cats was recorded at 15-minute intervals using instantaneous sampling. GLMMs showed a significant decrease in vigilance and resting and a significant increase in sleeping during visitor periods. Visitor presence did not affect play or exploration. The findings present little evidence of cat welfare issues in that indicators such as vigilance, rest, play and exploration were either reduced or not affected by visitors. An increase in sleeping might suggest confidence in the cats but may be confounded by their natural crepuscular activity. Further research could study location effects and possible social agonistic or support behaviour between cats.

Ravens lead - wolves feed?

Rebeka Kalousek, Silvia Damini, Thomas Bugnyar

Department of Behavioral and Cognitive Biology, University of Vienna

Interspecific social information transfer plays a key role in many aspects of animal ecology from habitat selection to foraging strategies. Predators and scavengers frequently detect and exploit shared food resources but differ in terms of information acquisition and foraging radius. To increase foraging efficiency, both actors therefore often rely on cues generated by other species. Among avian scavengers, common ravens (*Corvus corax*) are wide-ranging and intelligent omnivores that commonly follow large predators like grey wolves (*Canis lupus*) and take advantage of their acquired carrion. Research on this interspecific relationship has primarily examined ravens' perspective, showing how they use acoustically distinct food calls to provide reliable information about food availability to conspecifics. However, comparatively little is known about how wolves respond to such heterospecific cues or how they might benefit from interactions with ravens. This work-in-progress master thesis focuses on wolves' behaviour towards ravens at an individual level and explores how wolves may use information derived from their association with ravens to locate food sources. The project tests two hypotheses: (1) wolves exhibit stable, individually consistent behaviours toward ravens across different feeding contexts, and (2) wolves attend specifically to raven food calls as cues for food availability. We address these hypotheses by assessing behaviours related to attention, activity, and heterospecific interactions during feeding events and through a playback experiment isolating wolves' responses to food calls. Findings may contribute to understanding the mechanisms of heterospecific cue use as well as predator - scavenger dynamics in different feeding contexts.

Friends, foes, or indifferent? Vigilance suggests neutral coexistence of chamois and red deer

Vojtěch Kasič, Jitka Bartošová, Luděk Bartoš
Czech University of Life Sciences, Czech Republic

Interspecific interactions have traditionally focused on competition, while neutral or positive effects remain less studied. This is also the case for alpine ungulates such as chamois (*Rupicapra rupicapra*) and red deer (*Cervus elaphus*). Therefore we tested whether co-occurrence affects vigilance between these species in northern Czechia. We conducted 554 hours of scan sampling across 72 days between April and September in 2023–2024. Data were analysed using GLMMs with AIC-based model selection for the dependent variable "Percentage of vigilant individuals". Location and date were random effects. The best model (AIC difference between the best and second best models $\Delta = 15.85$) included fixed effects of herd size (Chamois $\beta = -0.14$, 95 % CI [-0.24, -0.03]; Red deer -0.07, [-0.29, 0.14]; Both -0.10, [-0.18, 0.02]), precipitation (Chamois -0.87, [-4.05, 2.32]; Red deer 26.46, [-16.08, 69.01]; Both -0.99, [-4.34, 2.35] and month in interaction with year (not presented). Other variables showed no effect. Co-occurrence did not alter vigilance, indicating neutral interactions. This contrasts with resource-limited chamois native systems, suggesting that lower-elevation systems may reduce competitive pressures, allowing coexistence. This context-dependent interaction may become relevant as climate-driven range shifts occur as species expand into novel habitats.

Tooling in the tree tops: arboreality may facilitate tool use innovations on unfixed targets in Goffin's cockatoos (*Cacatua goffiniana*)

Anna Elisa Kempf, Alice Marie Isabel Auersperg

Animal Innovation Research, Messerli Research Institute, University of Veterinary Medicine, Austria

The ecological context of innovations may shape which techniques lead to success and how these techniques are discovered. Wild Goffin's cockatoos innovated tooling on Ketapang (*Terminalia catappa*) and Wawai (*Cerbera manghas*) fruit to extract nutritious pulp in two known locations: The Tanimbar islands and Singapore. Using their dexterous beaks, they manufacture and insert stick tools into the fruit while the fruit is held with the foot. The behaviour overlaps with Orangutans tooling on the *Neesia* fruit. As one arm is occupied with stabilizing them in a tree, they manipulate a stick tool with their mouth while pointing the fruit towards the tool with the other hand. We hypothesize that the arboreal context necessitates actively holding and managing an unfixed target. In this study, Goffin's cockatoos naive to tooling on unfixed targets are given an artificial fruit and a wooden stick tool for extraction. We compare Goffin's innovating on an elevated perch to Goffin's innovating on a flat table, expecting Goffin's to innovate faster in the perch setting. To provide detailed insights into how Goffin's adjust their movements to manage spatial relations, we track their motions using Deeplabcut.

Chorus synchrony as a cue: wolves' response to unfamiliar pack howls

Vanessa Kern, Svenja Capitain, Friederike Range

Domestication Lab, Konrad Lorenz Institute of Ethology, Department of Interdisciplinary Life Sciences, University of Veterinary Medicine Vienna, Vienna 1160, Austria

Chorus howls play a central role in wolf social communication, yet it remains unclear whether wolves attend to the structure of incoming howls when assessing unfamiliar packs. We investigated behavioural responses of captive wolves to synchronous and asynchronous chorus howls from unfamiliar packs, compared to a neutral control sound. Nineteen wolf packs were tested using a within-subject playback design. Behaviour was recorded for 15 minutes following the playback and analysed at the group level, with preliminary analyses focusing on the first five minutes post-playback for social aspects. Wolves exposed to synchronous howls showed increased conspecific-directed gazing and reduced distance to conspecifics, whereas asynchronous howls were associated with greater spacing between pack members. These results suggest that howl synchrony may influence wolves' social behaviour, although further analyses are required.

How to use real-time AI for field bioacoustics. Leveraging edge computing when power consumption and data bandwidth are limiting

Arik Kershenbaum¹, Angela Dassow², Holly Root-Gutteridge³

¹University of Cambridge, United Kingdom

²Carthage College, United States of America

³University of Lincoln, United Kingdom

Modern machine learning algorithms have revolutionised bioacoustics, particularly with AI solutions for automatic detection and classification of animal sounds. However, a fundamental bottleneck remains. Large convolutional neural networks need to run on powerful computers with large amounts of memory, but the animal sounds are often in remote, inaccessible areas, with limited data bandwidth. This makes real-time analysis of bioacoustic data almost impossible. Here I will put forward a supplementary approach, based on our work in the jungles of Nepal and Vietnam. Using a paradigm known as "edge computing", as much processing as possible is pushed onto the sensor devices themselves, within the constraints of their memory and power supplies. We perform simple automatic detection on low-power ARM devices, running off a small 20W solar panel, and detection events propagate through a low-powered sub-gigahertz mesh network, across which information flows from devices to device until it can reach a high-bandwidth gateway. Cross platform libraries allow sophisticated machine learning algorithms to be implemented on a variety of lightweight platforms. Distributed low-power processing seems to be a promising option for many remote bioacoustics applications.

Smart control of public lighting as a tool to mitigate the impacts of artificial light at night on insects

Linnea Kivelä¹, Ida-Maria Huikkonen², Ronja Metsänoja¹, Emilia Rajala¹, Anna Suuronen², Vilja Tahvanainen¹, Lotta Unnaslahti¹, Helmi Varjo-Ossa¹, Anssi Vähätalo¹

¹University of Jyväskylä, Finland

²Finnish Environment Institute, Finland

Although the threat posed by artificial light at night (ALAN) on nocturnal insects is increasingly well documented, there is still a critical lack of experimental evidence on whether widely implemented smart public lighting practices can mitigate these impacts without compromising the functional requirements of outdoor lighting. In this work, we aim to evaluate the effectiveness of existing practises and to identify times of high risk when limiting light exposure is most critical. For this purpose, we experimentally evaluate the effectiveness of three smart lighting strategies—part-night lighting, seasonal lighting breaks, and dimming profiles—in reducing insect attraction, using controlled field experiments in real municipal lighting environments. In addition, we evaluate the impact of the time of the year on light attraction of moths at five different latitudinal bands (between 59°N and 69°N) based on over 20 years of survey data. The experiments are conducted in collaboration with municipal lighting professionals and using real streetlights, thus assuring the relevance of the experimental set-up and the direct communication of the results to lighting practitioners.

Insect behaviour along an urban gradient: how do insects respond to artificial light throughout the lunar cycle?

Amine Kousba¹, Qian Tang¹, Imogen Daszak², Timothy Barker Plotkin³, Remi Christiansen⁴, Caroline Dressler¹, Avalon C.S. Owens¹

¹The Rowland Institute at Harvard University, United States of America

²Northeastern University, United States of America

³College of the Atlantic, United States of America

⁴Antioch University New England, United States of America

Artificial light at night (ALAN) and urbanization are increasingly prevalent drivers of global insect declines, partly due to the maladaptive flight-to-light behaviour exhibited by many nocturnal insects. To investigate environmental influences on flight-to-light behaviour, we performed time-gated light trap sampling along three urbanization gradients throughout three lunar cycles in summer 2025. We predicted that (1) insects at rural sites with less light pollution would approach our experimental light source earlier in the night due to a lack of competing ALAN sources, (2) flight-to-light behaviour would increase at lower levels of lunar illumination because the artificial light source would be more visually prominent, and (3) the effects of the lunar cycle would be more pronounced in rural areas where there is less light pollution to obscure natural light cycles. Our results shed light on the environmental determinants of the timing of flight-to-light behaviour and will help inform effective and specific insect-friendly lighting practices to support the conservation of at-risk species in urban, suburban, and rural habitats alike.

Rapid environmental change disrupts cue–outcome mappings, constraining animal behaviour in the Anthropocene

Nishant Kumar

DBT/Wellcome Trust India Alliance Fellow, National Centre for Biological Sciences; Tata Institute of Fundamental Research, Bengaluru, India

THINKPAWS Sustainability Research Foundation, Delhi, India

Department of Biology, Life and Mind Building, University of Oxford, United Kingdom

Rapid environmental change in the Anthropocene exposes animals to novel and often conflicting cues/choices. While classical frameworks such as optimal foraging and risk-sensitive learning assume that available information can be progressively integrated, they rarely consider situations where cue–outcome mappings themselves become unreliable. Drawing on long-term observations and in situ experiments from Delhi's urban ecosystems, I present evidence from black kites, free-ranging dogs, and rhesus macaques showing that behavioural responses vary systematically with the interpretability of cues, even when resource availability and encounter rates remain comparable. Observations during the COVID-19 lockdown further suggest that changes in cue structure can rapidly reshape space use without immediate changes in underlying resources. These findings highlight information resolvability as a potential constraint on decision-making, varying across ecological contexts (aerial, arboreal, terrestrial) and sensory modalities (visual, auditory, olfactory). Gaps between information availability and its usability may decouple individual responses from population-level outcomes in human-modified landscapes.

Affiliative postures of unfamiliar humans influence approach decisions in free-range use dogs

Aesha Lahiri, Srijaya Nandi, Tuhin Subhra Pal, Anamitra Roy, Anindita Bhadra

Department of Biological Sciences, Indian Institute of Science Education and Research, Kolkata, India

Individuals rely on social cues to evaluate beneficial versus harmful interactions making it important to understand cues influencing approach in human–animal interactions. Free-range use dogs frequently interact with humans showing cooperative and conflict-driven behaviours. We studied three affiliative postures identified from habitual human-FRD interactions (standing, bending, squatting) versus a neutral posture, alone or with an affiliative gesture in binary approach trials on 712 FRDs using an independent-groups design; 243 successful approaches were recorded. FRDs approached affiliative postures and gestures significantly more than chance, though overall responses were influenced by behavioural state. Response variables included choice of postural configuration, approach latency, and sociability. Our results show that FRDs exhibit hypersociability and cognitive adaptability in understanding human postural cues. This study suggests that inculcating clear affiliative body language during human–dog encounters may reduce conflicts, promoting coexistence in the urban ecosystem.

Animal curiosity: context, causes and consequences

Megan Lambert

University of Veterinary Medicine, Vienna, Austria

Curiosity – the drive for information – is widely referenced as playing a critical role in behaviour and cognition, but we know surprisingly little about how it operates in other species, including the conditions under which it manifests, what triggers it, and how it impacts decision making. I present a series of studies investigating these topics in nonhuman animals, focusing primarily on the kea parrot (*Nestor notabilis*), a species renowned for its neophilic and explorative nature. We find that the kea's drive to obtain information depends on context and associated energetic or food costs, yet thus far they exhibit limited evidence for selective attention toward stimuli traditionally theorized to elicit curiosity, or more targeted forms of information gathering such as explanation seeking. Such effects may be obscured by the kea's broad and pronounced tendency to explore, which may reflect an adaptive response to the unpredictable resource availability and dynamic environmental conditions they face in nature.

Out of sight, not out of mind: object permanence, camouflage, and information-seeking behaviour in cuttlefish

Willa Lane, Peiru Chen, Francesca M. Cornero, Nicola S. Clayton

University of Cambridge, United Kingdom

Object permanence (OP), the knowledge that hidden objects continue to exist, is a foundational cognitive capacity supporting flexible behaviour in an increasingly unpredictable world. While well-established in vertebrates, OP remains underexplored in invertebrates. As visually driven ambush predators with complex cognitive abilities, coleoid cephalopods are compelling candidates, but their sit-and-wait hunting style means standard manipulation-based OP paradigms may be unsuitable. Dynamic camouflage provides a readout of perceptual and internal states, offering a natural toolkit for adapting existing OP paradigms to this animal group. We tested cuttlefish (*Sepia officinalis*, n=19) for OP using species-typical hunting camouflage as a novel measure. Several individuals showed responses toward occluded prey normally elicited by visible prey, including hunting camouflage, active searching, and hunting strikes: even out of sight, prey is not out of mind. These findings provide preliminary evidence for OP in cuttlefish, suggesting independent evolution of this capacity in cephalopods as well as demonstrating the utility of dynamic camouflage as a tool to study cephalopod cognition.

The impact of anthropogenic noise on the howling behaviour of mantled howler monkeys (*Alouatta palliata*)

Megan Layton¹, Carolina Orozco Zamora², David Lee¹, Emma Higgins¹, Tracie McKinney¹

¹University of South Wales, United Kingdom

²National System of Conservation Areas Costa Rica (SINAC) & Biological Corridor Peninsular

The function of loud howls by mantled howler monkeys is heavily disputed and has been hypothesised to be for resource guarding, group cohesion, predator avoidance or sexual signalling. This species has a high behavioural plasticity and can occur in small forest fragments of human dominated landscapes and therefore subjected to high levels of anthropogenic noise disturbance. In this study we compared vocalisations from Costa Rican Forest edges, the western side of Cabo Blanco Absolute Natural Reserve used as a control as it has little to no anthropogenic disturbance, whilst forest edges alongside roads found within the towns, situated outside the reserve have high levels of anthropogenic noise, including traffic and construction. Vocalisations were recorded using audio moths as a non-invasive sampling method, as loud howls can travel up to 2km. Each site had 3 audio moth locations, recording from 4am to 7pm, collecting over 300 hours of recordings per site. Results have shown differences in howling behaviour, with time-of-day howling bouts occurred and bout length and how traffic noise can onset a howling bout. While the impact of habitat differences on mantled howler monkey vocalisations is documented, little is known about the influence of anthropogenic on their vocalisations.

Inverse lactation: larval secretions control reproductive division of labour in ants

Adria LeBoeuf, Helder Hugo, Nadine Anders, Yuqi Reitsema-Wang, Jean-Jacques Rafanomezantsoa, Bas Teusink, Brian L. Fisher, Adria C LeBoeuf

University of Cambridge, United Kingdom

Social fluids typically flow from adults to offspring, with milk being the iconic example. Here we describe the reverse: in the ponerine ant *Platythyrea mocquerysi*, larvae provision adults through a specialised tubercle, and access to this "inverse lactation" determines which adult can act as reproductive. *Platythyrea* colonies often lack morphological queens. Instead, reproductive division of labour emerges dynamically among totipotent workers. We asked how reproductive roles are established in this system. Combining controlled experiments manipulating larval access with automated behavioural tracking, proteomics and transcriptomics of larval secretions, and electron microscopy of internal morphology, we found that access to larval tubercle secretions enables reproductive activation: only individuals with access to larvae initiated egg laying. Those engaging more frequently in larval feeding laid eggs faster, lived longer, and exhibited more brood care. Both larvae and adults feed on prey, yet reproductives appear to shortcut their own metabolic costs by co-opting larval metabolism. These findings reveal larvae as gatekeepers of adult reproductive status and demonstrate a novel form of metabolic division of labour: rather than reproductives receiving processed food from helpers, they extract resources directly from developing brood, extending their own lifespan in the process.

Flexibility in diel activity: the differential effects of domestic and tourist disturbance on the temporal patterns of spotted hyenas (*Crocuta crocuta*)

Sarah McKissack¹, Erin Connolly², Holly Pringle², Kate Jones², Jacob Dunn¹

¹Anglia Ruskin University, United Kingdom

²University College London, United Kingdom

Rapid human population growth and anthropogenic land-use expansion have been linked to a broad spectrum of responses in wild animals, ranging from avoidance to tolerance to attraction. These responses are heavily context- and species-dependent, underscoring the importance of their study for effective conservation strategies. This study investigated whether the diel activity of a behaviourally flexible large carnivore, the spotted hyena (*Crocuta crocuta*), shifts in response to two forms of anthropogenic disturbance in Kenya's Greater Maasai Mara Ecosystem. Here, retaliatory killings and poaching pose mortality risks to spotted hyenas that are typically associated with domestic but not tourist activity, the latter being restricted to wildlife viewing. Data from 97 camera traps, active during the 2019 dry season, was used to model diel activity across gradients of proximity to domestic and tourist infrastructure. A temporal avoidance response specific to higher-risk areas was identified: diel activity shifted towards nocturnal and crepuscular periods as proximity to domestic, but not tourist, infrastructure increased. Temporal activity patterns also shifted with changes in moonlight availability and daily temperature. The ability to respond flexibly to risk and environmental conditions, and to develop tolerance towards low-risk human presence, may be critical to the persistence of spotted hyenas within human-dominated landscapes.

Behavioural traditions and adaptations to an anthropogenic landscape in the Gibraltar Barbary macaques (*Macaca sylvanus*)

Martin Nicourt¹, Sylvain Lemoine²

¹Muséum National d'Histoire Naturelle (MNHN), Paris, France

²Department of Archaeology, University of Cambridge, United Kingdom

Human-primate interfaces (HPI) create new environmental niches, foraging opportunities and challenges for the alloprimates, that can drive behavioural changes. Primate behavioural flexibility allows them to thrive in these novel environments, through adaptive behavioural modifications that diffuse in a population by social learning. Challenges drive adaptive responses, while opportunities and presence of human artefacts can drive the emergence of hedonist non-adaptive innovations. Here, focusing on the Barbary macaque (*Macaca sylvanus*) population from Gibraltar, we present two examples of behavioural changes that emerged within an anthropogenic landscape, that are socially transmitted and present local variation, representing local traditions: geophagy and shiny reflective object manipulation (SROM). Geophagy corresponds to an adaptive respond to changes in diet and is strongly associated with high levels of human-macaque interactions. On the other extreme of the innovation spectrum, SROM, a non-adaptive hedonist behaviour, is associated with the lowest level of interactions with humans. In HPI, constraints and opportunities can then catalyse new behaviours and traditions.

The position and role of weak links in rhesus macaque social networks

Giovanni Leonardi¹, Diogo L. Pires^{2,3}, Sune Lehmann^{2,3}, Lauren J.N. Brent⁴, Josefine Bohr Brask²

¹University of Copenhagen, Denmark

²Copenhagen Center for Social Data Science (SODAS), University of Copenhagen, Denmark

³DTU Compute, Department of Applied Mathematics and Computer Science, Technical University of Denmark (DTU), Denmark

⁴Centre for Research in Animal Behaviour, University of Exeter, UK

Weak links in social networks have been hypothesised to be of high importance for network connectivity and information transfer. They have therefore been investigated extensively in the social sciences. Nevertheless, despite their potential importance, weak links have been rarely explored in animal societies. The aim of this study is to investigate the position and role of weak links in animal networks. First, we research whether their position depends on the traits of individuals. Secondly, we investigate their network centrality to assess their role in connecting different network parts. We study a free-ranging population of rhesus macaques living in social groups with variation in the strength of social bonds. The networks are built with a Bayesian framework accounting for uncertainty on edge weights. Edges are classified into weak and strong by applying mixture models. In our analysis we investigate the effect of gender, rank and age difference on the likelihood of forming weak links. Then, we analyse whether weak and strong links differ in terms of edge betweenness. The preliminary results suggest that the likelihood of weak links depends on rank, and weak and strong links do not have different structural roles. This suggests that the importance of weak links in rhesus macaque societies may lie in information transfer between ranks, rather than network connectivity.

