INTERNATIONAL CONGRESS NEUROETHOLOGY 2022

ICN2022

International Society for Neuroethology

24-29 July | Lisbon | Portugal

CONFERENCE PROGRAM

[Photo by Ana Rita Nunes]

CONTENTS

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WELCOME MESSAGE

Welcome from the President of the International Society of Neuroethology

On behalf of the Executive Committee and Council of the International Society of Neuroethology, I warmly welcome you to the 14th International Congress of Neuroethology here in the beautiful Portuguese capital of Lisbon! At last! As you are no doubt aware, due to the COVID-19 pandemic we were forced to make the unprecedented decision to postpone this Congress – venue, programme and all – by two years from 2020 to 2022. And here we are today with a Congress that promises to soothe the sadness, trauma and frustration of the last two years, and bring us together again to celebrate the remarkable animals and the stellar science we all love so much! Thanks to the hard work of the Lisbon Local Organising Committee (under the leadership of Rui Oliveira) and the ICN Program Committee (under the leadership of Cynthia Moss and Uwe Homberg), we have both a stunning venue (the Gulbenkian Foundation) and a truly outstanding scientific and social programme. With 533 registered delegates, 152 speakers and 291 posters, the 2022 Congress promises to be one of our most successful yet.

As the outgoing president it has been my greatest privilege and pleasure to lead this wonderfully diverse and rich international society. Our Congresses are the crowning events of our activities and are a place where old friends meet, new friends are made and great collaborations are created! And because of recent events, the emotional and scientific need for this is greater than ever. As always, we will showcase the very best science in our field and honour those who have made outstanding contributions to neuroethology. This week we will listen to no less than eleven superb Plenary Lecturers, all of whom are well-known leaders in the field. In addition to these, I have had the pleasure of personally selecting six outstanding lecturers for my Presidential Symposium that opens the Congress on Monday. I promise you that all 17 of these lectures will have you sitting on the edge of your seat! One of the Congress's most cherished events is the Young Investigator Award Symposium which will be held on Tuesday evening. Awarded for their ground-breaking research in Neuroethology, these four young scientists will share with us their amazing discoveries at the cutting edge of our field. This symposium is always a major highlight of the Congress and a must-attend event! Another must-attend event – where everyone is welcome! – is the Society's Business Meeting on Friday. Here you will learn the latest news from your society, celebrate the latest awards of prizes, fellowships and grants to our members,

find out about preparations for our 2024 Congress in Berlin, and have your say concerning where the 2026 Congress should be. So please do attend this meeting! But apart from all this, and the outstanding program of talks and posters, the program is absolutely packed with social events and workshops for our youngest members as well as an excellent event on Tuesday organised by our new Inclusion and Diversity committee.

So please enjoy this remarkable event that has always been one of the absolute high points of my academic calendar! No matter whether you are attending our Congress for the eighth time or are here for the very first time, I hope you experience this week as every bit as amazing and inspiring as I always have at every congress I have attended! My warmest and sincerest welcome to the 14th International Congress of Neuroethology!

Your President,
Eric Warrant

WELCOME MESSAGE

Welcome from the Chair of the Local Organizing Committee

Welcome to Lisbon and to the 14th International Congress of Neuroethology (ICN), a regular meeting of the International Society for Neuroethology (ISN). We are very pleased to finally host ICN2022 in Lisbon, after having to post-pone the 2020 meeting due to the Covid pandemic. It is with great satisfaction that we are able to meet in person again after a long period of restricted interactions, and we hope ICN2022 will offer a much expected opportunity to meet old friends and make new ones within the growing community of neuroethologists and akin. The Lisbon area, with its sunny days and mild summer nights, its hospitality, and its many bars and restaurants, offers the perfect setting for getting social again!

Lisbon hosts internationally significant research centers in the fields of Neuroscience and Behavior, such as the Gulbenkian Institute of Science, a branch of the Gulbenkian Foundation with a focus on multidisciplinary research in the Life Sciences; ISPA, a University Institute with an emphasis on Mind and Behavioral Sciences; and the Neuroscience Program at the Champalimaud Foundation, which jointly build the Local Organizing Committee. Moreover, in short distance from the city you will find nature areas with an inspiring fauna for the study of behaviour, from a resident bottlenose dolphin population to many birds, fish and invertebrates, currently studied by different local labs.

The conference venue, located at the headquarters of the Gulbenkian Foundation, boasts a privileged location in central Lisbon, right next to the famous Gulbenkian Museum, and the Center for Modern Art, with its surrounding gardens where the Summer Jazz Festival takes place. This location has been chosen because it combines an excellent congress venue, plenty of accommodation, a relaxed environment, and an offer of cultural activities, which we hope will provide the right environment for networking among delegates.

ICN2022 will gather international professionals, academia members and students that share an interest in the study of the mechanisms underlying animal behavior. The conference program offers an exciting line-up of invited plenary talks from distinguished researchers covering topics such as stereoscopic vision in the praying mantis, visual control of locomotion in fruit-flies, the evolution of color vision in jumping spiders, host-seeking behaviors of nematode parasites, biomechanics and

neural dynamics of birdsong production, the neural basis of social behavior, vision and foraging in butterflies, and molecular adaptations to hibernation in mammals, and the mechanisms of feeding behavior in fruit-flies. There will also be a program which includes 1 Presidential symposium and 12 symposia, selected from the call for symposia, that will span a wide range of neuroethology topics that will help advance and foster scientific research, education and training, and applications. Finally, the program will also include 80 contributed talks and close to 300 poster presentations, which will enable all delegates to present their work and to have the opportunity to discuss the most recent developments in their research fields. With over 500 registered delegates from all geographic regions, working across a wide span of topics and taxa, ICN2022 represents a major gathering of knowledge on neuroethology at the global scale. We hope you will enjoy it and take the most out of your experience in Lisbon.

On behalf of the many people who have helped to put this Congress together, namely the ISN Executive Board, on the person of its President Eric Warrant, the ICN Program Committee, on the person of its Chairs, Uwe Homberg and Cynthia Moss, all the Local Organizing Committee, with special mention to Marta Moita, Susana Lima and Ana Félix, and the superb events staff at IGC, ISPA and the FCG, we wish to Welcome all of you to ICN2022!

Rui F. Oliveira,
Chair of the LOC / ICN2022

CODE OF CONDUCT

Through our biannual congresses, the International Society for Neuroethology (ISN) fosters open exchange and critical evaluation of scientific ideas, facilitates development of new collaborations, and enables participants to find employment or recruit people to fill positions. To these ends, the ISN wants its meetings to be inclusive and for participants to feel safe and welcome.

All participants at the International Congress of Neuroethology (ICN) should behave professionally, treating each other with respect and consideration. This includes thoughtful appreciation of each one's own professional status and position and an attempt to understand the status and position of others who may not share the same background or privilege. An open, inclusive environment is one where all participants emphasize supportive and empathetic behaviors. Participants must recognize that power and status affect how others receive words and actions and how others express themselves (or feel limited in their expression). It is not easy to flawlessly respect boundaries that may appear hidden or to understand how different backgrounds affect the perception of shared experiences, but respect and empathy for all should be the over-riding principle.

The following behaviors are strictly prohibited whether the behavior is expressed physically, verbally, or in writing.

Sexual harassment of any participant, including scientific attendees and their guests, vendors, support staff, service providers, and volunteers. Harassment includes but is not limited to unwelcome conduct of a sexual nature, including advances or propositions, requests for sexual favors, sexually explicit jokes, unnecessary touching, catcalling, and other conduct of a sexual nature. Participants must recognize that behavior that is acceptable to some people may not be acceptable to all, and that people in junior positions or from less privileged background may be reluctant to explicitly object to unwelcome behavior.

Discrimination of any kind, including but not limited to discrimination on the basis of race, ethnicity, culture, national origin, sexual orientation, gender identity and expression, social and economic class, educational level, immigration status, age,

ability, marital or family status, political belief, or religion. Be aware that jokes or attempts to make light of status differences or physical appearance generally reinforce, rather than diminish, power differences. Words or actions that manipulate status or power to belittle, offend, or otherwise disenfranchise meeting attendees are unacceptable, as are inappropriate comments made in a joking manner.

Bullying, intimidation, and physical harm of any participant through behavior that frightens, threatens, or humiliates the recipient, including disruption of presentations as well as stalking or following. We recognize that scientific disagreements will sometimes arise and we in no way want to stifle scholarly and scientific discussion, but these discussions should be fair and respectful, focusing on the science rather than the individuals discussing it.

Retaliation for reporting inappropriate behavior, as well as **bad faith reports** of inappropriate behavior, are unacceptable and will be considered a violation of the code of conduct.