Enhancing canine welfare in the Anthropocene: the impact of environmental enrichment on stress and social interactions in urban pet parks

Ying-Hsuan Lin, Hsiang-Ching Huang

Department of Landscape Architecture, Fu Jen Catholic University, Taiwan

In the Anthropocene, urban dog parks have become vital social hubs for domestic dogs. However, human-centric designs often neglect canine behavioural needs, leading to stress and bullying during high-density interactions. This study examines whether specific environmental design interventions can reduce stress and conflict in off-leash parks. Using an experimental design at two large-scale sites (Yingfeng and Xinzhuang Pet Parks), we tested enrichment modules placed near entrances. These modules included olfactory stimuli (herbal plant boxes), micro-topography (raised platforms with artificial turf), and visual targets (hanging chew toys). Recordings of 120 behavioural clips (1–2 mins each) during peak hours were randomly assigned and evaluated by eight certified behaviour experts; each clip was evaluated by 3 experts using a structured stress scale, attachment, and bullying frequency indicators. Results showed that the stress behaviours were significantly decreased from 1.95 ± 0.57 to 1.32 ± 0.27 , ($t(118) = 7.63$, $p < .01$). In addition, attachment score was reduced from 1.81 ± 0.45 to 1.31 ± 0.28 , ($t(118) = 7.37$, $p < .01$), and bullying score was significantly decreased from 2.39 ± 1.24 to 1.27 ± 0.72 , ($t(118) = 6.01$, $p < .01$). Our findings confirm that multi-sensory and structural enrichment modules significantly enhance canine welfare and foster social stability in shared urban spaces.

Play with aspects: disentangling how kinematic, social, and spatial play shape physiology, sociality, and cognition

Quanxiao Liu¹, Marek Špinka^{1,2}

¹Charles University, Czech Republic

²Czech University of Life Sciences Prague, Charles University, Czech Republic

Play is present across the animal kingdom and widespread in mammals. Although the amount of play is known to profoundly affect physiological, social, and cognitive development, which aspects of play drive which effects remain unclear. To address this, we paired post-weaning laboratory rats and allowed them to play with restricted kinematic, social, or spatial aspects. Then, we assessed their physical performance, social competence, and spatial memory in young adulthood. Rats in single-layer cages performed worse crossing challenging surfaces, rats with restricted motor play forgot spatial cues more rapidly, and rats paired with non-playful mates escalated fights more often with unfamiliar conspecifics. Our results suggest that disentangling the aspects of play can help achieve a coherent understanding of animal play. Understanding play is not only crucial for behavioural ecology, captive management, and animal welfare, but also especially relevant for our society, as children's play has shifted drastically toward reduced kinematic, spatial and direct social engagement, with potential developmental consequences we need to understand.

Personality and cognition: the dynamic duo in biological invasions

Tsz Hin Lo¹, Ross Cuthbert¹, Jaimie Dick¹, James Dickey², Gareth Arnott¹

¹Institute for Global Food Security, School of Biological Sciences, Queen's University Belfast, Belfast, Northern Ireland, United Kingdom

²HUN-REN Centre for Ecological Research, Budapest, Hungary

Biological invasions are a major global ecological threat, dominantly driven by human activities such as the global pet trade. In particular, the ornamental fish trade is a prominent pathway for freshwater fish invasions. Animal personality is increasingly recognised to be an important factor that influences invasion success. Moreover, it has been suggested that personality and cognition are intrinsically correlated. The aim of this project is to (i) shed light on how personality traits (e.g. boldness, aggression, neophilia and exploration) and cognitive abilities (e.g. learning and reversal learning ability) may influence invasion success; (ii) elucidate the relationship between personality and cognition. Here we are conducting a series of behavioural and cognitive tests (i.e. open field tests, novel object tests, startle tests, mirror aggression tests, associative learning and reversal learning tests) using invasive freshwater species, convict cichlids (*Amatitlania nigrofasciata*) and a closely related species with no documented invasion history, T-Bar cichlids (*Amatitlania sajica*), as the comparative model for this project. PCA was conducted to summarise the behavioural variables from behavioural tests. To date, our results suggest that *A. sajica* is bolder than *A. nigrofasciata*, surprisingly. Overall, this research will provide a unique insight into how personality and cognition influence their invasive potential and better position us to protect native ecosystems.

Pigs open doors for conspecifics: a multi-site evaluation of pro-social behaviour

Alvaro Lopez Caicoya¹, Kaleiah Schiller², Marie Bordes², Jean-Loup Rault², Liza R. Moscovice¹

¹Animal Behaviour & Husbandry competence area, Research Institute for Farm Animal Biology (FBN), Dummerstorf, Germany

²Animal Welfare Science Unit, University of Veterinary Medicine Vienna (VMU), Vienna, Austria

Helping behaviour is usually interpreted as a proxy for empathy in non-human animals. We tested 239 pigs across two sites (FBN, VMU) in standardised set-ups. Stable groups of ten pigs had access to two attached compartments, openable only from the home pen. Each pig was individually trapped in one of the compartments under a low or high stress treatment, involving either a brief or long separation from the group before being trapped. The remaining nine pen-mates could choose to open the door for the trapped pig, the door for an empty compartment, or neither. Although pigs at both locations opened the trapped pig's door at high frequencies (~80%), at only one site did pigs open the empty compartment door at significantly lower rates ($p < 0.01$). Across both locations, when pigs decided to open a door, the latency to open the trapped pig's door was significantly shorter than for the empty compartment ($p < 0.01$). While the high-stress treatment resulted in elevated salivary cortisol levels in trapped pigs ($p < 0.01$), it did not affect the likelihood or latency of door opening. Notably, pen-mates' prior proficiency in opening doors significantly predicted openings ($p < 0.01$). By combining physiological measures, behavioural controls, and multi-site replication, our findings caution against premature interpretations of empathy.

Addicted to pollution? Caffeine drives attraction and altered locomotor performance in a freshwater fish

Léa Lorrain-Soligon¹, Simon Agostini², Beatriz Decenci  re², Emmanuel Dubillot³, Christel Lefran  ois³, Alexis Millot², Aur  lie Goutte¹

¹Sorbonne Universit  , Universit   PSL, EPHE, CNRS, Milieux Environnementaux, Transferts et Interactions dans les hydrosyst  mes et les Sols, METIS, F-75005 Paris, France

²Centre de recherche en   cologie exp  rimentale et pr  dictive (CEREEP-Ecotron IleDeFrance), D  partement de biologie, Ecole normale sup  rieure, CNRS-UAR 3194, PSL University, 77140 Saint-Pierre-l  s-Nemours, France

³Littoral Environnement et Soci  t  s (LIENSs), UMR 7266, CNRS-Universit   de La Rochelle, 2 rue Olympe de Gouges, F-17042 La Rochelle Cedex 01, France

Widespread neuroactive contaminants such as caffeine are released into aquatic ecosystems, with the potential to alter animal behaviour. In this study, we investigated the effects of caffeine on locomotor activity and habitat choice in the European chub (*Squalius cephalus*). Fish were orally pre-exposed to caffeine or control conditions and subsequently tested for locomotor performance under control and caffeine-contaminated water, followed by a two-choice assay (choice tank) allowing free movement between both environments. We showed higher maximal speed and average acceleration in fish previously exposed to caffeine, but only in caffeine-contaminated water. Moreover, caffeine-exposed fish spent significantly more time in the caffeine compartment during the choice tank assay. These results suggest that prior exposure alters both neurophysiological responses and habitat selection, increasing the likelihood of occupying contaminated environments. Our findings demonstrate that caffeine can modify fish behaviour at ecologically relevant concentrations. The attraction to contaminated waters we observed may increase long-term exposure and contribute to maladaptive behavioural responses.

Song complexity and cognitive ability are not consistently related in the pied flycatcher (*Ficedula hypoleuca*)

Lan Ma, Mario Gallego-Abenza, Miriam Kuspiel, Samyuktha Rajan, David Wheatcroft

The Wheatcroft Lab, Department of Zoology, Stockholm University, Sweden

Sexual selection has produced diverse male ornaments and signals, yet understanding why females prefer particular traits and what benefits they gain from those preferences remains a central challenge in evolutionary biology. Song complexity is one such trait linked to female preference in songbirds, and has been hypothesized to signal cognitive ability, a quality difficult for females to assess directly. We tested this hypothesis in wild pied flycatchers by measuring associations between four song complexity variables and performance on a novel foraging task and a detour reaching task in breeding males. Contrary to our prediction, repertoire size and syllable switching rate, the complexity measures most consistently linked to female preference in this species, both negatively predicted success on a novel foraging task. Within-individual variability in versatility, a previously unstudied song trait, positively predicted detour reaching success. No other song complexity variable predicted cognitive performance after correction for multiple comparisons, and cognitive performance showed no consistent cross-task associations. Our findings suggest that the song measures females attend to in pied flycatchers do not reliably signal cognitive ability, and that female preference for complex song is more likely maintained as a multicomponent honest signal of overall male quality.

Neophobia in urban and rural blue tits

Julia Mackenzie¹, Caglar Akcay¹, Andrew Smith¹, Rachael Miller², Emily Danby³, Gabrielle Davidson⁴, Nicola Clayton⁵

¹Anglia Ruskin University, United Kingdom

²University of Exeter, United Kingdom

³Scottish Government, United Kingdom

⁴University of East Anglia, United Kingdom

⁵University of Cambridge, United Kingdom

Neophobia—fear of anything new—is widespread in animals and can be adaptive, e.g. balancing the risks of predation against lost foraging opportunities. In increasingly human dominated landscapes, urban birds are exposed to novel objects, sounds, and foods on a regular basis, potentially altering neophobic responses relative to rural populations. This study explored behavioural responses to novel objects and novel sounds in wild Eurasian blue tits (*Cyanistes caeruleus*) at an urban (city centre botanic garden) and a rural (small woodland) during the breeding season. Birds at both sites showed neophobic responses, with slower returns to the nest box in the presence of novel stimuli compared to control conditions. However, habitat context modulated these responses. Rural birds returned more slowly and reduced visit rates under novel conditions relative to urban birds, despite similar behaviour across sites during control trials. Responses to treatment type also differed by site, with rural birds responding similarly to novel sounds and objects, whereas urban birds showed a modest response to novel objects but little change in response to novel sounds. Individual birds at the rural site showed high repeatability in responses to novel objects, while repeatability at the urban site was low. Overall, these results indicate that neophobic responses in blue tits vary with habitat context. Birds at both sites had neophobic responses, but urban birds responded less strongly to novelty than rural birds and showed lower behavioural repeatability. Differences in behavioural repeatability across sites may reflect contrasts in environmental predictability, rather than behavioural flexibility.

From dusk till dawn: light-driven changes in aggressive communication are sex-based in a group-living cichlid

Maria Maclaren, Perran Steward, Selvino R. de Kort, Joachim G. Frommen

Manchester Metropolitan University, United Kingdom

Sociality relies on the availability and detection of sensory information. In group-living animals, social structures are shaped by communication and aggression. Overt attacks are energetically costly and increase risk of injury or death. Escalation is therefore commonly preceded by aggressive signalling. These signals are often based on visual cues, which are detected less effectively with lowering light intensity. The link between community dynamics and changing light conditions is understudied, leaving our understanding "in the dark". We compared aggressive events between bright daylight and dim night conditions in *Neolamprologus similis*, a group-living, harem cichlidfish. Overt aggression was higher in males and decreased similarly in both sexes under dim conditions. The amount of visual aggressive signals was similar in both sexes and decreased in dim light, especially in males. Tail-beating, a non-visual signal directed at an opponent's lateral line, was higher in females and showed no response to light changes. Our results illuminate how changes in sensory information alters communication and how sexes differ in their response, based on the species' social structure.

Evaluating soundscape enrichment as a tool for European flat oyster (*Ostrea edulis*) restoration

Jonny Magnay

University of Glasgow, United Kingdom

A near-universal collapse of European flat oyster (*Ostrea edulis*) populations over recent centuries has resulted in widespread loss of functionally important marine habitats. Despite ambitious restoration efforts, the recovery of many degraded systems remains limited by the settlement of oyster larvae onto suitable habitat. Recent advances in ecoacoustic restoration technologies demonstrate that enriching local soundscapes using settlement-inducing sound playbacks can enhance larval settlement in some oyster species. However, major knowledge gaps limit their use in European ecosystems. To investigate the response of European flat oyster larvae to soundscape enrichment, we used experimental playbacks of oyster bed noise alongside paired ambient controls in aquacultural spatting pools and marine field sites. Settlement and recruitment rates under ambient and enriched soundscapes were compared, with behavioural monitoring and community sampling used to explore effects on non-target organisms. Enriched soundscapes are expected to enhance larval settlement, although concurrent biodiversity changes may influence oyster recruitment through shifts in predation and competition. These results will help establish whether soundscape enrichment is an effective complementary method of oyster restoration for use alongside existing frameworks.

Rhythmic choices: investigating temporal preferences in zebra finches

Marco Maiolini^{1,2} and Michelle J. Spierings^{1,2,3}

¹Behavioural Biology, Institute of Biology Leiden, Leiden University, Leiden, The Netherlands

²Leiden Institute for Brain and Cognition (LIBC), Leiden University, The Netherlands

³Department of Behavioral and Cognitive Biology, University of Vienna, Vienna, Austria

Rhythmic patterns, defined as elements occurring in a specific class of intervals, are a fundamental feature of communication systems and music across cultures. In humans, such patterns occur in both musical production and rhythmic preferences, highlighting a mirroring between rhythmic production and perception. Similar patterns are widespread in animal vocalisations, yet whether rhythmic production aligns with rhythmic preferences remains unknown in non-human animals. In this framework, the highly structured song of zebra finches (*T. castanotis*) is of particular interest. In this species, only the male sings, and the song is made of repeated motifs learned by the tutee from their tutors during the critical period. The song has been reported as isochronous with a shared rhythm between tutee and tutors, making this species highly suitable for investigating whether a general rhythmic preference exists in this species and if it aligns with the rhythmic production. Here, we inspected the preference for different rhythmic patterns in zebra finch songs using a two-choice and a four-choice preference test. Our results show that zebra finches do not have a general preference for a rhythmic pattern, but rather an individual rhythmic preference, suggesting rhythmic patterns are not universally preferred across taxa and might be shaped by species or individual biases.

Forever chemicals, forever effects? Exploring the impacts of pre-natal PFAS exposure on social behaviour in waterfowl

Lisandrina Mari¹, Silje Peterson², Claire Bottini², Maria Dulsat-Masvidal², Domnin Gachet², Martine Furuly Guldbrandsen³, Hanna Rosti⁴, Sajjad Vakili², Veerle Jaspers³, Céline Arzel²

¹University of Jyväskylä, Finland

²University of Turku, Finland

³Norwegian University of Science and Technology, Norway

⁴University of Helsinki, Finland

Per- and poly-fluoroalkyl substances (PFAS) are compounds with extreme persistence in the environment that present an urgent health concern due to their endocrine disrupting properties. Waterfowl populations have been declining globally, and PFAS have been detected in increasing concentrations in their eggs over the past decades. Though this suggests potentially worrying developmental effects, our knowledge on PFAS effects beyond toxicity is scarce, particularly at the neurological and behavioural levels. I will present recent results from a controlled experiment in which we exposed mallard (*Anas platyrhynchos*) in ovo to three PFAS compounds and their mixture. As there is an increasing mortality of young waterbirds due to predation in the Baltic region, we hypothesized here that PFAS, as endocrine disruptors, can 1) dampen fear responses and 2) disrupt social behaviour, reducing group synchrony and reaction time, thereby making ducklings more vulnerable to predator threats. Our work highlights the importance of assessing the consequences of early-life contaminant exposure on social and antipredator behaviours, and emphasizes the potential for behaviour to inform ecotoxicology studies.

Wolves responses to novelty, human- and dog-like cues. Does living closer to people matter?

Sarah Marshall-Pescini¹, Martina Lazzaroni², Rudy Brogi³, Francesca Brivio¹, Friederike Range¹, Marco Apollonio³

¹Domestication Lab, Konrad Lorenz Institute of Ethology, Department of Interdisciplinary Life Sciences, University of Veterinary Medicine, Austria

²Department of Chemistry, Life Science and Environmental Sustainability, University of Parma, Italy

³Department of Veterinary Medicine, University of Sassari, Italy

Behavioural flexibility is considered one of the most effective ways for animals to persist in urbanized environments, allowing rapid adjustment to human-dominated landscapes. Here, we experimentally tested how urbanization affects fear- and interest-related behaviours in free-ranging grey wolves. We tested 185 individually identified wolves across 44 locations in central Italy spanning a broad urbanization gradient (Human Footprint Index: ~10–44). Wolves were exposed to (i) novel objects, (ii) a dog-like model (and control magpie), and (iii) acoustic playbacks of human voices (and control birdsongs). Wolves from more urbanized areas were less likely to show fear during initial exposure to a novel object. However, when a slightly different object was introduced, urban wolves showed renewed caution, whereas wolves from less urbanized areas generalized their reduced fear. All wolves behaved more socially towards the model dog than the control magpie, but no effect of urbanization emerged. Human voices elicited strong fear responses in over 80% of observations regardless of urbanization. Across tests, wolves habituated rapidly, and sociality consistently buffered fear responses. Urbanization does not lead to a simple reduction in fearfulness. Instead, wolves flexibly modulate responses depending on cue type and social context. This behavioural plasticity likely underpins their capacity to persist in human-dominated landscapes.

When behaviours share physiology: socially transferred materials as channels for evolutionary innovations

Arthur Matte, Adria C. LeBoeuf

University of Cambridge, United Kingdom

Socially transferred materials (STMs) are fundamental drivers of evolutionary innovation, underpinning major life-history strategies in reproduction, parental care, and complex cooperation. Drawing on diverse taxa, we will explore the ecological and morphological conditions that facilitate or constrain the origins and elaboration of STMs. To understand the molecular evolution underlying the emergence of STMs, we employed phyloproteomics and comparative genomics to compare ant crop contents across behavioural transitions, revealing how ants repurposed their digestive fluid into a highly specialized medium for social exchange. Finally, we place these evolutionary trajectories into the context of global environmental change. Because STMs are intimately linked to fitness, understanding how anthropogenic stressors threaten to disrupt their production, transmission, and reception is crucial for predicting species adaptation and vulnerability in a rapidly changing world.

Admixture effects on thermal performance traits in the invasive common wall lizard

Keya Matthew¹, Miary Raselimanana¹, Joana Meier², Aaron Comeault¹, Kirsty MacLeod¹

¹School of Environmental and Natural Sciences, Bangor University, United Kingdom

²Wellcome Sanger Institute, United Kingdom

Anthropogenic change is a catalyst for environmental invasions, allowing species to colonise novel environments and threaten local flora and fauna in the process. Successful invasions may require adaptation to local conditions, including significant climatic shifts. Behavioural variation can facilitate persistence and high fitness in introduced ranges, but whether behavioural variation relevant for fitness is genetically controlled remains poorly understood. This study uses the invasive common wall lizard (*Podarcis muralis*) in the UK as a model ectotherm to understand how adaptive behavioural variation is genetically controlled. Wall lizards have had multiple introductions into the UK from their native range across Europe, creating opportunity for genetic mixing of previously distinct and isolated populations (genetic admixture), contributing to phenotypic variation. Here we investigate how thermoregulatory behaviour and body condition in response to hibernation conditions are influenced by genetic variation in ancestry among introduced individuals. Ultimately our study quantifies the role of admixture in generating phenotypic variation that help contribute to successful invasions.

Impacts of pharmaceutical pollutants on fish behaviour in complex social and spatial environments

Erin McCallum, Aneesh Bose, Tomas Brodin, Natalia Sandoval Herrera, Gustav Hellström, Daniel Cervený

Swedish University of Agricultural Sciences, Sweden

Pharmaceuticals have become widespread environmental pollutants in urban freshwaters. Certain pharmaceuticals, like antidepressants or anxiolytics, have been shown to alter a range of fish behaviours following laboratory exposures. However, ecotoxicological studies in the lab often expose individual fish in simple tanks that overlook the natural spatial and social complexity that fish would experience in the wild. I will present findings from two experiments assessing how anti-anxiety benzodiazepines affect fish behaviours in increasingly complex and naturalistic social and spatial environments – and what consequences this has for their survival and reproduction. Using acoustic telemetry, we show that roach exposed in an experimental lake have altered swimming speed and habitat use, but less impact on predator-prey interactions between the roach and predator pike. In the laboratory, we show how exposure impacts territory formation, aggression, and reproductive success in naturalistic social groups of African cichlids. These studies allow us to close a long-standing research gap and empirically test how subtle, sub-lethal changes to behaviour caused by pollution can ultimately affect animal fitness.

Cognitive attention bias as a measure of wild bird welfare

Lucinda Mellish, Oliver Burman, Tom Pike

School of Natural Sciences, University of Lincoln, United Kingdom

Affective states such as pleasure, pain, and fear, influence animal behaviour and decision-making and hence are likely to reflect responses to anthropogenic challenges. However, the affective state of free-living wild animals has rarely been assessed. To understand wild animal welfare, the current project investigated the affective states of wild birds living in urban versus rural environments. Affective state was measured using a cognitive attention bias task alongside general behaviour observations and flight initiation distances. There was no significant difference between urban and rural birds in their escape latencies in attention bias tests or in their flight initiation distances. This could indicate that anthropogenic activity has minimal impact on the affective state of wild birds, although further research is needed to explore a wider variety of urban, suburban and rural locations in order to consider how specific aspects of the environment may impact affective state.

Anthropogenic exposure influence participation and food consumption in vervet monkeys

Stephanie Mercier¹, Colleen Downs¹, Erica van de Waal², Jürg Gertsch³, Yossi Tam⁴, Sofia Forss⁵

¹University of KwaZulu-Natal, South Africa

²University of Lausanne, Switzerland

³University of Bern, Switzerland

⁴The Hebrew University of Jerusalem, Israel

⁵University of Zurich, Switzerland

Animals living in urban environments are frequently exposed to anthropogenic food that cannot be found in the wild. To assess anthropogenic exposure on feeding habits in two populations of vervet monkeys (*Chlorocebus pygerythrus*), we conducted 55 food experiments with a novel food item (a small ball of corn starch, named pap). We checked the influence of field site (wild population IVP vs semi-urban one UVP) and age-sex class on two factors: 1) motivation to participate, and 2) food consumption of the participants. While semi-urban monkeys were more likely to participate than the wild ones, juvenile males were the only age-sex class that consistently participated in both field sites. Within the participants, the consumption differed primarily across field site as 67% of the semi-urban monkeys ate the pap, whereas the wild ones overwhelmingly rejected it despite inspecting it. To assess dietary experience, we further used previous eDNA results from faecal samples collected at both field sites (Brun et al 2022 & Felsch et al 2026). Despite wild and semi-urban populations primarily fed on a wide variety of plants, only the semi-urban one had access to anthropogenic food. Together, these findings suggest that previous experience predicts participation and acceptance of novel foods. Our results thus highlight the importance of dietary history in shaping primate feeding habits.

A large-scale study across the avian clade identifies ecological drivers of neophobia

Rachael Miller¹, Jimena Lois-Milevicich², Vedrana Šlipogor³, Kai R. Caspar⁴, Carl Soulsbury⁵, Claudia Mettke-Hofmann⁶, Megan Lambert⁷

¹Faculty of Environment, Science and Economy, University of Exeter, United Kingdom

²University of Buenos Aires, Faculty of Exact and Natural Sciences, Argentina

³University of Lausanne, Department of Ecology and Evolution, Switzerland and Innovation and Research Centre Lausanna & Sion, the Sense, Switzerland

⁴Heinrich-Heine-University Düsseldorf, Department of Cell Biology, Germany

⁵Lincoln University, School of Natural Sciences, United Kingdom

⁶Liverpool John Moores University, School of Biological and Environmental Sciences, United Kingdom

⁷University of Veterinary Medicine Vienna, Messerli Research Institute, Austria

The ManyBirds Project is a big team science network uniting 120+ collaborators across 75+ institutions and 24 countries worldwide to advance open, comparative research in avian cognition and behaviour. Our ethos emphasises accessibility, transparency, replicability and inclusivity through large-scale, multi-site collaborations. Our first major empirical study (MB1) in PLOS Biology (ManyBirds Project et al, 2025) investigated the ecological drivers of neophobia, i.e. aversion to novelty, using standardised protocols across 1,400+ subjects, 130+ bird species and 25 taxonomic orders. We found consistent individual and species differences, with key factors such as diet specialisation and migratory behaviour predicting neophobia, supporting the Neophobia Threshold and Dangerous Niche hypotheses, and showcasing the potential of big team science to address long-standing questions. Our second neophobia paper will delve deeper into the evolutionary correlates of neophobia, with pre-registered analyses of the MB1 dataset, including the tempo of evolutionary change in neophobia and influence of life history factors (e.g. longevity, developmental speed, reproductive strategy). Concurrently, ManyBirds is developing new projects on problem-solving/ innovation and executive function. We welcome new collaborators: www.themanybirds.com

Snapping under pressure: the role of anthropogenic noise in fish stress on marine protected areas

Riley Beach¹, Reese Miller^{1*}, Craig Radford², Dennis Higgs¹

¹University of Windsor, Canada

²University of Auckland, New Zealand

Australasian snapper (*Chrysophrys auratus*) is a commercially managed fish species found in abundance within the Hauraki Gulf Marine Park (HGMP), a multi-use marine protected area (MPA) off the coast of New Zealand, with major shipping lanes and high small-boat ownership. Marine protected areas are established to protect ecosystems from anthropogenic disturbances and preserve biodiversity and while they have proven effective at protecting fish populations from most anthropogenic disturbances, they do not directly protect fish from noise, as levels often go unregulated. Using baited underwater videos, we will explore the behavioural differences of Australasian snapper on and off marine protected areas in response to artificially generated boat noise and actual boat motors. The results of this study will provide a direct comparison between speakers and motor noise, and preliminary results suggest that noise generated from boat motors caused stronger behavioural responses than noise generated from speakers. By analysing responses of free-swimming fish in the MPA we hope to test the efficacy of current regulations to determine if additional protections are warranted.

Oestrus phase matters: changes in social behaviour and stress responses in female guinea pigs during the ovarian cycle

Matthias Nemeth, Carina Siutz, [Eva Millesi](#)

Department of Behavioral and Cognitive Biology, University of Vienna, Austria

The oestrous cycle of female mammals involves changes in steroid hormones such as oestrogen and progesterone and their metabolites. These changing hormone concentrations have been demonstrated to influence a variety of behaviour, including general activity patterns, social behaviour and stress responses. The guinea pig with its long 16-day oestrous cycle including an active luteal phase is an excellent model organism to study such effects. The day of oestrus can easily be identified by visual inspection of the vaginal opening. During the last years we conducted several studies investigating effects of different oestrous phases on female behaviour and physiology. Intraindividual comparisons were applied to determine oestrus effects, but also to identify individual consistencies, probably based on personality traits. A highly robust pattern in all studies was a drop in body mass and elevated saliva cortisol concentrations around oestrus. Higher basal metabolic rates further underlined the energetic demands during this period. Social behaviour changed in that oestrous females behaved more aggressively in their housing groups and showed more interest towards conspecifics in social tests. In addition, stress responses were less pronounced in oestrous females, probably related to their elevated basal stress levels. Other behavioural aspects, however, were highly repeatable, irrespective of the cycle phase, indicating different behavioural phenotypes. In general, these results highlight the importance of considering a female's oestrous phase in behavioural studies.

Heatwaves on reproduction and sexual selection: cryptic and transgenerational effects

Chiara Morosinotto

University of Padova, Italy

Heatwaves are extreme climatic events driven by climate change and rank among the most serious threats to biodiversity. Sublethal effects of heatwaves on reproduction can have crucial yet cryptic consequences for animal populations. While the most visible impact is reduced fertility, more cryptic effects such as modifications of reproductive traits, parental effects, behaviour, and sexual selection processes, may also occur. Highlighting the mechanisms through which heatwaves alter sexual selection processes and sex traits is essential for estimating the impacts on populations. By altering parental effects, heatwaves also have the potential to trigger transgenerational effects. If stress-mediated parental effects modify sex traits, reproductive output, and behaviour in offspring, these effects may persist across generations. Preliminary evidence from diverse systems shows that heatwave-exposed parents produce offspring with altered reproductive output and sex traits. By influencing traits linked to mating success, heatwave-mediated effects may have far-reaching ecological and evolutionary implications, extending the impact of climate extremes well beyond directly exposed individuals.

Meerkat markets: how variation in sentinel demand influences cooperative trades

Amy Morris-Drake¹, Lauren Vane¹, Thomas Flower², Tim Clutton-Brock³, Marta Manser⁴, Andy Radford¹

¹University of Bristol, United Kingdom

²Capilano University, Canada

³University of Cambridge, United Kingdom

⁴University of Zurich, Switzerland

When the same individuals regularly interact, group members can trade cooperative behaviours. In such biological markets, animals trade both the same commodity (e.g. grooming for grooming) and different commodities (e.g. sentinel behaviour and grooming). But experiments investigating how variation in supply and demand influence cooperative trades are lacking. We used field-based playbacks in meerkats (*Suricata suricatta*) to test for a link between sentinel behaviour and grooming, and whether an elevation in predation risk increases rewarding of sentinel behaviour. During 3-h sessions, the perceived sentinel contributions of a focal individual were either up-regulated (surveillance-call playback) or unmanipulated (close-call playback). In conjunction, predation risk was either elevated (heterospecific alarm-call playback) or unmanipulated (heterospecific non-alarm playback). There was no evidence for a link between sentinel behaviour and grooming. Moreover, there was no evidence that increased predation risk resulted in increased tolerance by dominant individuals or rewarding of sentinels. These results are discussed in light of experimental constraints and the wider literature.

The impact of parental loss on gorilla survival and sociality

Robin Morrison¹, Riley Derby², Victoire Martignac¹, Winnie Eckardt³, Shannon McFarlin³, Aaron Sandel², Tara Stoinski³, Stacy Rosenbaum⁴

¹University of Zurich, Switzerland

²University of Texas, United States of America

³Dian Fossey Gorilla Fund, United States of America

⁴University of Michigan, United States of America

Mothers play a crucial role in the care of immature mammals, but in some species other group members also provide vital support, impacting immature survival. Over the past 5 years we have conducted a series of studies examining the impact of early life maternal and paternal loss on the long-term survival and behaviour of mountain gorillas. Using data on 253 wild mountain gorillas from birth, we found that whilst paternal loss is associated with a five-fold increase in mortality in young gorillas, maternal loss after weaning does not impact their survival. In this talk I will discuss if and how this surprising finding may be explained by the impact of multiple parental "role models," social buffering, and behavioural changes that follow from the early-life loss of a parent. This holistic approach will highlight the mechanisms through which the detrimental effects of losing a primary caregiver in early life can be buffered and the potential for parental loss in early life to elicit adaptive behavioural responses. These findings provide valuable context for understanding the evolution of care systems and the selective forces that resulted in high rates of allomaternal care in humans.

Time in the city: long-term urban exposure predicts greater exploration and problem-solving in wild red foxes

F. Blake Morton¹, Dylan Thompson-Jones¹, Kristy A. Adaway¹, Koko M. Sutter¹, Catia Matos², Georgia B. Freer¹, Georgia A. A. Fletcher¹, Carl D. Soulsbury³

¹Department of Psychology, University of Hull, Hull, United Kingdom

²School of Environmental Sciences, University of Hull, Hull, United Kingdom

³School of Natural Sciences, University of Lincoln, Lincoln, United Kingdom

Urbanisation is one of the most important forms of human-driven landscape change, altering wildlife populations in unprecedented ways. In terms of behaviour, for example, urbanisation is hypothesised to increase the likelihood of observing urban populations touching, exploring, and solving novel food-related tasks compared to rural areas. However, little is known about the impact of spatiotemporal patterns of urbanisation, particularly historical patterns of change, on these behaviours. We tested this in the world's most urbanised carnivore, the red fox (*Vulpes vulpes*), by introducing novel food-related tasks (puzzle feeders) to 284 sites throughout Great Britain. We compared tactile and problem-solving behaviours in rural populations, recently colonised urban populations, and long-established urban populations (>40 years). Foxes from 27.4% of locations touched the tasks, foxes from 12.4% of locations solved them. Urban foxes were more likely to touch tasks compared to rural populations. Exploration time, exploratory diversity, and latency to touch tasks did not significantly differ across urban and rural locations. Urbanisation rate from 1994 to 2020 (26 years) did not significantly predict the likelihood of foxes touching or solving tasks across locations. Older urban populations – particularly from London – spent more time exploring tasks and displayed greater exploratory diversity and higher problem-solving success, despite more recent urban populations being equally likely to touch them. Collectively, our findings suggest that certain population characteristics, such as the likelihood of touching/engaging with novelty, potentially emerge early in urbanisation while other characteristics, such as greater exploratory and innovative behaviours, may emerge after long-term urban exposure across many decades.

Too hot to school: influence of elevated temperature on social behaviour in fish

Amelia Munson^{1,2}, Daphne Cortese^{1,3}, Shaun S Killen¹

¹University of Glasgow, United Kingdom

²Swedish University of Agricultural Sciences, Sweden

³Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Germany

Faced with unprecedented rates of temperature change, research on the impact of warming on behaviour is growing. However, the relative ease of studying animals in isolation means there is a lack of knowledge about how temperature influences social behaviour. For ectotherms like fish, temperature can alter metabolic needs; changes in metabolic needs can subsequently shift the costs and benefits of sociality as individuals prioritize access to food over predator protection. For fish, who spend all or part of their lives in social groups, this limitation in research focus may lead us to underestimate the impacts of warming. In this talk, I will overview a series of studies we conducted at different scales that explore the relationship between temperature, metabolism and social behaviour in fish. We will move from lab studies designed to look at the influence of short-term changes in temperature on sociality, to mesocosm studies focused on group movement in thermally complex environments, up to work conducted in semi natural ponds on the influence of individual metabolism and sociality on movement across seasons.

Social organisation of zebra finches in the wild - tracking long term family movement

Noëlle Tschirren, Lysanne Snijders, Hugo Loning, [Marc Naguib](#), Simon C. Griffith, Chris Tyson

Wageningen University

Zebra finches are a key model in behavioural research, particularly for studying vocal learning. In laboratory studies, juvenile sons primarily learn their song from their father during a sensitive developmental period. Whether this pattern holds in the wild is unclear, as family cohesion under natural conditions is poorly understood, and early juvenile independence in a complex social environment may lead to learning from multiple tutors. To better understand social organisation, vocal communication, and their influence on song learning in wild zebra finches, we fitted parents and fledglings with solar-powered radio transmitters to track their movements over time. We examine how families are socially organised, how spatial proximity between family members changes over time, and whether there are sex differences in juvenile proximity to parents. We also examine whether parents expose offspring to larger social networks at social gathering places, potentially providing access to multiple song tutors. By addressing these questions, we aim to gain new insights into the social organisation and vocal communication of zebra finches, and relate laboratory findings to the ecologically relevant environment in the wild.

Advances in studying the behaviour of a critically endangered primate in a complex agroforestry mosaic landscape in Indonesia

Anna Nekaris¹, Leslie Paige², Endah Sulistyawati³, Laura Karimloo⁴, Anggana Lugina⁵, Titan Sulistia³, Tati Suryati Syamsudin³, Katherine Hedger¹

¹Centre for Ecology, Evolution and Environment, Anglia Ruskin University, United Kingdom

²Department of Anthropology, Washington University St Louis, United States of America

³Department of Biology, Institut Teknologi Bandung, Indonesia

⁴Faculty of Forestry and Environment, Eberswalde University for Sustainable Development, Germany

⁵Little Fireface Project, Indonesia

Agroforestry systems are increasingly vital for wildlife; in the tropics, many threatened species now persist in these habitats to the exclusion of primary forests. Since 2012, we have studied the Critically Endangered Javan slow loris (*Nycticebus javanicus*) in Cipaganti, Indonesia. We present a range of methods used to understand the behaviour and persistence of this species in a dynamic landscape. We monitored 189 individuals, focusing on 21 adult pairs via VHF radio tracking, yielding over 325,000 five-minute data points. To classify habitat, we used object-based image analysis of high-resolution drone imagery (2.9 cm/px). We found that pairs maintain remarkable fidelity to home ranges despite major crop shifts. While 45–60% of home ranges consist of "natural" vegetation like bamboo, the species adapts to anthropogenic areas, with some ranges comprising 45% homesteads. Furthermore, canopy bridges allowed social groups to double their home range size. We also demonstrate that satellite imagery overestimates forest cover by up to 18.8%, highlighting the necessity of groundwork to understand habitat use. We emphasise that studying animal behaviour in such landscapes is essential for conservation.

Multiple roles of photoreception cause multiple threats to animal life on earth

Dan-Eric Nilsson

Lund University, Sweden

Popular accounts of the effects of light pollution focus on attraction of insect to light, deterrence of bats and disturbance of circadian rhythms, and often not much else. This falsely gives the impression that light pollution only affects some animals and that the impact is mild or moderate. But nothing could be more wrong. Light is involved in the control of animal life in so many ways that the effect of light pollution becomes massive and one of the major threats to global biodiversity. The lecture will take a tour through the different ways in which animals use photoreception to control behaviour and other aspects of their life. Artificial light at night (ALAN) interferes with essential mechanisms such as choice of habitat and behaviours, including effects on biological rhythms. Another way of action of ALAN is alteration of visual performance, e.g. making predators more efficient. ALAN will also interfere with mechanisms of orientation and navigation. Finally, ALAN interferes with animal maturation, growth and physiology. The consequences are major alterations of the spatio-temporal distribution of animals, propagating through ecosystems and massively reducing biodiversity.

Anemonefish prioritise mutualistic partner over social group during marine heatwave

Fletcher Noble¹, Melissa Versteeg^{1,2}, Alex Coupland¹, Anoushka Pinto¹, Eve Stephenson-Archibald¹, Laura Sullivan^{1,3}, Theresa Rueger¹

¹Newcastle University, United Kingdom

²Okinawa Institute for Science and Technology, Japan

³University of Bristol, United Kingdom

Animal behaviour is often the first line of defence to changing environments, with high behavioural plasticity predicting more positive outcomes during disturbance events. Behavioural plasticity during disturbance is especially important as it impacts social and mutualistic relationships, which may in turn influence resilience. However, how social and mutualistic behaviours change in response to environmental disturbances is unknown for most taxa. Clown anemonefish, *Amphiprion percula*, make a tractable model to understand how disturbances such as marine heatwaves alter social and mutualistic behaviours. Our study measured activity levels, mutualistic, and social behaviours in clown anemonefish during a marine heatwave in Kimbe Bay, Papua New Guinea. Since some of the hosting anemones bleached, lost their symbiotic algae, and others did not, we were able to disentangle the direct effects of heat stress from the indirect effects through degraded mutualistic partners. We found thermal stress the biggest predictor of clownfish activity levels, with continued exposure to increased temperatures causing activity to decline by up to 18%, while bleaching caused changes in social behaviours, with fish becoming more aggressive and spending less time on social interactions. Interactions with the mutualistic host were not affected by either thermal stress or bleaching. Our results provide an example of behavioural plasticity in the face of environmental change, with animals prioritising interactions with their mutualistic partners, while social cohesion may be threatened during times of disturbance.

The effects of sleep disruption and temperature on shoaling cohesion in the Trinidadian guppy (*Paracheirodon axelrodi*)

Helena Norman, Katie E. Grieve, Jan Linström, Shaun S Killen

University of Glasgow, United Kingdom

Sleep is a fundamental neurophysiological and behavioural state, observed ubiquitously across the animal kingdom. While the function of sleep remains elusive, its importance is evident through the deleterious effects of sleep deprivation. In fish- an understudied taxon in the context of sleep behaviour and ecophysiology- sleep disruption has been linked to impaired cognition, altered movement, and reduced predator avoidance responses. As ectotherms, fish are particularly vulnerable to climate change, with increased temperatures associated with a plethora of behavioural and physiological changes. However, the impact of climate-related stressors on sleep in shoaling and group behaviour is largely unexplored. The present study aimed to address this gap by investigating 1) how varying degrees of sleep disruption (one night or three nights) affected group cohesion, and 2) whether temperature modulated the effect of sleep disruption on group behaviour. Using groups of 5 Trinidadian guppies (*Poecilia reticulata*), we implemented a repeated measures experimental design with four disruption treatments- one versus three days of intermittent physical disruption in the day and the night- at two temperatures (23 and 29°C). To assess how different degrees of sleep disruption, alongside temperature differences, affected groups of guppies, we used an open field test to measure movement, shoal cohesion and polarity after each disruption treatment, and then quantified behavioural changes using video tracking software. This study represents a novel investigation into how sleep disruptions, alongside temperature change, may disrupt shoaling activity and efficiency, with potential implications for predator avoidance and energy expenditure.

Network cognition in a group-living primate: discrimination between distant third-party friendly relationships

William J O'Hearn, Rebecca Hooper, Siena Margorian, Daniel Philips, Angelina Ruiz-Lambides, James P Higham, Lauren J N Brent

University of Exeter, United Kingdom

Social relationships represent a network of pipelines through which essential resources flow. To meet their needs and navigate their environments, individuals must track not only their own relationships, but also others' relationships that form their extended social network. Humans monitor and neurally encode relationships between people they are not themselves close to, but whether other animals share this ability remains unclear. We used a violation-of-expectation experiment to ask if monkeys discriminate between friends and non-friends in distant parts of their social network. We presented free-roaming rhesus macaques with deep-faked images depicting real group members in expected (friends grooming), plausible (friends of friends grooming), and unexpected (non-friends grooming) social scenes. Monkeys in the images were neither related to, nor friends with, the subject. To ensure subjects' responses were based on monitoring interactions between others, rather than heuristics such as "sisters are often friends", or "sociable individuals groom each other", we held constant key features of our deep-faked dyads i.e., relatedness, social status, age, and gregariousness. Subjects looked longer at images of non-friends grooming than images of friends, suggesting these images violated their expectations. Responses to the friends-of-friends treatment did not differ substantially from the other two treatments. Together, our results support the interpretation that monkeys discriminate between friend versus non-friend relationships in distant parts of their social network. Network cognition may be common amongst social animals with broad implications for how humans and other animals navigate societies and influence the flow of resources, disease, and information.

Using passive acoustics to assess the effects of land-use on bird and bat species composition in the Carolinian zone

Liam O'Leary, Natalie Emerick, Hannah ter Hofstede

University of Windsor, Canada

The Carolinian zone in Southern Ontario is one of Canada's most biodiverse ecoregions, but most densely populated. To assess the potential impact of anthropogenic landscape changes on bird and bat populations, we tested the hypothesis that modified habitats affect species composition through the dependency that species have on physical characteristics within these habitats. We predicted that bird and bat community compositions would be similar in physically similar habitats, but the activity levels and diversity would be lower in modified habitats. To measure this, we deployed acoustic monitors to record vocalizations in four paired habitat types. Bird and bat vocalizations were identified and quantified in recordings to assess activity levels. While the total activity for all bird or bat species combined did not differ between habitat types, individual species showed a variety of different results with some present in both habitat types but had higher activity levels in natural, some were only present in natural, and others had similar activity levels across all types. This mix of outcomes suggests that there is no blanket solution to conserving bird or bat diversity in this area.