Reports of violations of the code of conduct will be treated with strict confidentiality. Those experiencing or witnessing violations of the code of conduct can report them in person to any ISN officer or member of the ISN Inclusion and Diversity Committee (easily identifiable by their pink conference name tags) or in writing by sending an email to any ISN officer or member of the ISN Inclusion and Diversity Committee (whose email addresses are posted in the ICN website, www.neuroethology.og). If further anonymity is desired, reports can be sent from a newly-created, free Gmail account. All reports of misconduct will be investigated thoroughly, fairly, and as quickly as possible by the Inclusion and Diversity Committee, who will provide all parties with a chance to explain themselves and will treat such matters with strict confidentiality.
ICN organizers and ISN officers reserve the right to enforce this code of conduct in any manner deemed appropriate. Anyone violating the code of conduct will be asked to stop engaging in inappropriate behavior and may be prohibited from presenting, expelled from the meeting without refund, prohibited from attending future meetings, and/or have their membership revoked. Actions that violate local laws may be reported to local law enforcement.

GENERAL INFORMATION

Duplication and recording
Unauthorized photography, audio taping, video recording, digital taping or any other form of duplication is prohibited in the congress sessions.

Internet
Wireless internet (Wi-Fi) will be available free of charge for delegates at the main venue. Join the FCG Eventos or FCG Eventos 5GHz Wi-fi networks. Password required: #GULBENKIAN#.

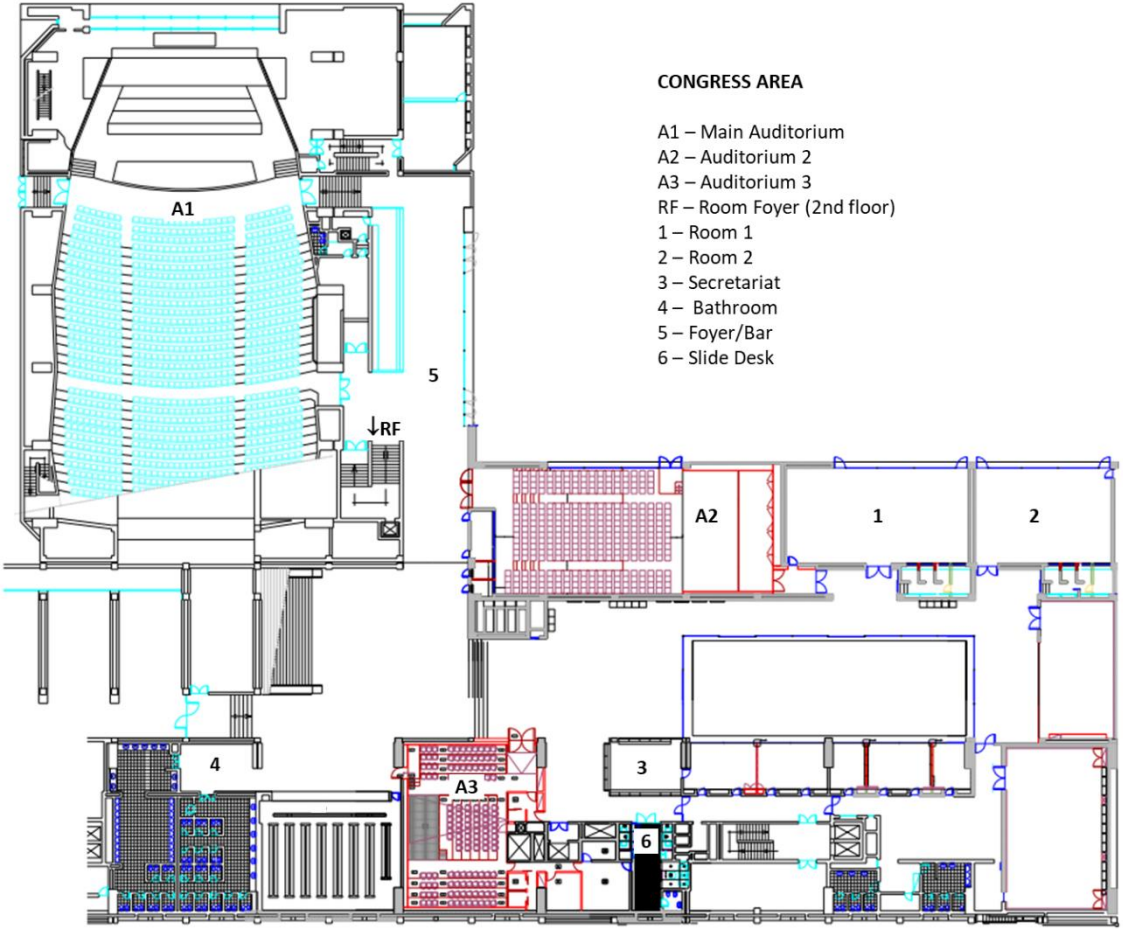
Name badges
For security reasons, delegates, speakers and exhibitors are required to wear their name badge to all sessions and social events. Entrance into sessions is restricted to registered delegates only.

Speakers
Please ensure you are available in your presentation room at least 10 minutes before the start of the session. Please be sure to load your presentation with the AV technician at the Slide Desk at least 48h before the session. The presentation should be carried on a USB flash drive, in PDF or PPTX formats, and identified with the day, name and type of session (e.g., Monday_Name_ParticipantSymposium1.pdf). Please, set your presentation slide size to a widescreen (16:9) aspect ratio. In case you would like to present videos, these files should be also deposited at the Slide Desk of the venue.

In multi- contributor sessions (e.g., symposia), speakers will have to use the PC available at the congress room and will not be authorized to use their laptops. Mac users should confirm if their presentation is shown correctly on a PC system. Only plenary speakers are allowed to use their personal laptops if they wish.

CONFERENCE MAP

VENUE MAP



CONGRESS AREA

A1 – Main Auditorium
A2 – Auditorium 2
A3 – Auditorium 3
RF – Room Foyer (2nd floor)
1 – Room 1
2 – Room 2
3 – Secretariat
4 – Bathroom
5 – Foyer/Bar
6 – Slide Desk

CONFERENCE SCHEDULE

Time	SUNDAY, JULY 24	MONDAY, JULY 25	TUESDAY, JULY 26	WEDNESDAY, JULY 27	THURSDAY, JULY 28	FRIDAY, JULY 29
9:00–9:30		**Presidential Symposium** (Main Auditorium)	**Plenary 2 – Eugenia Chiappe** (Main Auditorium)	**Plenary 4 – Elissa Hallem** (Main Auditorium)	**Plenary 6 – Hideaki Takeuchi** (Main Auditorium)	**Plenary 8 – Elena Gracheva** (Main Auditorium)
9:30–10:00						
10:00–10:30			**Coffee Break**	**Coffee Break**	**Coffee Break**	**Coffee Break**
10:30–11:00		**Coffee Break**	**Symposia 1–4**	**Symposia 5–8**	**Symposia 9–12**	**Participant Symposia 5–8**
11:00–11:30		**Presidential Symposium** (Main Auditorium)				
11:30–12:00						
12:00–12:30						
12:30–13:00		**Lunch followed by Early Career Event** (Auditorium 2)	**Lunch followed by Diversity and Inclusion Meeting** (Auditorium 2)	**Lunch followed by ISN Council Meeting** (Auditorium 3)	**Lunch**	**Lunch**
13:00–13:30						
13:30–14:00						
14:00–14:30		**Plenary 1 – Jenny Read** (Main Auditorium)	**Plenary 3 – Nathan Morehouse** (Main Auditorium)	**Plenary 5 – Ana Amador** (Main Auditorium)	**Plenary 7 – Michiyo Kinoshita** (Main Auditorium)	**Plenary 9 – Carlos Ribeiro** (Main Auditorium)
14:30–15:00						
15:00–15:30		**Poster Session I** (Room 1 + Room 2)	**Participant Symposia 1–4**	**Free afternoon (Optional: Excursion to the Lisbon Oceanarium)**	**Coffee Break**	**Coffee Break**
15:30–16:00					**Heiligenberg Lecture – José Luis Peña** (Main Auditorium)	**Participant Symposia 9–12**
16:00–16:30						
16:30–17:00			**Coffee Break**		**Poster Session II** (Room 1 + Room 2)	
17:00–17:30			**Huber Lecture – Paul Katz** (Main Auditorium)			**ISN Business Meeting** (Auditorium 2)
17:30–18:00						
18:00–18:30	**Reception and Opening Ceremony** (IGC, Oeiras)	**Student/Post–doc Icebreaker** (Foyer/Bar)	**Young Investigator Awards** (Main Auditorium)			**Free Time**
18:30–19:00						
19:00–19:30						**Banquet Dinner** (Casa do Alentejo, Lisboa)
19:30–20:00						
20:00–20:30						
20:30–21:00						

CONFERENCE PROGRAM

SUNDAY, 24 JULY 2022

Location: Gulbenkian Institute of Science (Oeiras)