The frequency of birdsong and its importance in territory defence among pigeons and songbirds

Tomasz S. Osiejuk, Lia Zampa, Paweł Szymański

Department of Behavioural Ecology, Adam Mickiewicz University, Poznań, Poland

One possible way a bird song may function in territory defence is as an honest signal of an individual's strength, which is related to body size, condition, or current motivation. The frequency of the song has high potential to be indicative, since the size of the vocal apparatus among animal species is linked to body size and sound frequency: the larger the animal, the lower the sound produced. However, clear relationships between body size and vocalization frequency at the between-species level often disappear when comparing individuals within specific bird species. This aspect is very poorly studied with many contradictory findings. We experimentally tested how territorial males respond to manipulated songs with higher and lower than average frequency in two non-learning bird species (doves) with very stereotyped songs of fixed pitch, and in one Oscine species with a small repertoire characterized by shared song types of individually specific pitch. We observed species-specific reactions to low-pitched songs, Range use from avoiding potentially more dominant intruders, to a bimodal response to lower-frequency songs (either strong or weak), and a notably strong approach response. We discuss the results, considering body size and other hypotheses, aiming to explain the paradox of what song frequency signifies and why.

Social communication during a sow-piglet foraging paradigm

Joab Malanda Osotsi¹, Piero Seddaiu², Irene Camerlink²

¹University of Debrecen, Hungary

²Institute of Genetics and Animal Biotechnology of the Polish Academy of Sciences, Poland

Offspring may use various sensory modalities to learn, but this has in pigs received relatively little research attention. Our objective was to investigate social cues between sow and piglet during a foraging scenario. We hypothesized that 1) the sow and piglet make frequent visual, auditory and tactile contact, 2) that their behaviour is related, and 3) that frequent sow-piglet communication translates to health benefits for the offspring. Piglets (n = 95) of 4-weeks age were tested individually with their mother in a 3-min foraging paradigm. Two food types were available which were known to the sow but unfamiliar to the piglet. Foraging, social behaviour and vocalizations were recorded. In the test, the sow and piglet interacted frequently, but mostly through visual and auditory contact rather than physical contact. Food-related and social behaviour of the sow positively related to the piglets' behaviour. Sows who spent more time on food-related behaviour and made more vocalisations during the test had faster growing piglets, emphasising the beneficial role of maternal behaviour in piglet development.

Mirrors in the urban matrix: reflective encounters reveal context-dependent social cognition in free-range use dogs

Tuhin Subhra Pal, Sharmistha Maji, Anamitra Roy, Anindita Bhadra

Indian Institute of Science Education and Research, Kolkata, India

Urbanisation radically reorganizes the sensory landscapes and cognitive demands faced by synanthropic wildlife. Indian free-range use dogs (*Canis lupus familiaris*) are among the most ecologically successful urban-adapted mammals, are masters of urban survival, routinely encountering anthropogenic reflective stimuli such as glass facades and pavement covered in rainwater in their natural habitat. Yet how they cognitively assimilate self-relevant visual information remains ethologically unexplored. We exposed 100 solitary adult free-Range use dogs to either a mirror (n=50) or control (n=50), coding behaviours across standardised three-minute trials using a validated ethogram encompassing five behavioural dimensions. Dogs interacted significantly and preferentially with mirrors, demonstrating sustained engagement, graduated spatial positioning at body-length intervals, and context-dependent modulation of social and investigative behaviours, rather than simple curiosity-driven reactions. These results unveil that urban free-Range use dogs possess behavioural flexibility in processing anthropogenic optical stimuli, contributing empirical insight into how human-dominated urban landscapes reshape cognitive adaptations in carnivores.

Heatwaves do not alter exploration and aggressive behaviour during agonistic interactions among male field crickets *Gryllus bimaculatus*

Malay Pandey¹, Kaylie Anne Walsh², Anustup Bandyopadhyay², Tom Ratz^{2,3}, Cristina Tunì^{1,2}

¹Department of Life Sciences and Systems Biology, University of Turin, Turin, Italy

²Department of Biology, Ludwig Maximilian University, Munich, Germany

³Department of Evolutionary Biology and Environmental Science, University of Zurich, Zurich, Switzerland

Heatwaves are expected to become more frequent and intense due to climate change. Understanding how organisms respond to sequential days of prolonged heat is therefore crucial, particularly for ectotherms, which are highly sensitive to ambient temperature changes. While heatwaves clearly affect ectotherm physiology and metabolism, sublethal effects on behaviour remain less understood. We addressed this gap in the Mediterranean field cricket (*Gryllus bimaculatus*) by focusing on two behaviours, exploration and aggression that are linked to foraging and reproductive success, respectively. We divided males into two groups that experienced either, a 5-day heatwave (33°C) or a control (28°C) treatment, and scored their exploration behaviour (i.e., distance moved in a novel environment) and aggression against a non-focal group of males, that did not experience heat stress. We predicted higher levels of both exploration and aggression in heat stressed males. Our results did not support our hypothesis as we found no detectable differences in these behaviours. Overall, these findings suggest that these behaviours may be robust to short-term thermal stress. This resilience may reflect inherent tolerance to warm conditions in a species native to hot environments or indicate rapid recovery following exposure. Further research is needed to clarify the broader consequences of heatwaves on animal behaviour.

Sensory processing sensitivity shapes environmental perception and behaviour in horses

Mélissa Peignier¹, Jenni Kahkonen^{2,3}, Maya Bräm^{1,4}, Jade Boisbouvier^{1,5}, Brune Collaudin^{1,6}, Claudia Gaudillat^{1,7}, Michele Guastalla^{1,8}, Manon Mantello^{1,7}, Sabrina Briefer Freymond¹

¹Agroscope, Swiss National Stud, Les Longs-Prés, 1580 Avenches, Switzerland

²Department of Biological and Experimental Psychology, Queen Mary University of London, London, United Kingdom

³Department of Psychological Sciences, University of Surrey, Guildford, United Kingdom

⁴MayAnimal, 5070 Frick, Switzerland, independent researcher

⁵Toulouse school of agricultural and life sciences, 31326 Castanet-Tolosan, France

⁶Laboratory of Experimental and Comparative Ethology, University Sorbonne Paris Nord, 93430 Villetaneuse, France

⁷Institut Agro Dijon, 21079 Dijon, France

⁸Department of Environmental Systems Science, Swiss Federal Institute of Technology Zurich, 8092 Zürich, Switzerland

Sensory Processing Sensitivity (SPS) is a personality trait that shapes how individuals perceive, process, and respond to ecological and social stimuli. In humans, SPS is expressed in 15–20% of the population and has been linked to individual differences in behaviour, cognition, and health that depend strongly on environmental context. Comparable patterns have been identified in dogs, where SPS-like traits are associated with variation in likelihood of developing behavioural problems. However, the extent to which SPS occurs across non-human species, and how it relates to behavioural and physiological responses, remains poorly understood. In this project, we investigated whether a comparable SPS trait exists in horses. First, we developed a novel equine SPS (eSPS) questionnaire, which was distributed internationally via an online survey. Questionnaire data revealed consistent individual differences suggestive of an eSPS trait and showed associations between higher eSPS scores, management conditions, and the occurrence of behavioural problems. To validate these findings, we conducted standardized behavioural tests on 196 horses, assessing responses to subtle environmental stimuli, emotional reactivity, fearfulness and gregariousness tests. We further measured physiological indicators of stress and arousal, including heart rate and cortisol levels. Our results provide evidence for the existence of an eSPS trait in horses, and highlight links between sensory sensitivity, management conditions, and behavioural outcomes, thereby offering new insights into how horses perceive and interact with their environment. By identifying SPS as a stable dimension of equine personality, this study advances our understanding of individual variation in environmental perception in horses, and opens the way for future comparative research across species aimed at shedding a new light on how animals perceive, process, and respond to their environment.

“Smoking habits” of great tits? Cigarette butts in nests as a possible adaptive behaviour - preliminary results

Maria Pietrala^{1,2*}, Michał Gładalski¹, Adam Kaliński¹, Marcin Markowski¹, Joanna Skwarska¹, Jarosław Wawrzyniak¹, Agnieszka Wojciechowska¹, Jarema Wódka^{1,3}, Piotr Zieliński⁴, Jerzy Bańbura¹

¹University of Lodz, Faculty of Biology and Environmental Protection, Department of Experimental Zoology and Evolutionary Biology, Lodz, Poland

²BioMedChem Doctoral School of the University of Lodz and Lodz Institutes of the Polish Academy of Sciences, Lodz, Poland

³University of Lodz, Doctoral School of Exact and Natural Science, Lodz, Poland

⁴University of Lodz, Faculty of Biology and Environmental Protection, Department of Ecology and Vertebrate Zoology, Lodz, Poland

Urban environments expose birds to many unfamiliar materials, like human waste. Recent observations show that some great tits (*Parus major*) living in cities sometimes use cigarette butts as nesting material. Tobacco (*Nicotiana* spp.) has been widely known for its ability to repel or kill insects, making such behaviour potentially adaptive. These blood-sucking parasites, living in tits' nests, can diminish host condition and reproductive success. In our study, we evaluated whether the presence of cigarette butts in great tits nests (treatment A) or the replacement of the original nest with a sterilized artificial nest made of moss and cotton wool (treatment B) - performed three times, on days 4, 8 and 11 of the nestling period - would affect nestling condition. To assess physiological status, we measured haemoglobin concentration and haematocrit in nestlings at 13 days of age and compared both treatments with an unmanipulated control group (treatment C). The findings indicate that young birds from both experimental groups exhibited elevated haemoglobin and haematocrit values, suggesting a better physiological status compared with the controls.

Early response to wolf return: biollogger-based study of red deer behaviour in the presence of grey wolves

Anna Pilská¹, Pierre Colençon¹, Astrid Olejarz¹, Olivier Devineau², Miloš Ježek¹

¹Department of Game Management and Wildlife Biology, Faculty of Forestry and Wood Sciences, Czech University of Life Sciences, Czech Republic

²Department of Forestry and Wildlife Management, Faculty of Applied Ecology, Agricultural Sciences and Biotechnology, University of Inland Norway, Norway

The return of grey wolves (*Canis lupus*) to Central European landscapes offers an opportunity to study how predation risk affects prey behaviour. Using biollogging data from a tri-axial accelerometer and magnetometer, we examine behavioural changes in 24 free-Range use female red deer (*Cervus elaphus*) from an area inhabited by wolves (Doupov) and a control area without wolves (Slavkovský les) in the western Czech Republic. We focus on changes in the frequency and duration of vigilance, foraging, resting, and sleeping to evaluate whether the return of wolves shifts allocation in ways that could affect energy intake, recovery, and overall fitness. Behaviour was classified with a validated XGBoost multisensor model, enabling continuous individual-level behavioural time series. We investigate whether red deer initially respond to the return of wolves and if these reactions decrease over time, indicating habituation. The study highlights non-consumptive effects of predators and the value of behaviour-based biollogging in understanding prey responses in human-dominated landscapes.

Fishing for answers: behavioural drivers of capture in Amazonian fish

Mar Pineda¹, Daiani Kochhann², Adalberto Val³, Jan Lindstrom¹, Kathryn Elmer¹, Shaun Killen¹

¹University of Glasgow, United Kingdom

²State University of Vale do Acaraú, Brazil

³INPA, Brazil

Fishing is one of the most pervasive human-induced pressures on aquatic ecosystems, yet its role in driving behavioural change remains poorly understood. While growing evidence shows that harvesting can select on behavioural traits, this has been largely overlooked in small-scale and artisanal fisheries such as the ornamental fish trade. This is surprising given its global scale, high selectivity, and importance for biodiversity and local livelihoods. Here, we combine laboratory simulations and field observations in the Amazon to examine whether behaviour predicts capture vulnerability, whether gear type selects for distinct phenotypes, and whether environmental variation (e.g. temperature) modulates these relationships. Laboratory simulations revealed that capture probability is associated with a suite of traits, including exploration and risk-taking behaviour. Field comparisons showed that individuals captured using different gear types exhibit consistent behavioural differences, suggesting gear-specific selection. Underwater video observations further demonstrated that capture is a multi-stage behavioural process shaped by decision-making, with clear differences between species and sensitivity to environmental conditions. Together, these findings provide some of the first evidence that ornamental fisheries can act as selective forces on behaviour, highlighting an overlooked pathway through which human activities may drive behavioural change in wild fish populations.

Is climate change amplifying the effects of artificial light at night (ALAN) on hermit crab personality?

Eleanor Pinkney¹, Mark Briffa¹, Pete Cotton¹, Svenja Tidau²

¹University of Plymouth, United Kingdom

²Bangor University, United Kingdom

In nature, organisms are challenged by multiple stressors, but their combined and interactive effects on behaviour remain understudied. Infodisruptors such as artificial light at night (ALAN) can mask or distract from information cues and are predicted to amplify the effects of impaired performance due to elevated temperature. The European hermit crab (*Pagurus bernhardus*) is a model species for investigating the behavioural effects of anthropogenic change. This research seeks to investigate the main and interactive effects of ALAN and increased water temperature, both at the sample mean-level, and on inter- and intra-individual behavioural variation. Individuals will be exposed for 14-days to either a natural lighting regime, or nighttime light of 10 lx, and a water temperature of 15 or 17°C. Individual startle response durations will be recorded twice daily to determine the effect on risk-coping behaviour during the day and at night. The way individuals choose to balance the risk of predation with the reward of fitness-enhancing life-history activities can have important evolutionary consequences. Understanding whether the behavioural impacts of an anthropogenic pollutant (ALAN) are modulated by a climate change effect (increased water temperature) is therefore key to predicting effects on species distributions, ability to respond to environmental change, and speciation rates.

Macaque social network structure beyond rank assortativity

Diogo L Pires¹, Lauren J Brent², Sune Lehmann^{1,3}, Josefine Bohr Brask⁴

¹Center for Social Data Science (SODAS), University of Copenhagen, Denmark

²Centre for Research in Animal Behaviour, University of Exeter, United Kingdom

³DTU Compute, Technical University of Denmark

⁴Behavioural Ecology Group, Section for Ecology & Evolution, University of Copenhagen, Denmark

Social structure influences ecological dynamics, fitness, and evolution in animal populations. Network science approaches explain emergent social structure in animal societies by linking individual and relational characteristics to the formation, stability, and evolution of social relationships. This work examines how dominance rank, kinship, and demography influence social structure in macaques, focusing on connections between the highest- and lowest-ranking individuals. We analyse free-Range use groups from Cayo Santiago, PR. Their social networks are strongly assortative by dominance rank, yet systematic deviations emerge: lowest-ranking individuals frequently connect with the highest-ranking ones and are detected within their social communities. These patterns suggest latent or historical dynamics not explained by inferred effects of rank assortativity, kinship, or demographic structure. We hypothesise that such ties reflect strategic behaviour by low-ranking individuals seeking associations with high-ranking individuals without directly challenging the dominance hierarchy, potentially contributing to the long-term success of low-ranking matriline.

Domestic dog disturbance of Ethiopian wolves in a protected Afroalpine habitat

Beth Preston¹, Naomi Hawrylak², Alo Hussein³, Eric Bedin³, Jorgelina Marino²

¹Royal Veterinary College, University of London, United Kingdom

²University of Oxford, United Kingdom

³Ethiopian Wolf Conservation Programme, Ethiopia

Domestic dogs (*Canis familiaris*) are ubiquitous across the globe, yet very little is understood about the disturbance they cause to wild animals. Even less is known about the disturbance caused by free-roaming domestic dogs, who may be permitted to interact with wild species in protected areas. This study seeks to understand more about these interactions in the Bale Mountains National Park, Ethiopia, home to the world's most endangered canid, the Ethiopian wolf (*Canis simensis*). Using a long-term dataset of wildlife sightings over more than 30 years, this study investigates the frequency of wolf-dog encounters, the behaviour of wolves and dogs, and who instigates the encounters. Frequency of wolf-dog encounters was dependent on time of day, with encounters most likely to occur between 12:00 and 13:00, during the peak foraging hours of the wolves. Aggressive encounters were more common than expected, accounting for 60% of all recorded encounters, with both wolves and dogs responsible for instigating these behaviours. When one species was numerically superior over the other, that species was likely to behave more aggressively or instigate the aggressive encounter. This study finds substantial evidence for disturbance and harassment caused by domestic dogs and offers recommendations for management of domestic dog populations in this protected area, particularly during prime foraging hours.

The nocturnal effect of human presence on the biological time of captive badgers

Mónica Judá Ramires^{1,2}, Hugo Almeida da Costa Oliveira³

¹University of Minho, Portugal

²Biological Park of Vila Nova de Gaia, Portugal

³Environment and Climate Change Control Division, Municipality of Vila Nova de Gaia, Portugal

Understanding and improving the welfare of captive animals requires evaluating how unavoidable human presence shapes behaviour over time. This presentation integrates technological and analytical advances to address this challenge in wild species under human care. Using a captive pair of European badgers (*Meles meles*) as a focal system, continuous nocturnal ethograms derived from camera recordings (18:00–07:00) are analysed in relation to visitors, husbandry routines, enrichment, and environmental context. Behaviour is assessed at biologically meaningful temporal scales rather than hourly intervals, reducing analytical artefacts and revealing coherent organisation of biological time. Instead of relying solely on mean activity or stress levels, analyses incorporate rhythm structure, behavioural stability, and diversity, enabling detection of subtle welfare-relevant changes within real-world management constraints. Results indicate that night-time human presence and absence of enrichment alter stress patterns and circadian organisation, while higher daytime visitor levels are associated with increased nocturnal sett use. These findings demonstrate the value of temporally aligned frameworks for detecting welfare impacts in nocturnal species.

Talking to team up: communicative precision in wolf vs. dog cooperation

Friederike Range¹, Sarah Verrart¹, Flavie Stefani¹, Sandro Sehner¹, Gwendolyn Wirobski², Klaus Zuberbühler²

¹University of Veterinary Medicine Vienna, Austria

²Université de Neuchâtel, Switzerland

Human language may have arisen at the intersection of two evolutionary trends: enhanced cognition (shared with great apes) and enhanced cooperation (evolved independently), especially in cooperative breeding. In such systems, the assistance of kin and sometimes non-kin conspecifics is crucial for offspring survival requiring considerable action coordination, not only between the caregivers but also with the offspring, and communication is likely to play a key role. Yet communication's role in cooperation remains understudied. We here test the cooperation–communication hypothesis by comparing two closely related canids that differ in intraspecific cooperation: wolves and dogs. Wolves routinely cooperate in territorial defence, hunting, and pup rearing; free-Range use dogs, adapted to human-dominated niches, typically rear pups with little help and rarely hunt cooperatively. We reanalysed a large dataset of cooperative string-pulling tasks to assess how communicative signalling supports coordination. We found that wolves deploy more precise, task-relevant signals that facilitate joint action, whereas dogs showed reduced communicative scaffolding and lower cooperative success.

Crocodilian cognition - utilising the last ectothermic archosaurs to understand the origins of the avian mind

Stephan A. Reber, Mathias Osvath
Cognitive Science, Lund University, Sweden

Crocodylians are the closest living relatives of birds and the last ectothermic archosaurs. They have an avian-like neuroanatomy including a very small nidopallium caudolaterale (NCL), the seat of behavioural control in birds. Its relative size appears related to the levels of cognitive complexity (largest in corvids). Hence, crocodylians are an ideal model for the evolution of avian cognition. Capacities shared with birds were most probably already present in the common ancestor. Cognitive skills which scale in complexity with the NCL, were probably selecting for its size increase. We have conducted detailed comparative experiments with American alligators and a host of bird species. We found that alligators parallel almost all birds in many aspects of fundamental cognition, including object permanence, object individuation, and working memory. They are worse at simple motor-self regulation. However, they can inhibit immediate responses if engaging working memory. Overall, they appear to spend more mental effort than birds to solve a task - probably due to their lower number of neurons - suggesting that the advent of endothermy primarily increased the efficiency of brains.

Submission signalling in a cooperatively breeding cichlid fish

Adam Reddon, Tommaso Ruberto, William Swaney
Liverpool John Moores University, United Kingdom

Aggression is costly, and animals have evolved tactics to mitigate these costs. Submission signals are an underappreciated example of such adaptations, particularly important for highly social animals. Here we discuss a set of recent studies examining the causes and consequences of submission signalling in the cooperatively breeding cichlid fish, *Neolamprologus pulcher*. We show that submission signals produced by subordinates increase the degree to which they are tolerated by the dominant breeders, allowing for greater territorial access and less aggression being received. We also show that the expression of submission in *N. pulcher* subordinates depends on the spatial and social context of their interaction with dominant breeders. We found that submissive behaviour is positively correlated with affiliative behaviour, suggesting that submission is indicative of a general motivation to increase social tolerance. Finally, we show that the expression of oxytocin in the preoptic area of *N. pulcher* brains is negatively related to submissiveness. This work illuminates submission signalling in a highly social vertebrate and emphasises submission as an understudied aspect of communication.

Human disturbance in a butterfly house: a Bayesian approach

Samuel Richardson¹, Jackie Chappell¹, Susannah Thorpe¹, Rebecca Biddle²

¹University of Birmingham, United Kingdom

²Twycross Zoo, United Kingdom

Walk-through butterfly houses provide immersive visitor experiences but require continual restocking due to butterflies' short adult lifespans. While environmental management for butterfly health is well studied, the behavioural effects of visitors on butterflies remain poorly understood. We analysed 4,400 scan samples from 400 transects across 11 areas in Twycross Zoo's butterfly house, modelling counts of four species: Blue Morpho (*Morpho peleides*), Giant Owl (*Caligo telamonius memnon*), King Swallowtail (*Papilio thoas*), and The Flame (*Dryas iulia*). Three Bayesian negative binomial models tested how human presence influenced butterfly abundance, area use, and behaviour while controlling for environmental factors, bird presence, time of day, and species interactions. Butterfly counts declined with each additional human for most species (9% to 11%), but only slightly for Giant Owl (2.8%). Public area use decreased (11% to 26%) while use of vegetated areas increased (9% to 20%). Active behaviours such as flying and territorial chasing declined (11% to 23%), while withdrawal from human touch increased notably for the Blue Morpho by 15% (95% CI: 6% to 24%). These findings demonstrate species-specific responses to visitor presence within an enclosed exhibit. Additionally, environmental variables e.g., temperature and other biotic interactions further influenced abundance. This underscores the complex interplay of anthropogenic and ecological factors within enclosed environments.

Social effects on neophobia in red-billed chough

Sophie Ridgway, Sophie Nash, Alex Thornton, Rachael Miller
Centre for Ecology and Conservation, University of Exeter, United Kingdom

Globally, 28% of animal species are at threat of extinction, largely due to increasing anthropogenic pressures. Reintroductions are a vital conservation tool, but lack of understanding or consideration of individual cognitive and behavioural variation, such as neophobia (aversion to novelty), can impact their success, including post-release survival. We used repeated tests to quantify responses to novel and familiar objects in 45 captive red-billed choughs (*Pyrrhocorax pyrrhocorax*); Britain's most threatened corvid (crow family) species, and the focus of active UK reintroductions. We tested effects of social context, and recorded social (affiliative, agonistic) and spatial behaviours before, during and after object exposure. Preliminary results provide important evidence that choughs alter their social behaviour when exposed to novelty, showing increased physical contact between groups when novel objects are present compared to control conditions. Changes in spatial distribution further suggest increased group cohesion as an initial response to a potential threat. These findings highlight the importance of social context for reintroduction strategies and constitute a first step towards integrating cognitive and behavioural assessments into conservation.

Capitalizing on novelty: how wolves and dogs interact with human-created objects

Daniel Rivas-Blanco, Lou Gonnet, Femke van Stehen, Sabine Tebbich, Sarah Marshall-Pescini, Friederike Range
University of Veterinary Medicine Vienna

Human-created objects are a source of novel challenges and opportunities in animal environments. The way animals interact with these objects is shaped by both evolution and ontogeny. Wolves are often afraid of novel objects, likely due to being extensively hunted by humans in the past, thus selecting for those wariest towards novelty. Dogs in their evolutionary environment were scavengers living off human refuse, and therefore had an incentive to interact with novel objects. Moreover, dogs living as pets are encouraged to interact with novel objects, in the form of toys. We discuss two studies done on similarly raised captive wolves and dogs, as well as pet dogs. In the first study, we presented them with two novel objects. After a week of exposure with the first object, we added the second one to compare their reaction to both. In the second study, we gave the animals novel puzzle boxes with different opening mechanisms baited with food. Dogs were not more driven to interact with the objects in either study, but pet dogs were more successful at solving the puzzle boxes. The implications of these studies, and the way in which they differ from one another will be discussed.

Sex-based dietary niche partitioning in island endemic birds of São Tomé and Príncipe

Lynn Robey^{1,2}, Vanessa A. Mata^{1,2}, Ana V. Leitão^{1,2}, Raquel Ponti^{1,2,3}

¹CIBIO-InBio, Centro de Investigação em Biodiversidade e Recursos Genéticos, Laboratório Associado, University of Porto, Campus Agrário de Vairão, Portugal

²BIOPOLIS Program in Genomics, Biodiversity and Land Planning, CIBIO, Campus de Vairão, Portugal

³Area of Biodiversity and Conservation, Department of Biology and Geology, Physics and Inorganic Chemistry, Universidad Rey Juan Carlos-ESCET, Calle Tulipán s/n., 28933 Móstoles, Madrid, Spain

Tropical islands are excellent environments in which to study evolution due to their relative isolation and unique, simplified ecosystems. These conditions limit colonisation and lead to reduced species richness compared with mainland systems, which in turn decreases interspecific competition and can leave more ecological niches underexploited. At the same time, reduced community diversity often results in higher population densities, increasing intraspecific competition and potentially intensifying niche partitioning within species' resource use and diet. Although island species may have more generalist diets at the species level, individuals can become more specialised, thereby reducing intraspecific competition. This pattern is expected to translate to greater differentiation in diet between sexes, yet to our knowledge, no studies have assessed intra-specific variation in diet of island birds. In this study, we compared the diets of males and females from several bird species endemic to the islands of São Tomé and Príncipe, which exhibit varying levels of morphological dimorphism. We combined DNA metabarcoding of faecal samples, molecular sex determination, morphometric data and generalised linear models to characterise and analyse the diets of 360 samples belonging to 14 different species. We then compared diet composition and specialization between males and females of each species to determine the extent of resource partitioning. We hypothesised that, regardless of the degree of sexual dimorphism, differences in diet between sexes would reflect behavioural or ecological divergence, potentially indicating cryptic niche differentiation in insular species as a strategy to reduce intraspecific competition.

What drives the evolution of socially transferred materials?

Elva Robinson¹, Katherine Bruce¹, Steven Ramm², Jennifer Perry³, Adria LeBoeuf⁴

¹University of York, United Kingdom

²Universite de Rennes, France

³St Francis Xavier University, Canada

⁴University of Cambridge, United Kingdom

Socially transferred materials (STMs) that pass between conspecifics encompass components such as milk, seminal fluid, skin secretions and regurgitated materials that have been metabolized by the donor and induce direct physiological responses in the receiver. We draw on inclusive fitness theory, signalling theory, and information theory to derive a series of testable predictions about the origin, properties, and evolutionary fate of STMs. STMs occupy a unique position in biological communication systems by simultaneously transferring resources and information while avoiding the costs of eavesdropping and signal competition. Nevertheless, private channels bring their own costs, increasing the risk of pathogen transmission and physiological manipulation by conspecifics. We illustrate these costs and benefits using trophallaxis in ants as a model system, showing how investigating the STMs transferred through a system of cooperating wood ant nests sheds new light into what shapes the structure and dynamics of extended cooperation networks. Despite the taxonomically widespread occurrence of STMs, the variable reliance of different animal lineages on specific STM channels likely reflects the interplay of ecological context, mating systems, and life history strategies.

Singing back: how island territoriality shapes female song in *Fringilla*

Carolina Coutinho Oliveira da Rocha^{1,2,3}, Ana V. Leitão^{1,2}

¹CIBIO-InBio, Centro de Investigação em Biodiversidade e Recursos Genéticos, Laboratório Associado, University of Porto, Campus Agrário de Vairão, Portugal

²BIOPOLIS Program in Genomics, Biodiversity and Land Planning, CIBIO, Campus de Vairão, Portugal

³Faculdade de Ciências, University of Porto, Porto, Portugal

Female bird song is now recognised as a widespread and ancestral trait, yet its evolutionary drivers and functional significance remain poorly understood. Comparing males and females across systems with different social and ecological conditions offers a powerful approach to address this gap. In particular, variation in territorial behaviour, both within and between sexes, provides an opportunity to test hypotheses about the evolution and function of female song. Oceanic islands provide ideal natural laboratories for such comparisons. Isolation and milder climate drive divergence between island species and their mainland ancestors, while reduced predation pressure allows population growth which, combined with limited area and resources, can increase competition and territorial behaviour. We investigated how island-driven territoriality influences the presence and function of female song within the *Fringilla* species complex. Using song playbacks and 3D-printed models, we measured territorial and acoustic responses to simulated territorial intrusions in the mainland *F. coelebs*, where female is absent, and two insular species, *F. canariensis* and *F. teydea*, where female song has re-emerged. We predict that, on islands, both sexes will exhibit stronger and more aggressive territorial responses and female song will be more frequent and complex compared to the mainland. We also predict that insular males and females on islands will show greater similarity in behavioural roles due to an increased need for cooperative territorial defence. This work aims to clarify the ecological and social conditions that favour the maintenance of female song, contributing to a broader understanding of how social competition shapes the evolution of communication systems.

Molecular mechanisms of sensory compensation to environmental change

Cristina Romero-Diaz¹, Teresa Nguyen², Alexander M. Farn², Piyumika S. Suriyampola², Emilia P. Martins²

¹Department of Evolutionary Ecology, National Museum of Natural Sciences (MNCN-CSIC), Madrid, Spain

²School of Life Sciences, Arizona State University, Tempe, AZ, United States of America

Altered sensory environments can reduce the reliability of information in specific sensory channels, and animals may compensate by enhancing performance in alternative modalities. We studied the molecular basis of this compensation by characterizing transcriptomic responses of zebrafish (*Danio rerio*) exposed to environmental conditions predicted under anthropogenic climate change. We maintained adult zebrafish for six weeks under low pH, high temperature, heavy and intermittent flow, dark conditions, a combined extreme-climate condition, or a control. We then dissected peripheral sensory organs (olfactory rosette, eyes, lateral line) and their corresponding brain areas (olfactory bulb, optic tectum, telencephalon) for RNAseq, differential expression and functional over-representation analyses. We found significant transcriptomic shifts in all three sensory systems (vision, chemosensation, and mechanoreception) and evidence for compensation between visual and chemosensory pathways in darkness. These results show that climate associated stressors can reconfigure sensory gene networks, and build a foundation for understanding the mechanisms underlying how animals perceive information and cope in a changing world.

Comparative anatomy of the larynx in bats, rodents and ungulates

Maria Rose-Møller¹, Thomas O'Mahoney¹, Emma Pomeroy², Jacob C. Dunn¹

¹Anglia Ruskin University, United Kingdom

²University of Cambridge, United Kingdom

Sound production in mammals is mainly generated by tissue vibrations in the larynx. While the gross morphology of the main cartilages (cricoid, thyroid, arytenoid) and hyoid bone are largely homologous across taxa variations in relative size and shape are common, and are thought to be, at least in part, related to selection pressures on vocal communication.

The principle of negative acoustic allometry outlines the fundamental assumption that larger animals have bigger larynges and vocal tracts and produce sounds with lower fundamental frequency (pitch) and formants (resonance properties) than smaller animals.

However, the initial assumption that acoustic parameters strongly correlate with body size have been challenged by a range of studies showing some species to have evolved adaptive differences in the relative size of their larynx and/or vocal tract with important implications for their vocal communication.

My PhD project examines how the larynx morphology varies across species in bats, rodents and ungulates. 3D models of the main cartilages and hyoid bone are reconstructed from CT scans obtained from the database Morphosource.org, museum collections and zoos. The shape and relative size of the larynx in relation to body length will be analysed using geometric morphometrics and compared across species using phylogenetic comparative methods.

The most recent results from this project show that bats generally show a positive larynx allometry, whereby larynx height scales positively with body length ($R^2=0.354$, $p<0.0001$). However, multiple morphological variations have been observed for the three main cartilages and hyoid bone. Further analysis will investigate any additional correlations between larynx measurements and body size in bats and significance of the morphology variations related to sound production (e.g. use and type of echolocation, habitat and sexual selection).

Does colour matter? Multi-stage predator responses to aposematic prey across urban and rural landscapes

Timo Roskam, Stan Meijers, Emily Burdfield-Steel
Universiteit van Amsterdam, The Netherlands

Predation drives diverse antipredator strategies, including aposematism: warning signals advertising chemical defences. Birds are well-established model predators in aposematism research, yet most work is based on captive foraging experiments. As a result, we know relatively little about foraging and parental provisioning of aposematic prey in wild birds, or how insect-prey scarcity in urban versus rural environments affects the avoidance of aposematic prey. We investigate how colouration and urbanisation shape foraging in blue (*Cyanistes caeruleus*) and great (*Parus major*) tits across two stages: prey capture and provisioning. Palatable and unpalatable wild-type and pale morphs of the seed bug *Lygaeus simulans* were presented at feeding platforms near nest boxes in urban and rural sites; attack behaviour and prey delivery to chicks were monitored via video. We predict (1) higher attack rates with shorter latencies for pale morphs, (2) disproportionately frequent provisioning of pale morphs, and (3) weaker morph discrimination in urban than in rural birds. This study will offer novel insights into how predator cognition and urbanisation jointly shape the evolution of aposematism.

Fisheries-like selection causes evolutionary changes in the brain and cognitive abilities in a zebrafish harvest-selection model

Tamal Roy^{1,2}, Valentin Lecheval¹, Jonas Häusler³, Pavel Němec⁴, Pawel Romanczuk¹, Robert Arlinghaus^{1,2}

¹Humboldt Universität zu Berlin, Germany

²Leibniz Institute of Freshwater Ecology and Inland Fisheries Berlin, Germany

³Freie Universität Berlin, Germany

⁴Charles University in Prague, Czech Republic

In fish populations, natural predation is attributed to fish and bird predators while human-induced predation is exerted through fishing gears that are used in commercial and recreational fisheries. Most fishing gears harvest large-sized individuals, and increased mortality of larger fish fosters the evolution of fast life-history leading to elevated energy investment into reproduction. This may be traded-off with lowered energy investment into other energy-expensive tissues like the brain thereby leading to altered brain size, neuronal numbers and cognitive abilities. We tested this using 3 experimental-evolution generated selection lines of zebrafish adapted to large, random and small size-selective harvesting over 5 generations. Small-harvested (large line) fish evolved larger brains, and heavier telencephalon with more neurons. Next, we tested hook-avoidance learning and memory by repeatedly subjecting fish groups among the 3 selection lines to fishing using baited hooks. Large-harvested (small line) zebrafish were less vulnerable to hooking and had stronger memory of hook-avoidance response while large line zebrafish demonstrated significant cognitive ability by learning to recognize a real hook. These results are highly relevant for fisheries management as changed cognitive potential is likely to have impacts on fish population sustenance.

Maternally determined egg differences shape embryonic responsiveness to environmental cues and survival in gull siblings

Francisco Ruiz-Raya¹, Alberto Velando²

¹School of Biodiversity, One Health and Veterinary Medicine, University of Glasgow, Glasgow G12 8QQ, United Kingdom

²Centro de Investigación Mariña, Universidade de Vigo, Grupo de Ecoloxía Animal, Vigo 36310, Spain

Eggs are complex socially transferred materials (STMs) through which mothers transmit nutrients, hormones, and bioactive compounds that shape offspring phenotype. Yet whether embryos passively develop under maternally defined conditions or actively integrate environmental information to modify these trajectories remains unclear. This question is especially pertinent in species with hatching asynchrony, where egg composition variation contribute to predictable sibling competitive hierarchies. We tested whether embryonic responses to prenatal external cues depend on maternally transferred egg context in the yellow-legged gull (*Larus michahellis*). In a 2 × 2 factorial design, we manipulated egg type (first-laid A vs. last-laid C eggs) and prenatal sensory environment (simulating advantaged or disadvantaged developmental contexts), then cross-fostered chicks into a disadvantaged brood position. Prenatal cues influenced glucocorticoid receptor expression, stress physiology, and begging behaviour, but asymmetrically: C-egg embryos showed pronounced plasticity, while A-egg embryos were largely unresponsive. Junior-like prenatal cues increased early-life survival in C-chicks only. These results show that embryonic plasticity is gated by maternally determined egg context, and that offspring phenotype and survival emerge from the interaction between maternal allocation and state-dependent embryonic plasticity.

Using animal-tracking data to investigate human–wildlife interactions and promote sustainable coexistence

Christian Rutz

University of St Andrews, United Kingdom

In this presentation, I will explain how animal-tracking data can be used to investigate human–wildlife interactions and promote sustainable coexistence. Specifically, I will showcase the work of the COVID-19 Bio-Logging Initiative – a UN-endorsed consortium of 600 partners that amassed over 1 billion GPS location records for some 13,000 tagged animals globally, to examine whether wildlife movement behaviour changed during pandemic lockdowns. I will then briefly introduce a new collaborative initiative that will focus on tracking animals along gradients of land modification and human disturbance, to unlock innovative pathways towards human–wildlife coexistence. Reflecting briefly on my own personal journey – which took me from curiosity-driven fundamental research to highly-applied work at the science–practice–policy interface – I will attempt to spotlight some opportunities for animal behaviour researchers to contribute to addressing pressing conservation challenges in the Anthropocene.

Two-way relationship between gut microbiota and social behaviour in the Siamese fighting fish

Manuel Sapage¹, Vasana Jinatham¹, Ana Costa¹, Andreia Ramos¹, David Gonçalves^{1,2}

¹Institute of Science and Environment, University of Saint Joseph, Macao, China

²William James Center for Research, ISPA – Instituto Universitário, Lisbon, Portugal

Gut microbiota can affect host social behaviour, but this relationship remains poorly characterized in fish. The Siamese fighting fish (*Betta splendens*) is a model species to study aggression due to its intrinsic high aggressiveness. Here, two studies will be presented where the role of the gut microbiota in the social behaviour of the species was investigated. The first study explored the interaction of long-term selection for winning and short-term competition context in the gut microbiota. Results showed that microbiome composition and both alpha and beta diversity was primarily determined by long-term selection for aggression, although microbial composition and some beta diversity metrics can also be affected by the social environment. The second study explored the effects of gut microbiota on fish larvae social affiliation. Five days old germ-free and conventionalized (with “normal” gut microbiome) larvae were tested for social preference towards a conspecific in a binary-choice maze. Results of both studies will be presented to discuss the role of gut microbiota on larval and adult social behaviour of *B. splendens*.

Personality and prosocial helping behaviour in pigs

Kaleiah Schiller¹, Alvaro Lopez², Marie Bordes¹, Liza Moscovice², Jean-Loup Rault¹

¹University of Veterinary Medicine, Vienna, Austria

²Research Institute for Farm Animal Biology (FBN), Dummerstorf, Germany

The role of personality in helping behaviour in non-human animals is relatively unknown. To investigate this question, a total of N=239 pigs underwent a novel personality test (the L test) before and after being tested in a helping paradigm in which they had to open doors to free trapped conspecifics at two separate sites (VMU and FBN). Latency to contact a novel object ('lat to obj') was the most repeatable behaviour (repeatability values of $R=0.36$; tested at weeks 2, 5 and 6 at VMU, and $R=0.43$; tested at weeks 2 and 5 at FBN) and therefore assessed against the likelihood to help conspecifics. Inclusion of 'lat to obj' was a nearly significant, negative predictor ($P=0.07$) in the helping model (Help= Y or N) and inclusion of this predictor nearly improved model fit over the null ($\chi^2(50) = 3.41$, $P=0.06$). The neophobic/negative arousal response in the personality test may help to explain why certain pigs are deterred from door opening during helping trials.

Habitat selection in an Amazonian poison frog is consistent despite anthropogenic disturbance and phenotypic variability

Lia Schlippe Justicia¹, Martin Mayer^{2,3}, Bibiana Rojas¹

¹Department of Interdisciplinary Life Sciences, Konrad Lorenz Institute of Ethology, University of Veterinary Medicine Vienna, Savoyenstraße 1, 1160 Vienna, Austria

²Department of Forestry and Wildlife Management, University of Inland Norway, Anne Evenstads Vei 80, 2480 Koppang, Norway

³Department of Ecoscience, Aarhus University, Nordre Ringgade 1, 8000 Aarhus, Denmark

Understanding intraspecific variation in habitat selection by polytypic species can reveal how populations respond behaviourally to local environmental pressures. We examined differences in habitat selection across six populations of the dyeing poison frog (*Dendrobates tinctorius*), a polytypic aposematic species inhabiting both pristine and human-disturbed forests in French Guiana. In each population, we recorded and characterised frog locations and systematically scored available habitats to test three predictions: (1) morphologically distinct populations differ in habitat selection; (2) frogs in disturbed areas rely more on structural diversity and water bodies; and (3) males and females differ in their habitat use, especially in populations with greater sexual size dimorphism. Contrary to expectations, we found little variation among populations or between disturbed and undisturbed sites. Instead, frogs consistently selected for proximity to tree falls, decaying woody material, and small water pools, while avoiding areas with dense ground vegetation and low canopy cover. Males showed a stronger selection for proximity to water, whereas females were more often found near tree falls. Combined, our results suggest that in aposematic species, habitat selection might be relatively constant across populations, potentially because of reduced susceptibility to local predation risk. Our findings provide important baseline data regarding the habitat requirements of this emblematic species, which can be relevant for efficient conservation measures in a changing world.

Going tit-à-tit: what do blue tit responses to willow tit song tell us about nest-site competition?

Benjamin M. Secker, Selvino R. de Kort, Joachim G. Frommen, Sue Anne Zollinger
Department of Natural Sciences, Manchester Metropolitan University, M1 5GD, United Kingdom

The willow tit is the fastest declining resident bird species in the UK, having reduced in abundance by approximately 97% since the late 1960s. Although the primary drivers behind its decline are currently poorly understood, high rates of usurpation from their nest cavities by blue tits may be a contributory factor. To test for a competitive interaction between the species we conducted playback experiments on blue tits, with blue tit and willow tit song stimuli and two control stimuli. The first control stimulus consisted of the songs of a non-competitive sympatric species, the blackcap. For the second control stimulus we used the allopatric varied tit, which is phylogenetically equally distant from the blue tit as the willow tit. We measured the proportion of time spent within a 5m radius of the speaker and latency to response after playback of the stimuli and recorded any vocal responses. As expected, the results show that blue tits respond most strongly to blue tit song, but they also showed a significant response to willow tit playback, and little response to varied tit or blackcap. The results of our experiment provide crucial data on the behaviour of blue tits towards willow tits and should provoke further research on the implications of interspecific competition on their decline.