18:00 – 20:00	**WELCOME RECEPTION AND OPENING CEREMONY** Registration, Welcome drink and light buffet
18:45–19:00	**Opening ceremony/ Welcome address**
19:00–20:00	**Welcome reception session: "Brain and Behavior: Art and Science"** Chair: Rui F. Oliveira (*IGC and ISPA, Portugal*)
	Art-science collaborations inspired by animal behavior Alex Jordan (*MPI for Collective Behavior, Germany*)
	AI, robot art and transhuman creativity Leonel Moura (*visual artist, Portugal*)
	"Killer Bee Queens": bee inspired alternative rock music Lars Chittka (*QMUL, London, UK*)

MONDAY, 25 JULY 2022

Main Venue: The Gulbenkian Foundation (Lisbon)

8:00–17:00 **Registration**
Location: Secretariat

9:00 – 10:30 **PRESIDENTIAL SYMPOSIUM**
Chair: Eric Warrant
Location: Main Auditorium

PS1 **9:00–9:30** **Specializations in optic flow encoding in the pretectum and accessory optic system of hummingbirds and zebra finches**
Doug Altshuler (*University of British Columbia, Canada*)

PS2 **9:30–10:00** **Vision and signaling behavior in cleaner shrimp-client fish mutualisms**
Eleanor Caves (*University of California Santa Barbara, USA*)

PS3 **10:00–10:30** **The mind of a bee**
Lars Chittka (*Queen Mary College, University of London, UK*)

10:30–11:00 **Coffee Break**

11:00 – 12:30 **PRESIDENTIAL SYMPOSIUM**
Chair: Eric Warrant
Location: Main Auditorium

PS4 **11:00–11:30** **How behaviors evolve**
Hopi Hoekstra (*Harvard University, USA*)

PS5	**11:30–12:00**	**Chasing the molecular bases of migratory orientation and magnetoreception in monarch butterflies** Christine Merlin (T*exas A&M University, USA*)
PS6	**12:00–12:30**	**High-speed decision making in hunting archerfish** Stefan Schuster (*University of Bayreuth, Germany*)

12:30–14:00	**Lunch**

13:00 – 14:00	**EARLY CAREER EVENT** Chairs: Claire Rusch and Saumya Gupta Location: Auditorium 2

14:00 – 15:00	**PLENARY SESSION 1** **Stereoscopic vision in the praying mantis** Jenny Read (*Newcastle University, UK*) Chair: Barbara Webb Location: Main Auditorium

15:00–18:00	**POSTER SESSION I** Location: Room 1 and Room 2 (Please see list of posters at the end section of this program)

18:00–20:00	**STUDENT/POST–DOC ICEBREAKER** Location: Foyer/Bar

TUESDAY, 26 JULY 2022

Main Venue: The Gulbenkian Foundation (Lisbon)

8:00–17:00 **Registration**
Location: Secretariat

9:00 – 10:00 **PLENARY SESSION 2**
Brain-body interactions underlie flexible and rapid control of walking in *Drosophila*
Eugenia Chiappe (*Champalimaud, Portugal*)
Chair: Stanley Heinze
Location: Main Auditorium

10:00–10:30 **Coffee Break**

10:30–12:30 **CONCURRENT INVITED SYMPOSIA 1–4**

10:30 – 12:30 **INVITED SYMPOSIUM 1 – THE NEURAL BASIS OF COLLECTIVE BEHAVIOR**
Chair: Amir Ayali
Location: Main Auditorium

S1.1 **10:30–10:54** **Regulating cooperative behavior**
Barry Condron (*University of Virginia, USA*)

S1.2 **10:54–11:18** **Perception and integration of multiple simultaneous visual inputs in locust swarming**
Itay Bleichman (*Tel Aviv University, Israel*)

S1.3 **11:18–11:42** **Cortical coding of communication calls serving social interactions**
Julie Elie (*University of California, USA*)

S1.4	**11:42–12:06**	**Zebrafish shoaling: Visual recognition of conspecifics by a tecto-thalamic neural circuit** Herwig Baier (*Max Planck Institute for Biological Intelligence, Germany*)
S1.5	**12:06–12:30**	**Collective behaviour and electrocommunication in a mormyrid weakly electric fish** Martin Worm (*University of Bonn, Germany*)

10:30 – 12:30	**INVITED SYMPOSIUM 2 – MECHANISMS OF ECHO–ACOUSTICALLY GUIDED NAVIGATION IN BIRDS AND MAMMALS** Chairs: Susanne Hoffmann and Julio Hechavarria Location: Auditorium 2

S2.1	**10:30–11:00**	**Echolocation-specific specializations in Oilbirds** Susanne Hoffmann (*Max Planck Institute for Biological Intelligence (in Foundation), Germany*)
S2.2	**11:00–11:30**	**Neural underpinnings of auditory motion tracking** Clarice Diebold (*Johns Hopkins University, USA*)
S2.3	**11:30–12:00**	**Do bats use echolocation for large-scale navigation?** Aya Goldshtein (*Max Planck Institute of Animal Behavior, Germany*)
S2.4	**12:00–12:30**	**Echo-acoustic behaviour and brain activity in people** Lore Thaler (*Durham University, UK*)

10:30 – 12:30	**INVITED SYMPOSIUM 3 – SENSORY INTEGRATION** Chair: Lidia Szczupak Location: Auditorium 3

S3.1	**10:30–11:00**	**Multisensory integration in the context of escape, from cell circuits to behavior** Violeta Medan (*University of Buenos Aires, Argentina*)
S3.2	**11:00–11:30**	**Sensory processing in larval zebrafish: Perspectives from whole-brain calcium imaging** Ethan Scott (*University of Queensland, Australia*)

S3.3	**11:30–12:00**	**Distributed multisensory processing systems for temporal frequency integration** Jeffrey M. Yau (*Baylor College of Medicine, USA*)
S3.4	**12:00–12:30**	**Sensing scents: structural mechanism of odor recognition in insect olfactory receptors** Josefina del Mármol (*Harvard Medical School, USA*)

	10:30 – 12:30	**INVITED SYMPOSIUM 4 – THE EVOLUTION OF SOUND LOCALIZATION CIRCUITS IN LAND VERTEBRATES** Chairs: Catherine Carr and Jakob Christensen–Dalsgaard Location: Room Foyer
	10:30–10:40	**Introduction** Christine Koeppl (University *of Oldenburg, Germany)*
S4.1	**10:40–11:08**	**Hearing with a non-tympanic ear; implications for the evolution of hearing** Jakob Christensen-Dalsgaard (*University of Southern Denmark, Denmark*)
S4.2	**11:08–11:35**	**Directional hearing in birds, crocodilians and lizards** Catherine Carr (*University of Maryland, USA*)
S4.3	**11:35–12:03**	**A developmental perspective on the conservation, divergence and convergence of sound localisation circuits** Marcela Lipovsek (*University College London, UK*)
S4.4	**12:03–12:30**	**The spatial representations of sound position in the mammalian auditory cortex** Benedikt Grothe (*Ludwig–Maximilian–University, Germany*

12:30–14:00 **Lunch**

13:00 – 14:00	**DIVERSITY AND INCLUSION MEETING** Organizers: ISN Inclusion and Diversity Committee Location: Auditorium 2

14:00 – 15:00	**PLENARY SESSION 3** **Male courtship, female visual attention, and the evolution of display complexity in jumping spiders** Nathan Morehouse (*University of Cincinnati, USA*) Chair: Kentaro Arikawa Location: Main Auditorium

15:00–16:30	**CONCURRENT PARTICIPANT SYMPOSIA 1–4**

15:00–16:30	**PARTICIPANT SYMPOSIUM 1 – SPATIAL ORIENTATION AND NAVIGATION I** Chair: Angeles Salles Location: Main Auditorium

T1.1	**15:00–15:15**	**Neural representation of goal direction in the monarch butterfly central complex** Jerome Beetz (*University of Wuerzburg, Germany*)
T1.2	**15:15–15:30**	**Cataglyphis' magnetic compass throughout the ant's foraging career** Pauline N. Fleischmann (*University of Würzburg, Germany*)
T1.3	**15:30–15:45**	**Collective navigation as a potential solution for precise navigation and homing in magnetoreceptive species** Sönke Johnsen (*Duke University, USA*)
T1.4	**15:45–16:00**	**The honeybee's polarization compass—good dancers compensate for bad signal** James Foster (*University of Konstanz, Germany*)

T1.5	**16:00–16:15**	**Heading memory during celestial navigation in *Drosophila*** Ysabel Giraldo (*University of California, USA*)
T1.6	**16:15–16:30**	**Weighted cue integration for straight–line orientation** Elin Dirlik (*Lund University, Sweden*)

	15:00–16:30	**PARTICIPANT SYMPOSIUM 2 – MOTOR CONTROL I** Chair: Jay Stafstrom Location: Room Foyer

T2.1	**15:00–15:15**	**Motor adaptation is a possible explanation for light refraction correction in the archerfish** Ronen Segev (*Ben–Gurion University of the Negev, Israel*)
T2.2	**15:15–15:30**	**Birds breathe at an aerodynamical resonance** Gabriel Mindlin (*Universidad de Buenos Aires and CONICET, Argentina*)
T2.3	**15:30–15:45**	**Neural mechanisms of cephalopod camouflage** Xitong Liang (*Max Planck Institute for Brain Research, Germany*)
T2.4	**15:45–16:00**	**How *Octopus bimaculoides* hunt with eight arms, their strategy, lateralization, and arm recruitment principles.** Trevor Wardill (*University of Minnesota, USA*)
T2.5	**16:00–16:15**	**Neural organization of jaw movements in fish** Duncan Mearns (*MPI for Biological Intelligence, Germany*)
T2.6	**16:15–16:30**	**Sensorimotor transformation in the brain of *C.elegans*** Anton Parinov (*University of Vienna, Austria*)

	15:00–16:30	**PARTICIPANT SYMPOSIUM 3 – LEARNING, MEMORY AND COGNITION I** Chair: Mercedes Bengochea Location: Auditorium 3

T3.1	**15:00–15:15**	**The impact of brain lateralization on quantity discrimination abilities in zebrafish (*Danio rerio*)** Maria Elena Miletto Petrazzini (*University of Padova, Italy*)
T3.2	**15:15–15:30**	**An insect brain organizes numbers on a left–to–right mental number line** Martin Giurfa (*CNRS – University Paul Sabatier Toulouse III, France*)
T3.3	**15:30–15:45**	**Neuron counts reveal the evolution of brain complexity in land vertebrates** Kristina Kverková (*Charles University, Czech Republic*)
T3.4	**15:45–16:00**	**Learning with a decentralized nervous system in the brittle star *Ophiocoma echinata*** Julia C. Notar (*Duke University, USA*)
T3.5	**16:00–16:15**	**First evidence of advanced learning in jellyfish** Anders Garm (*University of Copenhagen, Denmark*)
T3.6	**16:15–16:30**	**Learning and innate predispositions contribute to variation in songbird introductory gestures** Raghav Rajan (*IISER Pune, India*)

	15:00–16:30	**PARTICIPANT SYMPOSIUM 4 – VISUAL SYSTEM I** Chair: Alejandro Cámera Location: Auditorium 2

T4.1	**15:00–15:15**	**To see with multiple rhodopsins: extraordinary vision in the deep-sea fishes** Zuzana Musilova (*Charles University, Czech Republic*)
T4.2	**15:15–15:30**	**Plasticity of coral reef fish vision in a changing world** Fabio Cortesi (*University of Queensland, Australia*)
T4.3	**15:30–15:45**	**Neural basis of object recognition in the visual system of the archerfish** Svetlana Volotsky (*Ben–Gurion University of the Negev, Israel*)

T4.4	**15:45–16:00**	**Brain-wide visual habituation networks and escape responses to looming stimuli, and the effects of saliency, timing, luminance and motion** Emmanuel Marquez Legorreta (*University of Queensland, Australia*)
T4.5	**16:00–16:15**	**A map of trematode worm infection of the dragonfly (*Sympetrum sp*.) brain: Anatomical evidence for parasite control of behavior** Joshua Martin (*Colby College, USA*)
T4.6	**16:15–16:30**	**Visual system and its developmental changes in European cyprinid fishes (family *Cyprinidae*)** Veronika Truhlarova (*Charles University, Czech Republic*)

16:30–17:00	**Coffee Break**

17:00–18:00	**FRANZ HUBER LECTURE** **The four Fs of studying neural circuits underlying behavior: form, function, phylogeny, and fortune** Paul Katz (*University of Massachusetts Amherst, USA*) Chair: Karen Mesce Location: Main Auditorium

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18:00–20:00	**YOUNG INVESTIGATOR AWARDS** Location: Main Auditorium

Y.1	**18:00–18:30**	**Blink and you'll miss it: Ballistic predatory behavior in the ogre–faced spider** Jay Stafstrom (*Cornell University, USA*)
Y.2	**18:30–19:00**	**Bone conduction of sound supports aerial hearing and directional sensitivity in salamanders** Grace Capshaw (*Johns Hopkins University, USA*)

Y.3	**19:00–19:30**	**Numerical discrimination in *Drosophila melanogaster*** Mercedes Bengochea (*Institut du Cerveau–Paris Brain Institute, France*)
Y.4	**19:30–20:00**	**Specialized mechanosensors in flying insects** Alexandra Yarger (*Imperial College London, UK*)

WEDNESDAY, 27 JULY 2022

Main Venue: The Gulbenkian Foundation (Lisbon)

8:00–14:00 **Registration**
Location: Secretariat

9:00 – 10:00 **PLENARY SESSION 4**
The neural basis of host seeking in skin-penetrating parasitic nematodes
Elissa Hallem (*UCLA, USA*)
Chair: Frederic Libersat
Location: Main Auditorium

10:00–10:30 **Coffee Break**

10:30–12:30 **CONCURRENT INVITED SYMPOSIA 5–8**

10:30 – 12:30 **INVITED SYMPOSIUM 5 – MEMORIAL SYMPOSIUM IN HONOR OF BARRIE FROST AND JACK PETTIGREW, LEADERS IN THE FIELD OF NEUROETHOLOGY**
Chair: Hermann Wagner
Location: Auditorium 2

S5.1 10:30–11:00 **How the stars and the Earth's magnetic field guide the long migratory journey of an Australian moth – a tribute to Professor Barrie Frost**
Eric Warrant (*Lund University, Sweden*)

S5.2 11:00–11:30 **Quantum birds: The magnetic compass sense of night-migratory songbirds**
Henrik Mouritsen (*University of Oldenburg, Germany*)

S5.3	**11:30–12:00**	**Remembering Barrie Frost and Jack Pettigrew: Eye movements in birds and in the weird, typically Australian creatures, mantis shrimps** Tom Cronin (*University of Maryland, USA*)
S5.4	**12:00–12:30**	**Jack Pettigrew – the secret to a successful scientific career** Justin Marshall (*University of Queensland, Australia*)

	10:30 – 12:30	**INVITED SYMPOSIUM 6 – OVERLOOKED FOR DECADES? MOTONEURON INVOLVEMENT IN RHYTHM GENERATION** Chairs: Erik Zornik and Boris Chagnaud Location: Room Foyer
S6.1	**10:30–11:00**	**Exploring the role of motor feedback in vocal evolution** Charlotte Barkan (*Reed College, USA*)
S6.2	**11:00–11:30**	**The involvement of motoneurons in the patterning of spinal locomotor patterns in zebrafish** Abdeljabbar El Manira (*Karolinska Institute, Sweden*)
S6.3	**11:30–12:00**	**A single motor neuron determines the rhythm of early motor behavior in *Ciona*** Kohji Hotta (*Keio University, Japan*)
S6.4	**12:00–12:30**	**Motoneurons modulate leech motor pattern through central connections** Lidia Szczupak (*University of Buenos Aires, Argentina*)

	10:30 – 12:30	**INVITED SYMPOSIUM 7 – NEW TOOLS TO STUDY BEHAVIOUR IN THE FIELD: INSIGHTS FROM INSECT NAVIGATION** Chairs: Michael Mangan and Antoine Wystrach Location: Main Auditorium
S7.1	**10:30–11:00**	**Quantifying insect behaviour in the wild – Fully automatic tracking and habitat reconstruction from a single hand-held camera** Lars Haalck (*University of Münster, Germany*)

S7.2	**11:00–11:30**	**The Antarium: Manipulating the visual world of navigating insects** Jochen Zeil (*Australian National University, Australia*)
S7.3	**11:30–12:00**	**In field neural manipulations to investigate the basis of working memory for insect navigation** Ayse Yilmaz (*Lund University, Sweden*)
S7.4	**12:00–12:30**	**Brains-on-board robots: testing embodied neural circuits in the wild** Andy Philippides (*University of Sussex, UK*)

	10:30 – 12:30	**INVITED SYMPOSIUM 8 – REDEFINING THE BOUNDARIES OF PHEROMONE ACTION: PHEROMONES AS NEUROMODULATORS OF LEARNING AND MEMORY** Chairs: Martin Giurfa and Patrizia d'Ettorre Location: Auditorium 3
S8.1	**10:30–11:00**	**Sexual pheromones, reward and learning in female rodents** Carmen Agustín-Pavón (*University of Valencia, Spain*)
S8.2	**11:00–11:30**	**Pheromones modulate learning and memory retention in honeybees according to their valence** David Baracchi (*Università degli Studi di Firenze, Italy*)
S8.3	**11:30–12:00**	**The alarm pheromone, formic acid, increases nestmate recognition efficiency in ants** Patrizia d'Ettorre (*University Sorbonne Paris Nord, France*)
S8.4	**12:00–12:30**	**Circuits and mechanisms of pheromone-evoked courtship behavior in the mouse** Lisa Stowers (*Scripps Research Institute, USA*)