Thinking like an elephant: incorporating elephant behaviour into human-elephant conflict mitigation

Mihika Sen¹, Mar Cabeza¹, Tarsh Thekaekara², Océane Liehrmann³, Bibhuti Prasad Lahkar⁴, Aritra Kshetry, Lead⁵, Amir Kumar Chhetri⁴

¹University of Helsinki, Finland

²The Shola Trust, India

³Swedish University of Agricultural Sciences, Sweden

⁴Aaranyak, India

⁵Elephant Conservation, WWF-India, India

Human-wildlife conflict is an urgent global issue, with human-elephant conflict standing out as especially severe as elephants are increasingly habituating to raiding crops in community farms. Most conflict mitigation methods focus on immediate consequences of conflict rather than underlying factors related to animal behaviour or community perceptions. Previous research on captive elephants has revealed individual-level variations in specific behavioural traits, yet such variations are rarely studied in wild elephants or included in mitigation methods. My study will address this gap by focusing on individual behavioural variations among wild Asian elephants in Assam, India, in their responses to crop protection methods and engagement in crop raiding. I will also evaluate farmers' perceptions towards these behaviours. By integrating insights from both elephant and human dimensions, this project aims to develop a holistic, adaptable and individual-level approach to conflict mitigation.

The role of personality in welfare: how individual differences in personality influence welfare variations and response to environmental enrichment in captive *Sapajus apella*

Giulia Severino¹, Felipe Villa-Larenas², María José Idalsoaga Ferrer², Esteban Idalsoaga Ferrer², Miquel Llorente³

¹Centro Universitario del Sur, Universidad de Guadalajara, Mexico

²Bioparque Buinzoo, Chile

³Comparative Minds Research Group, Departament de Psicologia, Universitat de Girona, Spain

This study investigates the relationship between personality, behaviour, and welfare in captive capuchin monkeys (*Sapajus apella*) at Bioparque Buinzoo (Chile). The main goals were to assess welfare, examine association between personality traits and abnormal behaviour, and evaluate the effects of habitat enrichment on activity levels, social interactions, and abnormal behaviours. We assessed personality using an adapted Eysenck's PEN questionnaire, whereas welfare was evaluated through the Animal Welfare Assessment Grid (AWAG), complemented with behavioural observations. The results revealed strong connections between personality traits, behaviour, and welfare. Self-directed behaviours were significantly associated with the Introversion-Extraversion personality axis, while affiliative behaviours correlated with higher welfare scores. Contrary to expectations, Anxiety-related traits were negatively correlated with abnormal behaviour. Individuals with lower welfare scores were less active, supporting the notion that poor welfare impacts both physical and psychological well-being. Habitat enrichment interventions produced mixed results: while inactivity decreased significantly, there were no notable changes in abnormal or affiliative behaviours. These findings indicate that while enrichment can improve activity, its design may require greater personalization to address social and behavioural challenges effectively. This study highlights the importance of considering individual differences when planning welfare strategies. Incorporating personality assessments into environmental enrichment planning would provide a more tailored approach, better addressing the specific needs of each animal. By focusing on individual traits, welfare can be improved, and foster healthy social interactions. This study also emphasizes the value of nonhuman primates as models for understanding personality and behaviour, contributing to both welfare management and species-specific biological insights.

The occurrence and use of polarization signals in the common cuttlefish *Sepia officinalis*

Adélaïde Sibeaux, Christelle Jozet-Alves, Pierre Grancha, Justine Gerbault, Anne-Sophie Darmaillacq

The university of Caen Normandie, France

Although polarized light is invisible to the human eye, it is a rich and structured channel of information used by many animals—not only for navigation and orientation, but increasingly recognized as a medium for visual communication. However, the information conveyed by polarisation signals in any species is poorly understood. Among marine animals, cuttlefish are likely to possess the most acute resolution to discriminate angular differences in polarised light. Not only do they excel at extracting polarised information but they also possess high reflectance iridophores stripes on their arms that reflect polarised light. Yet, their functional significance remains uncertain. To assess the use of polarized signals in cuttlefish, we developed a series of experimental tests where the light and environmental parameters were tightly controlled. Tests included social interaction with a conspecific of the same or the opposite sex, predation in the presence or absence of a conspecific and a predatory threat using a looming stimulus. Preliminary results indicate that polarization signals are widely use in social interaction and predation and shows sex-dependent use of these signals.

Can we read elephants? Recognising elephant postural signals of aggression and evasion in human-elephant interactions

Tapinder Sidhu¹, Lucy Bates¹, Michelle Henley¹, Catherine Hobaiter², Joyce Poole¹, Leanne Proops¹, Jemima Scrase¹, Rachel Thomson¹

¹University of Portsmouth, United Kingdom

²University of St Andrews, United Kingdom

Human–elephant conflict (HEC) poses a significant and escalating challenge to human livelihoods and elephant conservation, driven by increasing overlap and contact between people and elephants. Researchers have focused on physical-barrier HEC mitigation strategies – far less is known about behaviour when people and elephants meet. We investigated whether elephants display reliable postural expressions of aggression towards and retreat from humans, and tested whether people can recognise them. We present results of a component-based analysis of postures within an extensive library of African elephant video. We then conducted an online experiment, testing whether humans can discriminate between elephants displaying aggressive, fearful, or neutral behaviour towards humans. Our multi-disciplinary approach integrates both elephant signals and human understanding, furthering our knowledge of human-elephant interaction. Our findings will inform on-the-ground resources for holistic solutions in mitigating HEC and promoting safer coexistence between people and elephants.

Courtship or confrontation? The dual impact of male USVs on female vole behaviour

Daria Siewierska, Joanna Kapusta
Jagiellonian University, Poland

Ultrasonic vocalisations (USVs) are important components of rodent social communication, yet their function remains unclear. In voles, males emit USVs during sexual interactions, potentially influencing female behaviour and physiology. As induced ovulators, female voles require male-derived stimuli to enter behavioural estrus, suggesting that male USVs may act as modulatory signals. We examined behavioural responses of female bank voles (*Clethrionomys glareolus*) and common voles (*Microtus arvalis*) to pre-recorded male USVs in two experimental contexts. In the first experiment, females were briefly exposed to USVs and then introduced to a male shortly afterward. In both species, this resulted in increased aggression, including more frequent attacks and faster initiation of conflict. In contrast, when a longer delay separated USV exposure from male encounter, females displayed greater receptivity, including more lordosis positions and shorter latency to copulation. These results indicate that male USVs can modulate female behaviour, with outcomes strongly dependent on the timing of exposure.

Elevated testosterone increases impulsivity in a social bird

Miguel Silva^{1,2,3}, Ana Leitão^{2,3}, Sandra Trigo^{1,2,3}

¹Faculty of Sciences, University of Porto, Portugal

²CIBIO Research Center in Biodiversity and Genetic Resources, Portugal

³BIOPOLIS Program in Genomics, Biodiversity and Land Planning, Portugal

Impulsivity is a key component in decision-making and plays a role in defining individual fitness. While better described in mammals, the relation between impulsivity and testosterone remains unknown in birds. Therefore, we experimentally manipulated testosterone levels in a bird model, hypothesizing that elevated testosterone increases impulsive behaviour. Using 24 common waxbills (*Estrilda astrild*), we conducted a detour-reaching task, in which individuals must successfully detour around a transparent barrier. Each bird received either a control or testosterone treatment, with birds tested under both treatments in a balanced order. The testosterone treatment significantly reduced detour success, indicating decreased inhibitory control under elevated testosterone. Females outperformed males, with both showing increased performance in the second test and earlier in the day. Our findings show that testosterone is involved in inhibitory control, increasing impulsivity in common waxbills, in a sex- and context-dependent manner. These results extend evidence from mammals to birds and suggest that testosterone may play a role in modulating decision-making processes in vertebrates.

Social influences on feeding behaviour: evidence for eating facilitation in *Macaca fascicularis*

Rossella Sini, Giulia Sassi, Matilde Reni, Luca Bonini, Monica Maranesi,
Department of Medicine and Surgery, University of Parma, Italy

Social context can deeply modulate feeding behaviour in primates. We investigated eating facilitation—the increase in food intake when a conspecific is eating—in *Macaca fascicularis*, and tested whether its strength depends on dyadic social relationships. Four group-housed females were observed in sessions where an Observer (OBS) first ate in the presence of non-eating Demonstrators (DEMs), followed by a phase in which DEMs received food while OBS still had access to the same food. We quantified an Eating Facilitation Index (EFI) and assessed social bonds through a Composite Social Index (CSI) based on affiliative behaviours. OBSs showed a significant increase in food intake when DEMs began eating, demonstrating a clear facilitation effect. EFI also showed a positive association with CSI, suggesting that stronger affiliative bonds may enhance the response. These findings suggest that eating facilitation may reflect not only increased motivation but also the recruitment of shared action representations triggered by observing conspecific behaviour. Given the central role of the cingulate cortex in integrating motivational, motor, and social information, these results provide a principled framework for our ongoing neural recordings, aimed at identifying how social context shapes the transformation from observed actions to internally generated feeding behaviour.

Short-range dialect formation in an invasive wild parrot

Nick Dam, Judith Varkevisser, Michelle Spierings
Leiden University, The Netherlands

Urbanization can shape animal communication in unexpected ways. Rose-ringed parakeets (*Psittacula krameri*), introduced to the Netherlands in the 1960s, are now established mainly in urban areas, with limited presence in the rural areas between cities. This fragmented distribution provides a natural setting to examine fine-scale dialect formation. We recorded vocalisations from populations in five major Dutch cities and analysed both the vocal repertoires and the structural patterns of call elements in the rose-ringed parakeet vocalisations. Our results reveal clear, city-specific dialects, expressed not only in the types of calls produced but also in their combinatorial patterns, using a novel application of linguistic methodology to bioacoustics. Notably, these differences arise across relatively short geographic distances (approximately 30 km), similar to local Dutch dialects, highlighting how even modest spatial separation can facilitate vocal divergence. These findings demonstrate that dialect formation is not restricted to large-scale, cross-regional processes, but can emerge at a local scale when populations are structured by urban–rural discontinuities.

Conceptualising subtypes of animal flexibility and why they matter

Amelia St John Wallis, Michael T. Mendl, Benjamin Lecorps, Suzanne D.E. Held
University of Bristol, United Kingdom

Animal flexibility remains difficult to conceptualise despite its importance across fields, from animal welfare to ecology and conservation. This review aims to develop a framework for approaching flexibility in animals based on concepts from human psychology, in which flexibility can be divided into the subtypes of reactive flexibility (RF; the externally driven ability to adapt behaviour in response to change) and spontaneous flexibility (SF; the internally driven ability to generate diverse actions and responses). Consistent with findings in children, animal studies comparing performance across the tasks and metrics predicted to assess these subtypes provide initial evidence for their existence and separability. As such, the hierarchically organised framework of animal flexibility presented here includes two subtypes labelled RF-like abilities and SF-like abilities, with the latter relating to the behavioural outcome of innovation. Other key abilities (e.g., inhibitory control) and individual differences (e.g., persistence, coping styles) are highlighted that may influence these flexibility subtypes or, at least, performance on the tasks designed to measure them. Ultimately, the ways in which this framework can be applied to inform task design and generate testable predictions are discussed, using the field of animal welfare as an example.

Maternal phenotype mediates adaptive changes in offspring behaviour under social competition

Samuel J. Morris, Manuela Ferrari, Sarah Bell, Amanda J. Davidson, Jane L. Hurst, Paula Stockley
University of Liverpool

Maternal effects can adaptively shape offspring phenotypes in variable environments, but how maternal phenotype interacts with environmental conditions to mediate these effects remains unclear. Here we test how contrasting maternal phenotypes interact with the social environment to influence offspring behaviour. In our experiment, female house mice (*Mus musculus domesticus*) identified as consistently high or low in competitive aggression bred under naturalistic conditions in the presence or absence of social competition. We found that maternal phenotype and the social environment interacted to shape offspring aggression, such that environmentally driven effects were undetectable without accounting for maternal phenotype. Specifically, daughters of low-aggression mothers exposed to social competition were more likely to be aggressive. By contrast, all daughters reared in competitive environments showed reduced submission, regardless of maternal phenotype. These findings reveal phenotype-dependent variation in environmentally driven maternal effects and demonstrate how maternal phenotype modulates adaptive behavioural responses across generations.

Loudness and landscape: habitat-dependent variation in avian song amplitudes

Jolyne Surette, Hannah ter Hofstede
University of Windsor, Canada

The Acoustic Adaptation Hypothesis proposes that acoustic signals evolve to optimize transmission within specific habitats. Although widely tested in birds, most research has focused on spectral and temporal song traits, leaving amplitude—a key determinant of communication range and detectability—comparatively understudied. My research will examine how habitat structure influences songbird signal amplitudes across forest and tallgrass prairie habitats in Southern Ontario, Canada. I test the hypothesis that forest-dwelling individuals produce higher amplitude songs compared to prairie-dwelling individuals, as closed habitats impose greater transmission constraints that may favour increased signal output. To examine this, I will quantify absolute song amplitude across 10–20 focal songbird species during peak breeding season using an acoustic camera, a device that measures sound pressure levels and visualizes them as spatial heat maps overlaid on video footage. This research expands tests of the Acoustic Adaptation Hypothesis beyond traditional traits and provides one of the first comparative evaluations of song amplitude across contrasting environments.

Thermal sensitivity of survival, but not reproduction, depends on adult age in male *Drosophila melanogaster*

India Sutherland, Stuart Wigby, Liam Dougherty
University of Liverpool, United Kingdom

High temperatures can impair animal fertility, having consequences for population persistence under climate change. In insects, the sensitivity of fertility to heat stress can vary between different life stages. Survival under heat stress is known to be high in newly eclosed adult insects, possibly as a carry-over effect from selection on high thermal tolerance in pupae. However, we do not know whether this extends to the thermal sensitivity of reproduction. To investigate this, we exposed adult male *Drosophila melanogaster* flies of three different age groups (1–6 hours, 1 day, or 7 days old) to short-term heat stress (25, 36, 36.5 or 37°C for 4 hours). We then measured the survival, fertility and mating behaviour of these males. Consistent with previous studies, we found that newly eclosed adult males were more tolerant to heat stress. However, all age groups showed high levels of fertility and no changes in mating behaviour across all temperatures. Together, these results support current evidence that thermal tolerance is heightened in newly eclosed adult insects, however this does not extend to effects on reproductive traits.

Turn to the dark side: light avoidance in zebrafish varies with age and social context

William T. Swaney, Jenna Williams-Hill, Rebecca Pilkington, Sophie J. Hooley, Adam R. Reddon
Liverpool John Moores University, United Kingdom

As in many prey animals, behaviour in zebrafish (*Danio rerio*) is shaped by predation risk. Zebrafish prefer habitats that offer greater protection, such as more structured or darker environments. Zebrafish also exhibit robust shoaling tendencies and preferences for shoals that potentially offer greater protection for individuals. We measured the development of environmental preferences for dark environments in larval zebrafish, and then investigated how adult zebrafish integrate environmental and social preferences into their decision-making. In laboratory light-dark choice tests, larval zebrafish showed strong preferences for brightly lit areas before switching at around 40 days of age and preferring the dark thereafter. We confirmed this dark preference persists in adult zebrafish, and then showed that they integrate it with social preferences when making shoaling decisions. When choosing between equivalently sized shoals in dark and light areas of a test tank, adults preferred the dark shoal. However, this preference diminished when the light shoal was larger than the dark shoal, showing that zebrafish weigh both social information and environmental cues in shoaling decisions.

Beyond borrowed methods: how can we improve the study of lizard cognition?

Birgit Szabo

Ghent University, Belgium

Despite growing interest in broad phylogenetic patterns of cognitive abilities, reptiles remain comparatively understudied. As this emerging subfield of animal cognition develops, researchers face several key challenges, including a lack of standardised methodologies, limited validation of existing approaches, and often insufficient ecological knowledge of study species. Consequently, many researchers have relied on adapting established methods from other vertebrate groups, such as mammals and birds, in the absence of more suitable alternatives. In this talk, I will reflect on a decade of experience studying lizard cognition, highlighting both the limitations of applying methods derived from other taxa and the lessons learned from these challenges. I will focus in particular on methodological design and measurements, outlining common issues and some solutions to address them. Drawing on examples from my own work, as well as studies from the broader field, I will illustrate both pitfalls and emerging best practices. Ultimately, I aim to propose a more informed path forward that helps avoid underestimating the cognitive capacities of these often-overlooked animals.

First steps towards mapping the dog vocal repertoire – a behaviour test battery

Balázs Szigeti, Rita Lenkei, Paula Pérez Fraga, Csenge Reisinger, Dorottya Zaválnij, Róza Haraszti, Zsófia Bognár, Petra Szögi, Tamás Faragó
BARKS Lab, Department of Ethology, ELTE Eötvös Loránd University, Budapest, Hungary

While dogs' (*Canis familiaris*) barks and growls were studied extensively in the last decade, our knowledge about the elements and the extent of their vocal repertoire is still limited, mainly based on wolves' (*Canis lupus*) repertoire. Dogs vary greatly in behaviour and appearance as a result of domestication and later breed selection. Thus, we might also expect differences in their vocal behaviour based on phylogenetic distance from wolves, selected function and morphology. We aim to test companion dogs of different breeds and investigate potential factors affecting their vocal behaviour. After overviewing existing paradigms, we developed a two-day laboratory behaviour test battery comprising 13 subtests that represent everyday situations. These were designed to elicit different emotional and motivational states, leading to the production of various vocalisations. We also perform acoustic analyses of the recorded vocalisations and identify context-dependent acoustic differences across vocalisation types. Preliminary analyses show context- and individual-specific variability in call usage, suggesting that our test battery is indeed suitable for mapping dogs' vocal repertoire.

Challenges in posed-based behaviour recognition in chimpanzees

Flora Talyigas, Lindsay Murray, Sonya Hill, Richard Stocker
University of Chester, United Kingdom

Computer vision is increasingly enabling automated, continuous and non-invasive measurement of animal behaviour, with strong potential for applications in captive settings such as zoos and laboratories. However, reliable detection of relevant events depends on robust action recognition models, which in turn often rely on accurate pose estimation. While such approaches are well established in the human literature, pose estimation remains challenging in non-human primates such as chimpanzees, limiting their use in behavioural research. In this study, we evaluate existing chimpanzee pose estimation approaches with respect to their accuracy, robustness across environments and suitability for downstream tasks such as action recognition. Our results reveal important limitations in coverage and accuracy metrics that currently constrain the use of pose-based pipelines for higher-level behavioural inference. To address these challenges, we propose a workflow that incorporates synthetic training data to increase viewpoint and lighting diversity. By focusing on greater heterogeneity in the training data we aim to improve the model's capacity to generalise. Our approach reduces dependence on large annotated datasets, and aims to develop a transferable pipeline adaptable to other species to support automated behaviour and welfare research.

Effect of water restriction on early courtship in a monogamous songbird

Jol Tarongo¹, Joshua Davis², Jeremiah Gorman², Sophia Becker², Mary Elson², Celia McLean², Saahil Joshi², Nora Prior²

¹School of Psychology, Faculty of Medical Sciences, Newcastle University, United Kingdom

²Department of Psychology, College of Arts and Sciences, Cornell University, United States of America

This research looks into neuroendocrine trade-offs between survival and reproduction, providing insight into how environmental cues modulates avian social strategies. Zebra finches (*Taeniopygia guttata*) are opportunistic desert breeders that maintain established pair bonds during water restriction (WR) despite low circulating steroids, a phenomenon likely sustained by local neurosteroids. We investigated whether this resilience extends to the formation of new bonds by examining how WR influences courtship and physiological readiness in unpaired individuals. In an initial experiment, males and females were housed in same-sex dyads for 7 weeks under WR or control (ad lib) conditions. Across both groups and sexes, results showed a significant decline in vocalisations and circulating testosterone, suggesting a generalised reduction in breeding readiness independent of WR, potentially due to uncontrolled humidity or assay habituation. To isolate the effects of WR, a second experiment is currently underway with improved controls for aforementioned confounding variables. These studies aims to clarify the effect of WR on courtship behaviour and reproductive readiness in unpaired subjects.

Overfed and overstressed? Nutritional state affects stress coping and behavioural flexibility in rainbow trout

Xenia Gabrielidis¹, Petter Tibblin², Sabine Tebbich¹, Caroline Deimel¹, Stefan Fischer¹

¹Department for Behavioural and Cognitive Biology, University of Vienna, Austria

²Department of Biology and Environmental Science, Linneaus University, Sweden

Behavioural flexibility enables animals to adapt to changing environments. An appropriate stress response is crucial for flexibility: short-term stress can enhance cognitive function, whereas prolonged stress may impair attention and memory. The concept of allostatic load (McEwen & Wingfield, 2003) suggests that overnutrition may interfere with stress recovery and, consequently, reduce behavioural flexibility under prolonged stress. We investigated the relationship between nutritional state, behavioural flexibility, and stress responses in rainbow trouts (*Oncorhynchus mykiss*). Fish were assigned to either a reduced and or an excessive feeding regime for 1 month. We assessed behavioural flexibility using a detour task, and stress responses through cortisol measurements. We predicted that fish receiving excessive food would show lower behavioural flexibility and higher cortisol levels following an acute stressor compared with fish on a reduced feeding regime. We found that overnourished fish exhibited lower behavioural flexibility and lower plasma cortisol levels following a stressor than fish with reduced diet. This suggests that overnutrition may impair behavioural flexibility and the ability to cope with novel stressors. However, long-term cortisol concentrations in scales did not differ between the groups, possibly due to the absence of prolonged stress.