12:30–14:00 **Lunch**

13:00 – 14:00	**ISN COUNCIL MEETING** Location: Auditorium 3

14:00 – 15:00	**PLENARY SESSION 5** **Rhythms in a songbird brain: biomechanics and neural dynamics** Ana Amador (*University of Buenos Aires and CONICET, Argentina*) Chair: Lidia Szczupak Location: Main Auditorium

17:00–18:30	**Excursion to the Lisbon Oceanarium** (Paid activity; limited number of participants)

THURSDAY, 28 JULY 2022

Main Venue: The Gulbenkian Foundation (Lisbon)

8:00–16:00 **Registration**
Location: Secretariat

9:00 – 10:00 **PLENARY SESSION 6**
Exploring the neural geography of the social brain using medaka fish
Hideaki Takeuchi (*Tohoku University, Japan*)
Chair: Rui Oliveira
Location: Main Auditorium

10:00–10:30 **Coffee Break**

10:30–12:30 **CONCURRENT INVITED SYMPOSIA 9–12**

10:30 – 12:30 **INVITED SYMPOSIUM 9 – MAKING BIOROBOTS BEHAVE: CONNECTING ENGINEERING AND ANIMAL BEHAVIOR**
Chairs: Barry Trimmer and John Long
Location: Auditorium 2

S9.1 10:30–11:00 **Active touch sensing in mammals and robots**
Tony Prescott (*University of Sheffield, UK*)

S9.2 11:00–11:30 **Title to be announced**
Huai-Ti Lin (*Imperial College London, UK*)

S9.3 11:30–12:00 **Exploring the interaction of feedforward and feedback control in the spinal cord using biorobots**
Auke Ijspeert (*École Polytechnique Fédérale de Lausanne, Switzerland*)

S9.4	**12:00–12:30**	**Navigation in insects and robots** Barbara Webb (*University of Edinburgh, UK*)
	10:30 – 12:30	**INVITED SYMPOSIUM 10 – INSIGHTS INTO THE FINE TUNING OF SOCIAL BEHAVIOR: THE BRAIN AS A SOURCE OF STEROID HORMONES** Chair: Laura Quintana Location: Auditorium 3
S10.1	**10:30–11:00**	**Neurosteroids and territorial aggression in a songbird** Kiran Soma (*University of British Columbia, Canada*)
S10.2	**11:00–11:30**	**Winter madness: The neuroendocrine regulation of seasonal aggression** Greg Demas (*Indiana University, USA*)
S10.3	**11:30–12:00**	**Role of neuroestrogens in the control of male sexual behavior** Charlotte Cornil (*University of Liège, Belgium*)
S10.4	**12:00–12:30**	**Neuroendocrine modulation of aggression: contributions from a wild electric fish** Laura Quintana (*Instituto de Investigaciones Biológicas Clemente Estable, Uruguay*)
	10:30 – 12:30	**INVITED SYMPOSIUM 11 – NEUROETHOLOGY OF 3D SPATIAL NAVIGATION** Chair: Michael Yartsev Location: Main Auditorium
S11.1	**10:30–11:00**	**Closed-loop neuroethology in freely foraging mouse lemurs** Daniel Huber (*University of Geneva, Switzerland*)
S11.2	**11:00–11:30**	**Environmental influences on the neural encoding of 3D space – insights from rats** Kate Jeffery (*University College London, UK*)
S11.3	**11:30–12:00**	**Representing space in marmoset hippocampus** Cory Miller (*University of California San Diego, USA*)

S11.4	**12:00–12:30**	**Neural representations across time and space in the hippocampus of freely flying bats** Michael Yartsev (*University of California Berkeley, USA*)
	10:30 – 12:30	**INVITED SYMPOSIUM 12 – SELECTIVE ATTENTION AND STATE-DEPENDENCY IN INVERTEBRATES** Chair: Vivek Nityananda Location: Room Foyer
S12.1	**10:30–11:00**	**Short-term water deprivation modulates hygrosensory and visually-evoked behaviors in flying flies** Sara Wasserman (*Wellesley College, USA*)
S12.2	**11:00–11:30**	**Muscles that move the retina augment compound-eye vision in *Drosophila*** Gaby Maimon (*Rockefeller University, USA*)
S12.3	**11:30–12:00**	**A role for active sleep in regulating selective attention and evolving consciousness** Bruno van Swinderen (*Queensland Brain Institute, Australia*)
S12.4	**12:00–12:30**	**Biophysics of mechanosensory perception is tuned both by internal behavioural states and external environmental states in crickets and spiders** Natasha Mhatre (*Western University, Canada*)
	12:30–14:00	**Lunch**
14:00 – 15:00		**PLENARY SESSION 7** **Visual world of flower foraging swallowtail butterflies** Michiyo Kinoshita (*SOKENDAI, Japan*) Chair: Uwe Homberg Location: Main Auditorium

15:00–15:30	**Coffee Break**
15:30–16:30	**WALTER HEILIGENBERG LECTURE** **The biased brain: How the owl knows what to rely on for sensory perception** José Luis Peña (*Albert Einstein College of Medicine, USA*) Chair: Cynthia Moss Location: Main Auditorium
16:30–19:30	**POSTER SESSION II** Location: Room 1 and Room 2 (Please see list of posters at the end section of this program)

FRIDAY, 29 JULY 2022

Main Venue: The Gulbenkian Foundation (Lisbon)

8:00–16:00 **Registration**
Location: Secretariat

9:00 – 10:00 **PLENARY SESSION 8**
Cellular, molecular, and physiological adaptations of hibernation
Elena Gracheva (*Yale, USA*)
Chair: Slav Bagriantsev
Location: Main Auditorium

10:00–10:30 **Coffee Break**

10:30–12:30 **PARTICIPANT SYMPOSIA 5–8**

10:30 – 12:15 **PARTICIPANT SYMPOSIUM 5 – MOTOR CONTROL II**
Chair: Claire Rusch
Location: Auditorium 2

T5.1 10:30–10:45 **Visual and antennal mechanosensory feedback affect head stabilization in hawkmoths**
Payel Chatterjee (*National Centre for Biological Sciences, India*)

T5.2 10:45–11:00 **Coordination and causal mechanisms for neural control of flight in a comprehensive hawkmoth motor program**
Leo Wood (*Georgia Institute of Technology, USA*)

T5.3 11:00–11:15 **Electrophysiological recordings in a running crab show the role of a lobula giant neuron in the speed control of the escape response to visual stimuli**
Alejandro Cámera (*IFIBYNE-UBA-CONICET, Argentina*)

T5.4	**11:15–11:30**	**A population of descending neurons mediating the optomotor response in flying *Drosophila*** Emily Palmer (*California Institute of Technology, USA*)
T5.5	**11:30–11:45**	**A model of harvester ant grasping behavior** Emily-Jane Rolley-Parnell (*University of Edinburgh, UK*)
T5.6	**11:45–12:00**	**Rapid color change for camouflage in two benthic predatory fishes** Leonie John (*University of Tübingen, Germany*)
T5.7	**12:00–12:15**	**Predictive saccades for decision making in saffron robber fly (*Laphria saffrana*), a beetle predator** Paloma T. Gonzalez-Bellido (*University of Minnesota, USA*)

10:30 – 12:00	**PARTICIPANT SYMPOSIUM 6 – ELECTROSENSORY SYSTEM, AUDITORY SYSTEM AND VOCAL COMMUNICATION** Chair: Jerome Beetz Location: Room Foyer

T6.1	**10:30–10:45**	**Deviance detection in auditory brainstem responses of bats** Johannes Wetekam (*Goethe University, Germany*)
T6.2	**10:45–11:00**	**Auditory responses of IC neurons in the big brown bat, *Eptesicus fuscus*, during a competitive foraging task** Angeles Salles (*Johns Hopkins University, USA*)
T6.3	**11:00–11:15**	**Investigating parallel song memory connections in the zebra finch higher auditory cortex** Sarah Morson (*Okinawa Institute of Science and Technology Graduate University, Japan*)
T6.4	**11:15–11:30**	**Exploring the role of egocentric movement for shape discrimination during active electrolocation in the weakly electric fish, *Gnathonemus petersii*** Sarah Skeels (*University of Oxford, UK*)
T6.5	**11:30–11:45**	**An electrosensory cocktail party problem** Alexandra Rudnaya (*Eberhard Karls University, Germany*)

T6.6 **11:45–12:00** **The electric ecology of predator-prey interactions: electroreception in caterpillars**
Sam J. England (*University of Bristol, UK*)

10:30 – 12:30 **PARTICIPANT SYMPOSIUM 7 – CHEMOSENSORY, MECHANOSENSORY AND HYGROSENSORY SYSTEM**
Chair: Alexandra Yarger
Location: Auditorium 3

T7.1 **10:30–10:45** **Investigating odor navigation in *Drosophila* using fictive odor landscapes**
Chad Morton (*The Rockefeller University, USA*)

T7.2 **10:45–11:00** **Chemical signatures of human odour and implications for mosquito olfactory evolution**
Jessica Zung (*Princeton University, USA*)

T7.3 **11:00–11:15** **Chemical cues mediate mound building behavior in termites**
Sree Subha Ramaswamy (*National Centre for Biological Sciences, India*)

T7.4 **11:15–11:30** **Floral humidity as an attractive signal in a nocturnal plant-pollinator interaction**
Ajinkya Dahake (*Cornell University, USA*)

T7.5 **11:30–11:45** **Mechanism of touch detection by sensory corpuscles in tactile specialist birds**
Slav Bagriantsev (*Yale University, USA*)

T7.6 **11:45–12:00** **Unraveling the sensory capabilities of scorpion pectines with a neuroanatomical and behavioural approach**
Torben Stemme (*Ulm University, Germany*)

T7.7 **12:00–12:15** **Temporal responses of bumblebee gustatory neurons encode sugar identity**
Rachel Parkinson (*University of Oxford, UK*)

T7.8 **12:15–12:30** **Neurobiological mechanisms underpinning behavioural responses to elevated CO_2 in a cephalopod**
Jodi Thomas (*ARC Centre of Excellence for Coral Reef Studies, Australia*)

	10:30 – 12:30	**PARTICIPANT SYMPOSIUM 8 – VISUAL SYSTEM II** Chair: Sajesh Vijayan Location: Main Auditorium
T8.1	**10:30–10:45**	**Short-term plasticity of the *Amphiprion ocellaris* visual system in response to anthropogenic changes to the light environment** Abigail Shaughnessy (*Queensland Brain Institute, Australia*)
T8.2	**10:45–11:00**	**Visually-guided proboscis movements fine-tune flower probing in the hummingbird hawkmoth** Anna Stöckl (*Würzburg University, Germany*)
T8.3	**11:00–11:15**	**The colourful retinal mosaic of nymphalid butterflies** Gregor Belusic (*University of Ljubljana, Slovenia*)
T8.4	**11:15–11:30**	**Persistent angular velocity bias after wide field visual motion presentation in flying *Drosophila*** Francesca Ponce (*Caltech, USA*)
T8.5	**11:30–11:45**	**Nocturnal flying insects are trapped by illumination due to their dorsal-light-response** Samuel Fabian (*Imperial College London, UK*)
T8.6	**11:45–12:00**	**Spatial resolution and optical sensitivity in the compound eyes of two common wasps, *Vespula germanica* and *Vespula vulgaris*** Daniel Gutierrez (*Lund University, Sweden*)
T8.7	**12:00–12:15**	**Parallel spatial processing in the hawkmoth visual system** Ronja Bigge (*University of Würzburg, Germany*)
T8.8	**12:15–12:30**	**Characterization of wide-field motion sensitive neurons in the central brain of the bumblebee** Bianca Jaske (*University of Würzburg, Germany*)
	12:30–14:00	**Lunch**

14:00 – 15:00		**PLENARY SESSION 9** **The gourmet fly: dissecting the mechanisms underlying feeding decisions** Carlos Ribeiro (*Champalimaud, Portugal*) Chair: Bruno van Swinderen Location: Main Auditorium
	15:00–15:30	**Coffee Break**
15:30–17:00		**CONCURRENT PARTICIPANT SYMPOSIA 9–12**
	15:30–17:00	**PARTICIPANT SYMPOSIUM 9 – SPATIAL ORIENTATION AND NAVIGATION II** Chair: Pauline Fleischmann Location: Auditorium 3
T9.1	**15:30–15:45**	**Source identity shapes spatial preference in primary auditory cortex during active navigation** Michael Pecka (*Ludwig-Maximilians Universität München, Germany*)
T9.2	**15:45–16:00**	**Neural representation of 3D space in the freely navigating goldfish by axial encoding schematics** Lear Cohen (*Ben Gurion University of the Negev, Israel*)
T9.3	**16:00–16:15**	**Screening for magnetically induced neuronal activity in the pigeon brain** Spencer Balay (*Research Institute of Molecular Pathology, Austria*)
T9.4	**16:15–16:30**	**Neuromorphic mushroom body model learning outdoor routes in real-time** Le Zhu (*University of Edinburgh, UK*)

T9.5	**16:30–16:45**	**From fish on dry land to new insights on navigation mechanisms in animals** Shachar Givon (*Ben Gurion University of the Negev, Israel*)
T9.6	**16:45–17:00**	**Magnetic pulses as a directional assay for studying magnetoreception in the Caribbean spiny lobster** Luke Havens (*University of North Carolina at Chapel Hill, USA*)
	15:30–17:00	**PARTICIPANT SYMPOSIUM 10 – COMMUNICATION, SOCIAL BEHAVIOR AND BRAIN** Chair: Manal Shakeel Location: Room Foyer
T10.1	**15:30–15:45**	**The neuroethology of vocal communication in zebra finches: Perception of an entire vocal repertoire.** Frederic Theunissen (*UC Berkeley, USA*)
T10.2	**15:45–16:00**	**Impact of informational masking on the acoustic communication of frogs** Saumya Gupta (*University of Minnesota, USA*)
T10.3	**16:00–16:15**	**Vision and vocal communication guide 3-D bird flock formation during flight** Susanne Hoffmann (*Max Planck Institute for Biological Intelligence (in foundation), Germany*)
T10.4	**16:15–16:30**	**Testing the social brain hypothesis in the wild: how increasing social complexity relates to behavioural repertoire size and neuroanatomy in the Lake Tanganyikan cichlid radiation** Etienne Lein (*Max Planck Institute of Animal Behavior, Germany*)
T10.5	**16:30–16:45**	**Neural codes for natural social behaviours in a bat colony** Saikat Ray (*Weizmann Institute of Science, Israel*)
T10.6	**16:45–17:00**	**Social modulation of the gut-brain axis in crayfish** Jens Herberholz (*University of Maryland, USA*)

	15:30–17:00	**PARTICIPANT SYMPOSIUM 11 – EVOLUTION AND DEVELOPMENT** Chair: Grace Capshaw Location: Room 2
T11.1	**15:30–15:45**	**Transition of neural activities during the development of *Ciona* swimming CPG** Madoka Utsumi (*Keio University, Japan*)
T11.2	**15:45–16:00**	**Complexity of social environment during development affects neural and social behaviour phenotypes in adult zebrafish** Magda Teles (*Instituto Gulbenkian de Ciência, Portugal*)
T11.3	**16:00–16:15**	**Dynamic evolution of diel activity patterns across over 400 million years of fish evolution** Maxwell Shafer (*University of Basel, Switzerland*)
T11.4	**16:15–16:30**	**Seeing the world in a new light: Fan worms travel a unique evolutionary path to vision** Michael Bok (*Lund University, Sweden*)
T11.5	**16:30–16:45**	**Function and evolution of high-resolution spatial vision in conch snails** Alison Irwin (*Natural History Museum, UK*)
T11.6	**16:45–17:00**	**Visual specialisation and explosive expansion of the mushroom bodies in *Helcionius butterflies*** Antoine Couto (*University of Bristol, UK*)
	15:30–17:00	**PARTICIPANT SYMPOSIUM 12 – LEARNING, MEMORY AND COGNITION II** Chair: Rickesh Patel Location: Auditorium 2
T12.1	**15:30–15:45**	**Neuronal activity of mushroom body extrinsic neurons during visual differential learning in honey bees** Benjamin Paffhausen (*CRCA, CNRS, France*)

T12.2	**15:45–16:00**	**Exploring the inter-individual variability in cognitive performance of honeybees** Valerie Finke (*CNRS/Université Toulouse, France*)
T12.3	**16:00–16:15**	**Unraveling the neurophysiological underpinnings of visual identity recognition in a paper wasp** Christopher Jernnigan (*Cornell University, USA*)
T12.4	**16:15–16:30**	**Olfactory learning and dopaminergic modulation in dipteran antennal lobes** Gabriella Wolff (*Case Western Reserve University, USA*)
T12.5	**16:30–16:45**	**Innate cognition: Nest building as an example of tool use in an African cichlid** Swantje Grätsch (*Max Planck Institute for Biological Intelligence, i.f., Germany*)
T12.6	**16:45–17:00**	**Bimodal sensory integration and learning in the vinegar fly *Drosophila melanogaster*** Devasena Thiagarajan (*Max Planck Institute for Chemical Ecology, Germany*)

17:00–18:00	**ISN BUSINESS MEETING** Location: Auditorium 2

18:00–19:00	**Free Time**

19:00–22:00	**BANQUET DINNER** Location: Casa do Alentejo (Lisboa)

POSTERS

POSTER SESSION I
(Monday, 15:00–18:00)

SPATIAL ORIENTATION AND NAVIGATION I

A1 **How the mushroom body and central complex contribute to visual homing in insects?**
Evripidis Gkanias (*University of Edinburgh, UK*)