Determinants of social wound care in *Diacamma indicum*: the influence of injury site, severity, and caste on survival

Ashish Thakur, Sumana Annagiri

Department of Biological Sciences, Indian Institute of Science Education and Research Kolkata, India

Injury in social insects poses a colony-level threat through potential pathogen transmission. While *Diacamma indicum* possesses antimicrobial metapleural glands, social interventions like allogrooming and amputations are critical for their survival. We investigated if the allogrooming behaviour is modulated by individual and injury-specific parameters. Experimental data revealed that grooming and amputation significantly enhance survival, yet the treatment response is not uniform. Most notably, our results demonstrate a significant demographic disparity in recovery: callows consistently faced total mortality post-treatment, contrasting sharply with the high survival rates of the workers and gamergates. We also found that social care is highly plastic, with the frequency of allogrooming being affected by the specific leg segment injured and the extent of the injury (multiple leg injuries). These findings suggest that *Diacamma indicum* employs a context-dependent treatment strategy. By accounting for injury site, extent, and individual caste these social behaviours mitigate specific individual risks, ultimately shaping colony-level resilience and the fitness outcomes.

Vibrissal sensory discrimination training in South African fur seals (*Arctocephalus pusillus pusillus*)

Katherine Todd¹, Robyn Grant¹, Emma McCloughlin², Gary Jones³, Alyx Elder¹

¹Manchester Metropolitan University, United Kingdom

²SeaQuarium of Rhyl, United Kingdom

³Wildwood, United Kingdom

Mammals use their vibrissae (whiskers) for navigation, foraging and socialising. Pinnipeds, in particular, rely on these vibrissae in challenging underwater environments and are often referred to as vibrissae specialists. Recently, we observed that California sea lions (*Zalophus californianus*), could make task-specific vibrissae movements during a texture and size task, a level of control that had only previously been observed in humans with their fingertips. We now investigate this further in an unexplored species, the South African fur seal (*Arctocephalus pusillus pusillus*). We trained four South African fur seals to complete two vibrissae discrimination tasks (size and texture), and a visual brightness task. Two out of the four individuals successfully completed all three discrimination tasks. Challenges during training and undertaking tactile discrimination tasks occurred. Specifically, marrying complex training steps together to progress to data collection. We are now developing our tasks to look at the effect of water movements on discrimination abilities, especially to investigate whether water movements act as noise or provides useful information to the vibrissae. Using controlled zoo experiments and animal training in this way, we can start to answer questions about hydrodynamic disturbance on vibrissae sensing, which pinnipeds may experience in the wild.

Do dogs infer human attentional focus from shared experience? Evidence from mobile eye-tracking

Ana Tomašić¹, Lucrezia Lonardo¹, Zsófia Virányi¹, Christoph J. Völter^{1,2}, Andrea Sommesse^{1,3},

¹Cognition and Applied Ethology, Messerli Research Institute, University of Veterinary Medicine, Vienna, Medical University of Vienna, University of Vienna, Vienna, Austria

²Department of Comparative Cultural Psychology, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

³Center for Animal Nutrition and Animal Welfare Sciences, University of Veterinary Medicine, Vienna, Austria

Dogs' sensitivity to human attentional signals provides an excellent model for investigating pragmatics in the absence of verbal communication. In the present study, we used a mobile eye-tracking system to measure dogs' gaze behaviour, as a proxy of their referential understanding, in a referentially ambiguous situation. Dogs first engaged in a play session in which they interacted with two toys in sequence. In the both-familiar condition, an experimenter was present during both play bouts. In contrast, in the one-familiar condition, the experimenter was only present during one of these play sessions and was not introduced to the second toy. In the test, both objects were presented again and the experimenter expressed excitement towards the objects without clearly addressing one of them. We compared dogs' gaze allocation, visual search patterns, and first approach across conditions to assess whether they relied on pragmatic reasoning and exclusion processes to identify the referent of the experimenter's excitement. Similarly to a previous study with children, we predicted that, if dogs take the experimenter's prior experience into account, they would infer that the experimenter's attention was directed toward the novel object in the one-familiar condition and therefore they should preferentially look at it and approach it, while they should show no such preference when no clear referent could be inferred in the both-familiar condition. Data collection has been completed, and the results will be available at the conference.

Otters prepare for mutually exclusive outcomes: a new model for comparative cognition

Sara Torres Ortiz¹, Kasper Fjorside¹, Rocio Canales², Magnus Wahlberg¹

¹Department of Biology, University of Southern Denmark, Campusvej 55, DK-5230 Odense M, Denmark

²Veterinary Department, Mundomar, Carrer Serra Gelada, s/n, 03503 Benidorm, Alicante, Spain

Otters are a promising model to study cognition because they show a great diversity of ecological niches, social systems and degrees of manual dexterity. Here, we tested six otters from two different species in a task where they had to prepare for two mutually exclusive possibilities. Food was dropped into an apparatus where it could exit from one of two possible openings, and the most efficient strategy was therefore to cover both exits before the food was released. Otters rapidly covered both exits, in many cases within the first trials, and maintained this strategy when the apparatus allowed them to obtain the reward more reliably. This suggests that otters did not simply learn by trial and error, but that they responded to the causal structure of the task and anticipated two alternative outcomes before acting. These results are especially interesting because children under three years old, elephants, and apes usually fail in similar paradigms, suggesting that this cognitive ability might not be linked only to brain size or social complexity. Instead, it may have evolved in relation to ecological demands, such as hunting mobile prey, manipulating objects, and controlling escape routes in complex environments. Therefore, otters represent a useful comparative model to understand how cognition evolves in relation to dexterity, ecology and sociality.

Individual predictors of dogs' barking and howling behaviour

Farkas Tóth, Ákos Pogány, Tamás Faragó

BARKS Lab, Department of Ethology, Eötvös Loránd University, Budapest, Hungary

Domestication shaped canine vocal communication, but how breed-function, social and environmental context contribute to vocal behaviour remains unclear. We examined five questionnaire-derived vocalisation traits in 5,442 dogs: social and separation howling, excitement, separation and territorial/protective barking. Predictors were selected separately for each trait using elastic-net model selection and validated on unseen test data across repeated 70/30 splits. Separation barking was the most predictable trait, followed by territorial/protective barking, while social/sound-triggered howling was the least predictable. Breed function, origin, light pollution, keeping profile and owner-dog relationship were repeatedly retained across traits. Adding an owner-reported problem profile most strongly improved the prediction of separation and territorial/protective barking. These results suggest that different vocal traits are structured by distinct predictor domains, with breed-function, demographic variables, environmental context and behavioural profile contributing unequally across vocal domains.

Monkey business: exploring the stress response of Barbary macaques (*Macaca sylvanus*) to tourism in Gibraltar

Louise Tovey, Sylvain Lemoine
University of Cambridge, United Kingdom

Ecotourism can be stressful for non-human primates (NHPs) due to the presence of, and interactions with, humans. Chronic stress may lead to reproductive suppression and compromised immune function, which is particularly concerning for endangered species like the Barbary macaque (*Macaca sylvanus*). Infrared thermography (IRT) is a novel, non-invasive welfare tool used to detect decreases in nasal temperature associated with the physiological stress response. This study is the first to apply IRT to free-range use Barbary macaques. IRT and behavioural observations were conducted over one month at the Rock Nature Reserve, Gibraltar, to investigate whether (i) lower nasal temperatures are associated with stress-related behaviours (SRBs), and (ii) higher tourist densities are associated with lower nasal temperatures. Coupling IRT images with behavioural data enabled comparison between stress and non-stress-related states. Compared to resting, macaques had lower nasal temperatures when performing SRBs. Additionally, nasal temperature decreased by $\sim 0.42^{\circ}\text{C}$ for every additional 10 people within a 20m radius. These findings suggest that high-density tourism is stressful to NHPs.

Glucocorticoids shape social networks in a gregarious bird

Sandra Trigo^{1,2,3}, Beatriz C. Saldanha^{1,2}, Patrícia Beltrão^{1,2}, Marta C. Soares^{1,2,4},
Gonçalo C. Cardoso^{1,2}

¹CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado, Campus de Vairão, Universidade do Porto, 4485-661 Vairão, Portugal

²BIOPOLIS Program in Genomics, Biodiversity and Land Planning, CIBIO, Campus de Vairão, 4485-661 Vairão, Portugal

³Departamento de Biologia da Faculdade de Ciências da Universidade do Porto, Porto, Portugal

⁴MARE - Marine and Environmental Sciences Centre/ARNET - Aquatic Research Network, Institute for Research and Advanced Training (IIFA), Universidade de Évora, Évora 7002-554, Portugal

Glucocorticoid hormones are key mediators of vertebrate stress responses to social and ecological challenges, yet their effects on group-level social structure are poorly understood. Here, we supplemented the diet of a large semi-natural flock of common waxbills (*Estrilda astrild*) with either corticosterone or a glucocorticoid receptor antagonist (RU-486) and, using automated monitoring of individuals by radio-frequency identification, we quantified changes in foraging group sizes, aggressive displacements while feeding, the steepness of the dominance hierarchy, and social network structure. Neither treatment altered aggressive displacement rates or the steepness of the dominance hierarchy. Corticosterone supplementation led to smaller foraging groups, suggesting reduced gregariousness under elevated stress. Stress reduction by blocking glucocorticoid receptors strengthened social network structure (i.e., weak and strong associations became better-differentiated), indicating a clearer expression of social preferences. Thus, glucocorticoids shaped social structure without disrupting dominance hierarchies, acting primarily on how individuals associate in space and time. These results bring new insight on how glucocorticoids mediate the collective response of gregarious animals to stressful conditions.

The effect of an urban diet on spatial navigation and collective behaviour of groups of feral pigeons

Camille Troisi¹, Marina Papadopoulou², Joël White³, Luc Lens⁴, Frederick Verbruggen⁴

¹Université de Rennes, France

²Max Planck Institute for Human Development, Germany

³CRBE (UMR 5300), Université Toulouse III, France

⁴Ecobird, Gent Universiteit, Belgium

In the lab, diet has been found to greatly influence cognition through different pathways, particularly during development. Specifically, high-fat high-sugar (HFHS) diets reduce learning and memory. Yet, very little is known on the effect of diet in the context of social cognition and outside of the very controlled lab environment. In urban environments, species such as pigeons are often exposed to HFHS diets. In this study, we provided a HFHS diet and a control diet for 4 weeks to two groups of young racing pigeons, after which they all received the control diet (n=96). When individuals were trained to return to their home loft, unlike what we predicted, individuals on the HFHS diet were (1) faster at finding the home loft, (2) faster at learning, and as a flock were (3) less cohesive and coordinated than individuals in the control group. We also found effects of diet on the gut-microbiota. The gut-microbiota, through the gut-brain axis, can influence how individuals make decisions, including in groups. Diet induced gut-microbiota diversity changes could explain behavioural differences in both social and individual navigation.

Perceived support without measurable benefits - pets and well-being during COVID-19

Borbála Turcsán, Enikő Kubinyi

MTA-ELTE Lendület "Momentum" Companion Animal Research Group, Budapest, Hungary

Companion animals are widely believed to support human well-being, a perception reinforced during the COVID-19 pandemic. However, empirical findings are mixed, with some studies reporting no benefit or even negative associations between pet ownership and well-being. One explanation may be that the effects of pet ownership depend on context and may differ from owners' subjective perceptions of pet-related support. We analysed data from a three-wave longitudinal survey conducted in Hungary during 2020 (N = 5,129; 3,479; 2,883). Mental well-being, COVID-related worries, and perceived pet-related support were assessed using validated scales. Generalized linear models examined associations between pet ownership, perceived pet support, and well-being, while controlling for demographic and contextual factors. Pet ownership was not consistently associated with higher well-being. A negative association appeared only in the third wave and was explained by demographic composition. Contextual moderation effects varied across waves. Perceived pet-related support showed high internal consistency but was only weakly associated with well-being and lost significance after controlling for demographic and stress-related variables. Overall, perceived benefits of pets during crises may be psychologically meaningful without necessarily translating into measurable improvements in well-being.

Birth synchrony among kin in free-range use domestic dogs

Melissa Vanderheyden¹, Nina Truffaz², Brenda Chaignon³, Clément Car³, Małgorzata Pilot³, Giulia Cimorelli⁴, Sarah Marshall-Pescini⁵, Friederike Range⁵, Andreas Berghänel¹

¹Zoology and Animal Ecology Research Group, Department of Biology, University of Hildesheim, Hildesheim, Germany

²Department of Biology, University of Saskatchewan, Saskatoon, Canada

³Faculty of Biology, University of Gdańsk, Gdańsk, Poland

⁴Behavioural Ecology Group, Wageningen University and Research, Netherlands

⁵Domestication Lab, Department of Interdisciplinary Life Sciences, Konrad Lorenz Institute of Ethology, University of Veterinary Medicine Vienna, Austria

With potential benefits including a lower risk of infanticide and the facilitation of communal breeding, reproductive synchronisation could be expected to evolve in many mammals. However, evidence that individuals synchronise their reproduction beyond mere seasonal effects remains scarce. Intensive research into oestrus synchronisation resulted in mixed findings, and many studies reporting synchronisation were later questioned based on methodological issues. We studied birth synchrony in a facultatively communal-breeding, human-commensal canid: free-Range use mongrel dogs (*Canis familiaris*). Using behavioural, reproductive and genetic data on 64 females, we investigated how kinship and relationship strength influence birth synchrony, and whether synchrony is associated with male monopolisation or with the occurrence of allomaternal care. Our results show that birth synchrony was higher among kin and that the probability of allonursing increased with increasing synchrony. Male monopolisation was not significantly related to the number of receptive females, suggesting that in this species, reproductive synchrony mainly evolved to allow for communal breeding. Additionally, parturition order within social groups was related to dominance status, indicating that female–female competition and avoidance of female infanticide may influence reproductive timing.

Do reptiles know what another reptile can see?

Anna Wilkinson¹, Finneas Porter¹, Masaki Tomonaga²

¹University of Lincoln, United Kingdom

² University of Human Environments, Japan

Understanding what another individual can see is a fundamental component of complex cognition and is likely to impact success at finding food, avoiding predators and responding to social interactions. There is evidence that reptiles can follow the gaze of a conspecific but, as yet, no evidence that they have an understanding of what that conspecific can see. The work so far has investigated this in a cooperative context, however, using a competitive context is likely to be more ecologically relevant. In this work we investigated whether red-footed tortoises (*Chelonoidis carbonaria*) could use the visual perspective of another individual when making a foraging decision. To do this a subject tortoise was placed opposite a competitor tortoise and the view of the competitor tortoise was manipulated. The findings suggest that tortoises may alter their behaviour on the basis of the visual perspective of another individual, the implications of which will be discussed.

Birds of a feather stick together: early-life social experiences shape chicken social networks during integration

Kathryn Willcox¹, Bram Vanden Broecke², Alizée Vernouillet³, Reinoud Allaert¹, Luc Lens¹, Frederick Verbruggen¹

¹Ghent University, Belgium

²University of Antwerp, Belgium

³University of Vienna, Austria

The structure of social groups can fluctuate. Integrating into a new group benefits fitness, survival, and access to social information. An individual's ability to socially integrate, and the subsequent structure of their group, may be influenced by their previous social experiences. To investigate this, we raised chicks (n=72) in either stable or unstable small groups, and at six-weeks-old, released them into an outdoor enclosure in larger homogenous 'supergroups' (stable-reared birds together; unstable-reared birds together). Across several days, we tracked the birds using an ultra-wideband positioning system and used this data to build daily proximity-based social networks. We found that the birds initially assorted based on familiarity, spending more time close to birds from their previous smaller groups, and that this assortment was stronger for the birds raised in stable groups than those raised in unstable groups. This assortment decreased across days, with individual-level network metrics indicating that the birds spent more time with others, and became less selective in their social partners, across days. These findings demonstrate the lasting impact of early social experiences on social behaviour and group dynamics, with implications for both the management of captive populations and for understanding the developmental drivers of social integration in the wild.

Behaviour-integrated dead-reckoning: hyper-detailed biologging on wild impala

Oakleigh Wilson, David Schoeman, Christofer Clemente
University of the Sunshine Coast, Australia

Understanding wild animal behaviour in the context of their immediate environment is a central challenge in ecology. Recently, advances in animal-borne biologging technology have enabled the development of increasingly sophisticated high-precision tracking methods. Among these, dead-reckoning can enable recreation of precise movement between GPS fixes, and machine-learning behavioural classification can predict fine-scale behaviours through time. The simultaneous collection of both data sources can provide unprecedented detailed insights into animal movement, activity, and behavioural budgets in context of local habitat. To date, however, while several studies have collected and presented both data types, they have not been analytically combined. Here, we trial integration of the two data sources; fine-tuning the dead-reckoning speed estimation method by first isolating specific locomotion periods and using predicted stationary periods to clean GPS error. In this case-study, we then compare the fine-scale behaviour and movement of impala (*Aepyceros melampus*) across reserves with and without predators to identify the effect of predation on trade-offs between locomotion, foraging, and vigilance on a new scale of precision.

Ontogenetic changes in colour and body size shift a non-toxic poison frog from cryptic to conspicuously mimetic

Ailis Wynne¹, Brendan L. McEwen², Justin Yeager³, Sandra Winters⁴, Yaren Çetin⁵, James B. Barnett¹

¹School of Natural Sciences, Trinity College Dublin, Ireland

²Psychology, Neuroscience & Behaviour, McMaster University, Canada

³Grupo de Investigación en Biodiversidad, Medio Ambiente y Salud (BIOMAS), Facultad de Ingenierías y Ciencias Aplicadas, Universidad de Las Américas, Chile

⁴Faculty of Biological and Environmental Sciences, University of Helsinki, Finland

⁵Faculty of Veterinary Medicine, Ankara Üniversitesi, Turkey

Ontogenetic colour change has been recorded across taxa, and is thought to be a response to temporal variation in the many selective pressures acting on coloration. In defended, aposematic, species, coloration may change from cryptic to conspicuous throughout life as the efficacy of camouflage declines and secondary defences strengthen. However, whether the same trade-offs apply to mimics, which lack secondary defences, remains unknown. Here we examined how camouflage and mimicry changed throughout the development of the non-toxic, Batesian mimic, *Allobates zaparo*. We compared various ages of this frog to the leaf litter background and to its model, the poison frog, *Ameerega bilinguis* using visual modelling and a series of screen-based detection trials with human subjects. Taken together, we found that mimicry and detectability increased throughout ontogeny, with juveniles matching the background and adults being conspicuously mimetic. However, the largest *Al. zaparo* showed both a decrease in mimicry and an increase in detectability which may suggest the additional influence of sexual selection. Our data reveal that the benefits of mimicry depend on the life stage of an individual.

Using touchscreens to study dogs' learning and memory of artificial sensory information

Siqi Yang-Fu¹, Christian Menne¹, Chiara Canori^{1,2}, Friederike Range^{1,§} and Tiago Monteiro^{1,3,§,*}

¹ Domestication Lab, Konrad Lorenz Institute of Ethology, Department of Interdisciplinary Life Sciences, University of Veterinary Medicine Vienna, Vienna, Austria

² Department of Medicine and Surgery, University of Parma, Parma, Italy

³ William James Center for Research, University of Aveiro, Aveiro, Portugal

§co-senior authors; *correspondence.

Touchscreen-based method has been widely adopted across diverse species to investigate perception, learning, and working memory, for their precise experimental control and automated data collection. However, their application to dogs remains limited (n=14 studies). To address previously identified issues, we developed a portable touchscreen apparatus and trained pet (n=15) and laboratory dogs (n=7) to perform on a matching-to-sample task using artificial coloured shapes. The apparatus includes a 17-inch monitor with an infrared touch frame mounted at an adjustable height, an automatic food dispenser, and custom software for controlling trial contingencies and logging timestamped task events and coordinates for all screen interactions. Task parameters, such as stimulus placement, timings, and reward contingencies, were fully automated to reduce handler effects and maximise experimental control. The resulting touch dataset enabled detailed analyses of learning curves, error patterns, individual variability and touch dynamics, extending beyond the traditional binary-choice outputs of more common manual tasks. Our findings demonstrate that dogs can reliably learn, remember, and interact with abstract stimuli presented on a touchscreen, supporting the feasibility of touchscreen-based methods for adaptable and reproducible cognitive and behavioural research in dogs.

Behavioural responses to long-term artificial light at night exposure in a freshwater amphipod (*Gammarus pulex*)

Elm Yeowart, Joachim G. Frommen
Manchester Metropolitan University, United Kingdom

Artificial Light at Night (ALAN) is among the fastest-growing anthropogenic stressors associated with urbanisation. Long-term exposure disrupts light-dependent behavioural processes across many taxa, such as migration and predator avoidance. Despite the ecological significance of many aquatic invertebrates as primary producers, little is understood about their behaviour in response to long-term ALAN exposure, and even less about how this sensory stimulus may impact aquatic ecosystems and community dynamics. In this study, specimens of an aquatic keystone species, the freshwater amphipod *Gammarus pulex*, will be collected from brooks and rivers in the Northwest of England that are either exposed to heavy light pollution or to natural light only. Specimens will be tested under artificial lighting in the lab to measure variation in photophobic behaviour. It is predicted that individuals that have adapted to constant artificial light will exhibit more relaxed photophobic behaviour than those that have developed in darker environments. The findings of this study will contribute to a greater understanding of the ecological consequences of Artificial Light at Night in freshwater ecosystems.