A2 **Dynamic properties of compass neurons in the bumblebee brain**
Lisa Rother (*University of Würzburg, Germany*)

A3 **Natural switches in behavior rapidly modulate position by distance coding in hippocampal neurons**
Shaked Palgi (*Weizmann Institute of Science, Israel*)

A4 **Under the real sky: compass neuron responses**
Erich M. Staudacher (*Philipps-Universität Marburg, Germany*)

A5 **Neuronal control of turning behavior in freely flying flies**
Elhanan Ben Yishay (*The Max Planck Institute for Neurobiology of Behavior, Germany*)

A6 **Bumblebees dash through an artificial forest by combining different guiding mechanisms**
Manon Jeschke (*Bielefeld University, Germany*)

A7 **Homing of bees in cluttered environments**
Annkathrin Sonntag (*Bielefeld University, Germany*)

A8 **Characteristics of *Cataglyphis*' magnetic compass**
Valentin L. Müller (*University of Würzburg, Germany*)

A9 **Quantitative description of a flight trajectory by automated segmentation: example of moths in wind tunnel**
Matthieu Dacher (*Sorbonne Universite, France*)

A10 **A hypothesised network for communicating vector information in the honeybee waggle dance**
Anna Hadjitofi (*University of Edinburgh, UK*)

A11 **Decoding the ultimate compass: A neural substrate for multimodal cue integration in insect orientation**
Robert Mitchell (*University of Edinburgh, UK*)

A12 **Fragmented replay of very large environments in the hippocampus of bats**
Tamir Eliav (*Weizmann Institute of Science, Israel*)

A13 **An intrinsic oscillator underlies visual navigation in ants**
Antoine Wystrach (*CNRS/University of Toulouse Paul Sabatier, France*)

A14 **Specification of a goal direction by local neurons in the *Drosophila* fan-shaped body**
Aaron J. Lanz (*New York University Langone, USA*)

A15 **Object × position coding in the entorhinal cortex of flying bats**
Gily Ginosar (*Weizmann Institute of Science, Israel*)

A16 **Underlying mechanisms at play during learning flights**
Olivier Bertrand (*University Bielefeld, Germany*)

A17 **Hippocampal encoding of egocentric 3D target location in the echolocating big brown bat, *Eptesicus fuscus***
Xiaoyan Yin (*Johns Hopkins University, USA*)

A18 **Visual pursuit behavior in mice maintains the pursued prey on the retinal region with least optic flow**
Paul Stahr (*The Max Planck Institute for Neurobiology of Behavior, Germany*)

A19 **How has artificial selection changed olfactory bulb anatomy in the homing pigeon (*Columba livia*)?**
Kelsey Racicot (*University of Lethbridge, Canada*)

A20 **Selection for homing has driven an increase in hippocampal neuron numbers in the homing pigeon**
Audrey EM Guyonnnet (*University of Lethbridge, Canada*)

A21 **Do bumblebees rely on magnetoreception to perform a spatial memory task in the absence of visual and olfactory cues?**
Sara Bariselli (*Bangor University, UK*)

A22 **Odour disambiguates visual conflicts for homing bumblebees**
Sonja Eckel (*Bielefeld University, Germany*)

A23 **Learning and memory in desert ants: insights from fine-scale reconstructions of the entire foraging history of individual foragers**
Mike Mangan (*University of Sheffield, UK*)

MOTOR SYSTEMS, SENSORIMOTOR INTEGRATION, AND BEHAVIOR I

B1 **Stride-coupled modulations in *Drosophila* visual neurons guide rapid and flexible walking course control**
Terufumi Fujiwara (*Champalimaud Foundation, Portugal*)

B2 **Synaptic drive from central pattern generating networks to leg motor neurons differs between leg joints in an insect leg muscle control system**
Angelina Ruthe (*University of Cologne, Germany*)

B3 **Peripheral modulation of cardiac contractions in the American lobster, *Homarus americanus*, by the peptide myosuppressin is mediated by effects on the cardiac muscle itself**
Isabel Petropoulos (*Bowdoin College, USA*)

B4 **Modulation of feedback pathways in the cardiac neuromuscular system of the American lobster, *Homarus americanus***
Grant Griesman (*Bowdoin College, USA*)

B5 **Functional coupling of the mesencephalic locomotor region and V2a reticulospinal neurons driving forward locomotion**
Martin Carbo Tano (*Sorbonne Université, France*)

B6 **Recurrent inhibition in motor control**
Martina Radice (*FBMC, FCEN, UBA and IFIBYNE, UBA-CONICET, Argentina*)

B7 **Moving anchors: dynamics of ground reaction forces in freely behaving *Drosophila melanogaster* larvae revealed by deformable optical resonators**
Jonathan Booth (*University of St Andrews, UK*)

B8 **Sensorimotor apparatus underlying compensatory head-movements in hawkmoths**
Agnish Dev Prusty (*NCBS-TIFR Bangalore, India*)

B9 **Neural control of inter-limb coordination in an amphibious fish – the mudskipper**
Maximilian Bothe (*University of Graz, Austria*)

B10 **Respiratory brainstem structures mediating the mammalian diving reflex and learned breath holds**
Iris Bachmutsky (*University of California, USA*)

B11 **Actively frozen - Multiple immobility states revealed by novel patterns of leg muscle activity in *Drosophila melanogaster***
Anna Hobbiss (*Champalimaud Foundation, Portugal*)

EVOLUTION AND DEVELOPMENT I

C1 **The scorpion: A novel preparation for understanding the evolution and roles of the biogenic amines**
Karen Mesce (*University of Minnesota, USA*)

C2 **Plasticity in the visuo-motor system in embryonically generated monocular *Xenopus laevis***
Michael Forsthofer (*LMU Munich, Germany*)

C3 **Separate and distinct evolutionary paths to spatial vision in chitons**
Daniel Speiser (*University of South Carolina, USA*)

C4 **Evolution of vision in elephant fishes (*Mormyridae*) – why subtle differences matter**
Gina Sommer (*Charles University, Czech Republic*)

C5 **Evolutionary divergence of locomotion in two related vertebrate species**
Gokul Rajan (*Champalimaud Foundation, Portugal*)

C6 **Evolution of an olfactory subsystem and its link with the multiple emergences of eusociality in Hymenoptera**
Simon Marty (*EGCE, IDEEV (CNRS - Université Paris-Saclay), France*)

AUDITORY SYSTEM AND ACOUSTIC SIGNALING I

D1 **A comparison of patterns in dolphin whistles with human conversational structure**
Chiara Semenzin (*Ecole Normale Superieure, France*)

D2 **The bat cerebellum and its roles in vocalization and hearing**
Shivani Hariharan (*Johann Wolfgang Goethe Universität, Germany*)

D3 **Population coding of multi-wavefront echoes by the big brown bat inferior colliculus**
Kate Allen (*Johns Hopkins University, USA*)

D4 **Selective down-regulation of voltage-gated K+-channels in the naked-mole rat sound localization circuit**
Koch Ursula (*Freie Universität Berlin, Germany*)

D5 **Acoustic context modulates natural sound discrimination in auditory cortex through frequency-specific adaptation**
Luciana López-Jury (*Goethe Universität, Germany*)

D6 **Song duels adhere to context-dependent rules in nightingales**
Giacomo Costalunga (*Max Planck Institute for Biological Intelligence, Germany*)

D7 **Early-life stress affects Mongolian gerbil interactions with conspecific vocalizations in a sex-specific manner**
Kate Hardy (*Northeast Ohio Medical University, Kent State University, USA*)

D8 **Evaluating phonotaxis variability and selective processing of its underlying neural elements in an insect model**
Benjamin Navia (*Andrews University, USA*)

D9 **Cortical nucleus mMAN contributes to syllable sequencing in adult Bengalese finches (*Lonchura striata domestica*)**
Avani Koparkar (*University of Tuebingen, Germany*)

D10 **Filling in the gaps: auditory processing by descending neurons in a bush cricket**
Ali Cillov (*University of Göttingen, Germany*)

D11 **Dual region recordings in the sound localization pathway of barn owls to investigate stimulus selection of salient stimuli**
Andrea Bae (*Albert Einstein College of Medicine, USA*)

D12 **Structure and function of the cochlear nucleus of the naked mole-rat**
Joelle Jagersma (*University Medical Center Groningen, The Netherlands*)

D13 **Sound localization in chickens**
Gianmarco Maldarelli (*Technical University of Munich, Germany*)

D14 **Cricket singing behaviour – the role of abdominal ganglia**
Berthold Hedwig (*University of Cambridge, UK*)

D15 **Bats call anti-phase to rhythmic noise: dynamic time-domain jamming avoidance in freely socializing bats**
Ava Kiai (*Goethe University Frankfurt, Germany*)