Colour morph dependent hunting strategies in West Atlantic trumpetfish (*Aulostomus maculatus*)

Lina Yousry¹, Sam Matchette², Andy Radford³, Maddie Gasparro³, James Herbert-Read¹

¹University of Cambridge, United Kingdom

²University of Oxford, United Kingdom

³University of Bristol, United Kingdom

Both prey and predators' success often depends on their appearance relative to the background. As the visual appearance of habitats changes, the effectiveness of predators' hunting strategies may also be altered. This effect may be particularly important for predators that exhibit colour morphs, however, how variation in predator colouration influences hunting success and strategy remains poorly understood. To investigate whether colour morphs specialise in specific hunting strategies and how this relates to ecological factors, we use a polymorphic coral-reef predator, the trumpetfish (*Aulostomus maculatus*), which occurs in three colour morphs: blue, brown, and yellow. This species employs both sit-and-wait and mobile roaming strategies, including a stalking strategy known as 'shadowing', in which trumpetfish hide behind larger fish. We show that different colour morphs adopt different strategies: the yellow morph hunts predominantly by roaming across the reef, the blue morph shadows most frequently, and the brown morph hunts mostly using sit-and-wait strategies. This is likely the result of differing success depending on how visible a colour morph is against the background, such as degraded coral rubble, live coral, blue water or other fish to shadow.

Flexible, abstract rhythm perception in bumblebees

Zijie Zeng^{1,2}, Andrew B Barron³, Fei Peng^{1,2,4*}, Cwyn Solvi^{1*}

¹Department of Neurobiology, School of Basic Medical Sciences, Southern Medical University, Guangzhou, China

²Department of Psychology, School of Public Health, Southern Medical University, Guangzhou, China

³School of Natural Sciences, Macquarie University, Sydney, Australia

⁴Department of Psychiatry, Zhujiang Hospital, Southern Medical University, Guangzhou, China

Flexible, abstract rhythm perception underpins human music, dance, and speech, but has, thus far, only been demonstrated in a few birds and mammals. Here, we show that bumblebees also form robust abstract rhythm representations. Free-flying bees learned to discriminate two arbitrary repeating flashing light sequences, balanced to preclude the use of any local cues. Bees successfully recognized these learned rhythmic patterns at novel, faster and slower tempi. Bees trained on vibrational patterns transferred their learning to equivalent flashing light patterns, demonstrating cross-modal rhythm perception. These findings suggest that an insect brain can encode and generalize arbitrary complex temporal patterns, suggesting that abstract rhythm perception can emerge from relatively simple neural architectures and pointing to deep evolutionary roots for a domain-general rhythm cognition across animals.

One-Sentence Summary: Bumblebees learn arbitrary patterns by their rhythmic structure and flexibly generalize across novel tempi and senses.

Smart monkeys, wasteful humans: lessons from urbanisation on baboons in Saudi Arabia

Dietmar Zinner¹, Ghanem Al-Ghamdi², Ahmed Boug³, Paula Pebsworth⁴

¹Cognitive Ethology Lab, German Primate Center DPZ, Göttingen, Germany

²Biology Department, Al-Baha University, Al-Baha, Saudi Arabia

³National Center for Wildlife, Riyadh, Saudi Arabia

⁴Department of Anthropology, The University of Texas at San Antonio, San Antonio, TX, United States of America

Co-occurrence of humans and nonhuman primates has a long history, but has been intensified recently due to human modifications of primate habitats, such as the sprawling of urban areas. Synanthropic primates typically possess remarkable behavioural and ecological plasticity, allowing them to respond quickly to environmental changes, among them macaque and baboon species. Several local populations of hamadryas baboons (*Papio hamadryas*) adopted an "urban" life-style in Saudi Arabia exploiting human derived resources. Over the last 50 years, Saudi Arabia has seen an extensive economic development. This has also led to significant urban sprawl in baboon habitats, accompanied with access to high quality human derived food at rubbish dumps, waste containers and by feeding of baboons by tourists and local people. Consequences of the synanthropic life of Arabian baboons have been a significant increase in baboon numbers and complains due to destruction of infrastructure, pollution of public parks, and physical attacks by baboons. In my contribution, I will inform about the situation of hamadryas baboons in Saudi Arabia and possible causes and consequences of human baboon conflicts.

What does the tapir say? Vocal behaviour in captive South American tapirs, *Tapirus terrestris*

Sue Anne Zollinger, Freya Cropper, Megan Brown, Natasha Brown, Abigail Butterworth, Mia Delahunt, Amy H. Robinson
Manchester Metropolitan University

Despite its status as the largest extant native terrestrial mammal in South America, surprisingly little is known about the vocal behaviour the South American tapir (*Tapirus terrestris*), or the social contexts in which its signals are used. Classed as "Vulnerable" on the IUCN Red List, the species occurs across much of tropical South America, where its population continues to decline. The species is typically solitary outside of the mating season, or mother-offspring associations, and its elusive, nocturnal behaviour makes them notoriously difficult to observe. Here we aimed to investigate vocal and social behaviours in captive tapirs housed at zoological institutions across Europe. We collected acoustic and video recordings of tapirs in a range of social groupings at 13 different zoos. From these recordings, we identified nine distinct vocalisation types, doubling the number of previously described calls. Furthermore, we provide evidence that social group composition (all male, all female, solitary, or mixed sex) has a significant effect on both the call type and call rate. Our findings provide much needed data on the vocal and social behaviour of this enigmatic mammal, while also offering insights for monitoring and potentially improving welfare of tapirs in captivity.

People and long-tailed macaques in agricultural landscapes: Investigating the human-macaque interface on Simeulue

Lianne J. Zonnebeld^{1,2}, Amanda Tan^{1,2}, Rachel Kendal^{1,2}, Kurnia Ilham³

¹Anthropology Department, Durham University, United Kingdom

²Durham Cultural Evolution Research Centre, United Kingdom

³The Long-tailed Macaque Project, Brørup, Denmark

Long-tailed macaques (*Macaca fascicularis*) frequently forage in agricultural areas, leading to repeated interactions with farmers. While cultivated crops can provide an abundant and palatable food source for macaques, crop foraging can have a negative impact on the livelihood of people who depend on farming practices. This often leads to retaliatory responses ranging from mild deterrence to killing. Understanding the factors shaping the human-macaque interface is therefore important for developing effective approaches to human-macaque coexistence and management.

Simeulue Island, Indonesia, is home to the Simeulue long-tailed macaque (*M. f. fusca*), a Critically Endangered endemic subspecies. The island is characterised by diverse agricultural systems, including subsistence and commercial coconut farming, providing an opportunity to investigate how the human-macaque interface varies across farming systems and communities. Through the past three years, the local NGO, the Long-Tailed Macaque Project (LTMP) has collaborated with local farmers regarding several community conservation projects.

In my PhD, I will collaborate with the LTMP to develop an integrated understanding of how human behaviour and perceptions of macaques, farming practices, and macaque behaviour jointly shape the human-macaque interface across Simeulue.

I will examine how human perceptions of macaques, macaque presence, and macaque responses to humans vary across farming systems and communities. In addition, I will investigate variation among macaque groups in crop-foraging behaviour and human-macaque interactions across subsistence and coconut farming systems, examining how farming practices and human responses influence these interactions. Lastly, I will investigate the effects of introducing Jack Bean (*Canavalia ensiformis*) as a potential crop deterrent - one of the future community conservation projects of the LTMP - assessing its influence on macaque crop-foraging behaviour, human-macaque interactions, and farmer perceptions and behaviour.

Findings will contribute to understanding how human perceptions, behaviour, and farming practices interact with macaque behaviour to shape human-macaque interactions, providing evidence to inform more effective and context-specific approaches to human-macaque management and coexistence on Simeulue.

Attendee List



Name	Institution
Adam Reddon	Liverpool John Moores University
Adelaide Sibeaux	University Caen Normandie
Adria LeBoeuf	University of Cambridge
Adrian Barnett	University of Greenwich
Aesha Lahiri	Indian Institute of Science Education and Research, Kolkata
Agnes Francila F	Indian Institute of Science Education and Research, Bhopal
Ahana Aurora Fernandez	University of Münster
Ailis Wynne	Trinity College Dublin
Alanna Brownell	Nottingham Trent University
Aldina M A Franco	University of East Anglia
Alex Kacelnik	University of Oxford
Alexandra Ash	University of Southampton
Alice Hill	University of Göttingen
Alizée Vernouillet	University of Cambridge Research Institute for Farm Animal Biology
Alvaro López Caicoya	Dummerstorf
Amelia Munson	University of Glasgow
Amelia St John Wallis	University of Bristol
Amine Kousba	Harvard University
Amy Morris-Drake	University of Bristol
Ana Cristina Gomes	Uppsala University
Ana Tomašić	University of Veterinary Medicine, Vienna
Andrew King	Swansea University
Andrew Smith	Anglia Ruskin University
Andy Radford	University of Bristol
Angela Dassow	Carthage College
Anita Curti	University of Turin
Anna Elisa Kempf	University of Veterinary Medicine, Vienna
Anna Nekaris	Anglia Ruskin University
Anna Pilská	Czech University of Life Sciences
Anna Wilkinson	University of Lincoln
Anuradha Batabyal	FLAME University Indian Institute of Science Education and Research, Kolkata
Anwesha Acharjee	Indian Institute of Science Education and Research, Kolkata
Ariana Weldon	Anglia Ruskin University
Arianna Passarotto	University of Glasgow
Arik Dorfman	Tel Aviv University
Arik Kershenbaum	University of Cambridge
Arthur Matte	University of Cambridge
Ashish Thakur	Indian Institute of Science Education and Research, Kolkata

Audun Slettan	University of Agder
Aurelie Jolivald	Nottingham Trent University
Awani Bapat	University of Vienna
Balázs Szigeti	Eötvös Loránd University
Ben Secker	Manchester Metropolitan University
Berta Canal	
Domenech	University of Torino
Beth Preston	Royal Veterinary College
Bhuvan Mangalore	Anglia Ruskin University
Bibiana Rojas	University of Veterinary Medicine, Vienna
Birgit Szabo	Ghent University
Blake Morton	University of Hull
Borbála Turcsán	Eötvös Loránd University
Bridgette Farnworth	Victoria University of Wellington
Bruna Bezerra	Universidade Federal de Pernambuco
Çağlar Akçay	Anglia Ruskin University
Camille Troisi	Université de Rennes
Carina Bruchmann	University of Göttingen
Carlos Abrahams	Wildlife Acoustics
Carolina Rocha	CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos
Charlotte Burn	Royal Veterinary College
Charlotte Christensen	University of Zurich
Charlotte Evans	Association for the Study of Animal Behaviour
Chiara Morosinotto	University of Padova
Christian Rutz	University of St Andrews
Christopher Schell	University of California, Berkeley
Christos Ioannou	University of Bristol
Ciaran Harris	University of Sussex
Claudia Wascher	Anglia Ruskin University
Coral Chell	University of Toronto
Cristina Romero Diaz	National Museum of Natural Sciences, Madrid
Cristina Tuni	University of Torino
Daisy Cooper	University of Cambridge
Dan Burnage	Anglia Ruskin University
Dan-Eric Nilsson	Lund University
Daniel Rivas Blanco	University of Veterinary Medicine, Vienna
Danielle Crowley	Leiden University
Daphne Cortese	Leibniz Institute of Freshwater Ecology and Inland Fisheries
Daria Siewierska	Jagiellonian University
Dietmar Zinner	German Primate Center
Diogo L Pires	University of Copenhagen
Doli Borah	University of Zurich
Eduardo Bessa	University of Brasília

Edward Andrews	Manchester Metropolitan University
Eleanor Pinkney	University of Plymouth
Elia Gatto	University of Ferrara
Elisa Frasnelli	University of Trento
Elm Yeowart	Manchester Metropolitan University
Elva Robinson	University of York
Emily Gilford	University of Exeter
Emma Berardi	Université de Toulouse
Emmanuelle Briolat	University of Exeter
Erick Cabrera	UC Davis
Erin McCallum	Swedish University of Agricultural Sciences
Eva Faria	University of Minho
Eva Millesi	University of Vienna
Eytan Avital	David Yalin College Jerusalem
Farkas Tóth	Eötvös Loránd University
Fay Clark	University of Bristol
Fletcher Noble	Newcastle University
Flora Talyigas	University of Chester
Francesca Cassola	Anglia Ruskin University
Franceska Furik	Eötvös Loránd University
Francisco Ruiz-Raya	University of Glasgow
Friederike Hillemann	Durham University
Friederike Range	University of Veterinary Medicine, Vienna
Gabrielle Davidson	University of East Anglia
Gareth Arnott	Queen's University Belfast
George M.W. Hodgson	City University of Hong Kong
Ginny Greenway	University of Cambridge
Giovanni Leonardi	University of Copenhagen
Giulia Severino	Universidad de Guadalajara
Grant Doering	Bilkent University
Gregory Albery	Trinity College Dublin
Gregory Eckhardt	University of Birmingham
Hannah Gower	University of Exeter
Hannah Parrett	
Helena Norman	University of Glasgow
India Sutherland	University of Liverpool
Irene Camerlink	Academy of Sciences
Jacob Dunn	Anglia Ruskin University
Jade Goddard	University of Chester
James Galloway	University of Exeter
Jennifer A. Colbourne	University of Veterinary Medicine, Vienna
Jennifer Harman	BMC Zoology
Jiaqing Cai	University of Exeter

Joab Malanda Osotsi	University of Debrecen
Joachim Frommen	Manchester Metropolitan University
João Almeida	ISPA-Instituto Universitário, Lisbon
Jol Tarongo	Newcastle University
Jolyne Surette	University of Windsor
Jonny Magnay	University of Glasgow
Josefine Bohr Brask	University of Copenhagen
Josh Arbon	University of Cambridge
Judith Varkevisser	Institute of Biology Leiden
Julia Mackenzie	Anglia Ruskin University
Julia Victoria Grabner	University of Vienna
Julian A. Chhatralia	University College London
Junhyung Lee	Jeonbuk National University
Kai Amino	Nagoya University
Kaleiah Schiller	University of Veterinary Medicine, Vienna
Karendeep Sidhu	University of Turin
Karoline Berweiler	University of Vienna
Kat Bebbington	Wageningen University
Katherine Todd	Manchester Metropolitan University
Kathryn Willcox	University of Ghent
Keya Matthew	Bangor University
Khawla Bouali	University of Debrecen
Krishna	
Balasubramaniam	Anglia Ruskin University
Lan Ma	Stockholm University
Lauren Brent	University of Exeter
Lauren Vane	University of Bristol
Léa Lorrain-Soligon	Sorbonne Université
Leela Channer	University of Exeter
Leonor Rocha Leal Da Silva De Mattos	Anglia Ruskin University
Lia Schlippe Justicia	University of Veterinary Medicine, Vienna
Liam Dougherty	University of Liverpool
Liam O'Leary	University of Windsor
Lianne Zonnebeld	Durham University
Lina Yousry	University of Cambridge
Lindsay Murray	University of Chester
Linnea Kivelä	University of Jyväskylä
Lisa Buck	Anglia Ruskin University
Lisandrina Mari	University of Jyväskylä
Lorenz Gyax	Humboldt University of Berlin
Louise Faure	Max Planck Institute of Animal Behavior
Louise Tovey	University of Cambridge
Luca G. Hahn	University of Exeter

Lucie Mellish	University of Lincoln
Lucile Doyen	National Cheng Kung University
Lucy Bates	University of Portsmouth
Luna Dudine	University of Padua
Lynn Robey	Centro de Investigaçao em Biodiversidade e Recursos Geneticos
Madison Bygrove	University of Windsor
Maeve Hoogland	University of Amsterdam
Malay Pandey	University of Turin
Manon Schweinfurth	University of St Andrews
Manuel Sapage	University of Saint Joseph
Mar Pineda	University of Glasgow
Marc Naguib	Wageningen University
Marco Graziano	University of Padova
Marco Maiolini	Leiden University
Margaret Hughes	University of Calgary
Maria Diez Leon	Royal Veterinary College, University of London
Maria Maclaren	Manchester Metropolitan University
Maria Pietrala	University of Lodz
Maria Rose-Møller	Anglia Ruskin University
Marie Barou-Dagues	La Rochelle University
Marie Bordes	University of Veterinary Medicine, Vienna
Mariela Morales	Anglia Ruskin University
Mariella Herberstein	Leibniz Institute for the Analysis of Biodiversity Change
Mark Dyble	University of Cambridge
Masashi Hiraki	The University of Osaka
Matteo Guidotti	Carl von Ossietzky University of Oldenburg
Max Carter-Brown	Anglia Ruskin University
Megan Keirnan	Cambridge University Press
Megan Lambert	University of Veterinary Medicine, Vienna
Megan Layton	University of South Wales
Melanie Gleske	University of Münster
Mélissa Peignier	Agroscope
Melissa Vanderheyden	University of Hildesheim
Michelle Spierings	Leiden University
Miguel Silva	Centro de Investigaçao em Biodiversidade e Recursos Geneticos
Mihika Sen	University of Helsinki
Mimi Peters	Anglia Ruskin University
Miriam Romagosa Vergés	Institut de Ciències del Mar
Mirza Altaf Baig	Aligarh Muslim University
Mónica Judá Ramires	Universidade do Minho
Monika Chandrashekar	Indian Institute of Science

Natalie Emerick	University of Windsor
Nick Jones	University of St Andrews
Nicola Jefferies	Swansea University
Nishant Kumar	Tata Institute of Fundamental Research, Bengaluru
Noa Danthony	University of Montpellier
Nora Carlson	University of Tokyo
Oakleigh Wilson	University of the Sunshine Coast
Océane Amichaud	Institut national de la recherche agronomique
Océane Bégassat	University of Rennes
Paty Celis	Anglia Ruskin University
Paula Stockley	University of Liverpool
Peter Neuhaus	University of Calgary
Phyllis Lee	University of Stirling
Quanxiao Liu	Charles University
Rachael Miller	University of Exeter
Raven Frank	Queen's University Belfast
Rebecca Berger	University of Veterinary Medicine, Vienna
Rebeka Kalousek	University of Vienna
Reese Miller	University of Windsor
Robert Boddington	Univeristy of Bristol & Macquarie University
Roberta Blake	Anglia Ruskin University
Robin Morrison	University of Zurich
Robyn Grant	Manchester Metropolitan University
Rossella Sini	University of Parma
Ryo Futamura	University of Tokyo Jawaharlal Nehru Centre for Advanced Scientific Research
S Anvitha	
Sabine Tebbich	University of Vienna
Samuel Richardson	University of Birmingham
Sandipa Das	Institute of Environment Education & Research, Bharati Vidyapeeth
Sandra Trigo	Centro de Investigação em Biodiversidade e Recursos Genéticos
Sara Torres Ortiz	University of Southern Denmark
Sarah Jowett	Anglia Ruskin University
Sarah Marshall	University of Veterinary Medicine, Vienna
Sarah McKissack	Anglia Ruskin University
Selvino de Kort	Manchester Metropolitan University
Shanta Sabnis	
Thomas	Anglia Ruskin University
Sofia Forss	University of Zurich
Sophia Daoudi-Simison	Newcastle University
Sophie Ridgway	University of Exeter
Stanley Edwards	University of Sussex
Stephan Reber	Lund University
Stéphanie Mercier	University of Zurich

Sue Anne Zollinger	Manchester Metropolitan University
Sylvain Lemoine	University of Cambridge
Tal Starobinsky	Tel Aviv University
Tamal Roy	Humboldt University of Berlin
Tamás Faragó	Eötvös Loránd University
Tanisha Henry	University of Calgary
Tapinder Sidhu	University of Portsmouth
Thomas Bugnyar	University of Vienna
Thurston Cleveland Hicks	University of Warsaw
Tiago Monteiro	University of Veterinary Medicine Vienna
Tiana Nealon	Anglia Ruskin University
Tim Caro	University of Bristol
Timo Roskam	University of Amsterdam
Tom Ings	Anglia Ruskin University
Tomasz Osiejuk	Adam Mickiewicz University
Tsz Hin Lo	Queen's University Belfast Indian Institute of Science Education and Research, Kolkata
Tuhin Subhra Pal	
Ulrika Candolin	University of Helsinki
Urša Blenkuš	University of Veterinary Medicine, Vienna
Vanessa Kern	University of Veterinary Medicine, Vienna
Victor Ajuwon	University of Cambridge
Vikram Gadagkar	Columbia University
Vildan Acar	University of East Anglia
Vitor Ferreira	Institut national de la recherche agronomique
Vittorio Ferrero	University of Turin
Vivek Nityananda	Newcastle University
Vojtěch Kasič	Czech University of Life Sciences
Wiebke Schuett	University of Sussex
Will Swaney	Liverpool John Moores University
Willa Lane	University of Cambridge
William O'Hearn	University of Exeter
Wolfgang Goymann	Max Planck Institute Seewiesen
Yasmin Naz Akyürek	University of Turin
Yi-Lin (Eleane) Jao	University of Cambridge
Ying-Hsuan Lin	Fu Jen Catholic University
Zachary Cloutier	University of Zurich
Zijie Zeng	Southern Medical University
Zsófia Bognár	Eötvös Loránd University



Anglia Ruskin University
East Road, Cambridge
CB1 1PT

aru.ac.uk