D16 **Neural representation of conspecific communication sounds in the frontal auditory field of the Mexican free-tailed bat**
Silvio Macias (*Texas AM University, USA*)

D17 **Neural underpinnings of speciation by reinforcement in chorus frogs: the mystery of mismatch between temporal tuning and advertisement call structure in allopatric, but not sympatric populations**
Anwesha Mukhopadhyay (*University of Utah, USA*)

ELECTROSENSORY SYSTEM I

E1 **Electrocommunication and steroid hormone production vary with social context across electric knifefishes**
Megan K. Freiler (*Indiana University, USA*)

E2 **Activity patterns in a wild population of the electric fish *Apteronotus macrostomus* and *Eigenmannia sp*.**
Jacqueline Göbl (*Eberhard-Karls Universität Tübingen, Germany*)

E3 **Identifying stereotyped movement patterns during social interactions in weakly electric fish**
Keshav Ramachandra (*West Virginia University, USA*)

E4 **Characterization of the agonistic behavior of the weakly electric fish, *Gymnotus sylvius***
Rossana Perrone (*Instituto Clemente Estable/ Facultad de Psicología, Universidad de la República, Uruguay*)

E5 **Population coding of spatial information in the electrosensory system during social interactions**
Oak Milam (*West Virginia University, USA*)

E6 **Characterisation of a new class of aerial electroreceptor in bees**
Bethany Harris (*University of Bristol, UK*)

E7 **Sensing the electrical world: modelling electroreception in terrestrial Arthropods**
Ryan Palmer (*University of Bristol, UK*)

E8 **Electrocommunication signals motivation to continue mutual assessment in the electric fish *Apteronotus leptorhynchus***
Till Raab (*Eberhard Karls Universität Tübingen, Germany*)

E9 **Encoding of communication signals at high beat frequencies in the electrosensory system of *Apteronotus leptorhynchus***
Sina Prause (*University of Tübingen, Germany*)

E10 **Using an interactive biomimetic fish robot to investigate the role of electric signaling and locomotion during social interactions in groups of weakly electric fish**
Nils Weimar (*University of Bonn, Germany*)

E11 **Aerial electroreception and the electric landscape**
Liam J O'Reilly (*University of Bristol, UK*)

E12 **Weakly electric fish out of (swampy) water – how hypoxia and captivity effect brain cell proliferation and apoptosis in *Petrocephalus degeni***
Marie-Luise Vollbrecht (*Humboldt Universität Berlin, Germany*)

E13 **An internal model of sensorimotor context in freely swimming electric fish**
Avner Wallach (*Columbia University, USA*)

SOCIAL BEHAVIOR AND NEUROMODULATION I

F1 **Interaction between arginine vasotocin and gonadal hormones in the regulation of reproductive behavior in a cichlid fish**
Ana S. Félix (*ISPA & Instituto Gulbenkian de Ciência, Portugal*)

F2 **Oxytocin modulation of socially driven adult neurogenesis in zebrafish**
Bianca Fusani (*ISPA & Instituto Gulbenkian de Ciência, Portugal*)

F3 **Principles underlying information flow across the entire brain of the zebrafish**
Emiliano Marachlian (*IBENS, France*)

F4 **Social modulation of neuronal complexity in zebrafish**
Rita Gageiro (*Instituto Gulbenkian de Ciência, Portugal*)

F5 **Organization of a layered structure in the dorsal telencephalon of gobies**
Ruth Gutjahr (*University of Graz, Austria*)

F6 **Biophysical properties and gene expression profile of single periaqueductal gray neurons in the mouse brain**
Oriol Pavon Arocas (*University College London, UK*)

F7 **Exploring density dependent locust marching with immersive virtual reality**
Sercan Sayin (*University of Konstanz, Germany*)

F8 **Behavior and neurobiology of attaining social status in cichlids**
Robert Mobley (*Lousiana State University, USA*)

F9 **The role of the fish amygdala in visually-driven aggressive behavior of Siamese fighting fish**
Claire Everett (*Columbia University, USA*)

F10 **In sync for infants: Behavioral and hormonal signatures of care in biparental poison frogs**
Billie Goolsby (*Stanford University, USA*)

F11 **Combinatorial logic of neuromodulatory systems in the zebrafish telencephalon**
Lukas Anneser (*Friedrich Miescher Institute for Biomedical Research, Switzerland*)

F12 **Sex steroids regulating year-round aggression: the role of neurosteroids across sex and seasons**
Guillermo Valiño (*Instituto de Investigaciones Biológicas Clemente Estable, Uruguay*)

F13 **Understanding the control of mouthbrooding behaviour in the African cichlid *Astatotilapia burtoni***
Gonçalo Igreja André (*University of Maryland, USA*)

F14 **Differences in brain activation patters between populations artificially selected for sociality in zebrafish (*Danio rerio*)**
Pedro Rego (*Instituto Gulbenkian de Ciência, Portugal*)

F15 **Social communication signals in synodontid catfish, social preferences and neural correlates**
Carlos Daniel Corrales Parada (*University of Graz, Austria*)

F16 **Context-dependency of social affiliation in zebrafish**
Lukas Breitzler (*Max Planck Institute of Biological Intelligence (in foundation), Germany*)

F17 **South American annual fish *Austrolebias reicherti* increase motivation to court and fight as lifespan elapses. Differential responses to stress across the season?**
Federico Reyes (*Universidad de la República, Uruguay*)

F18 **Dark/light preference as a measure of stress and anxiety in fighter and wild-type strains of the siamese fighting fish *Betta splendens***
Deepa Alex (*University of Saint Joseph, China*)

CHEMICAL SENSING I

G1 **Olfactory gating of visual preferences in *Aedes aegypti***
Claire Rusch (*Champalimaud Foundation, Portugal*)

G2 **Functional and developmental analyses of the sex pheromone reception system in the American cockroach during the nymphal-adult transition**
Kosuke Tateishi (*Fukuoka University, Japan*)

G3 **Ants act as olfactory bio-detectors of tumour in patient-derived xenograft mice**
Patrizia D'Ettorre (*University Sorbonne Paris Nord, France*)

G4 **Neurophysiological correlates of alcohol tolerance in the mushroom body of *Drosophila melanogaster***
Nicolás Leonardo Fuenzalida (*Universidad de Puerto Rico, Puerto Rico*)

G5 **Two metres as the mosquito flies – The role of a select odorant receptor regulating the onset of host seeking in the malaria mosquito *Anopheles gambiae***
Annika Hinze (*Swedish University of Agricultural Sciences, Sweden*)

G6 **Optimized functional imaging of mosquito olfactory sensory neuron activity**
Diego Giraldo (*Johns Hopkins University, USA*)

G7 **Honey bees' olfactory discriminative abilities rely on a community of gut bacteria**
Amélie Cabirol (*University of Lausanne, Switzerland*)

G8 **Neuronal processing of trail pheromone communication in the ant *Crematogaster scutellaris***
Florencia Scarano (*University of Trento, Italy*)

G9 **Alarm! - modulatory effects of Schreckstoff on the startle escape response of goldfish (*Carassius auratus*)**
Denis Shor (*CUNY Graduate Center, USA*)

MECHANOSENSATION, ANEMOSENSATION, THERMORECEPTION, HYGRORECEPTION AND NOCICEPTION

H1 **Uncovering the molecular mechanisms of rapid experience-dependent thermosensory adaptation in *C. elegans***
Tyler Hill (*Brandeis University, USA*)

H2 **Characterization of the humidity receptor neurons in *Drosophila melanogaster***
Kristina Corthals (*Lund University, Sweden*)

H3 **Cephalic mechanosensors and their role in initiation of flight related reflexes**
Maitri Manjunath (*National Centre for Biological Sciences, India*)

H4 **Characterization of a leg mechanosensor in the Oleander hawkmoth**
Simran Virdi (*National Centre for Biological Sciences, India*)

H5 **Suppression of host nocifensive behavior by parasitoid wasp venom**
Amit Rana (*Ben-Gurion University of the Negev, Israel*)

H6 **The antennae as wind detectors during straight-line orientation in dung beetles**
Shahrzad Shaverdian (*Lund University, Sweden*)

H7 **Active anemosensing: How insects could estimate wind direction through sensory integration**
Floris van Breugel (*University of Nevada, USA*)

VISION AND PHOTORECEPTION I

I1 **Functional evidence of the role of the crab lobula plate as optic flow processing center**
Yair Barnatan (*IFIBYNE-CONICET-UBA, Argentina*)

I2 **Population coding of visual information and control of avoidance behaviours in locusts**
Sinan Zhang (*University of Saskatchewan, Canada*)

I3 **Investigating the synaptic connections in the lamina of the praying mantis *Tenodera sinensis***
Stefan Wernitznig (*Medical University of Graz, Austria*)

I4 **The spectral organization of the retina and lamina of the butterfly, *Papilio xuthus*, with the animals' best color vision**
Kentaro Arikawa (*SOKENDAI, Japan*)

I5 **Mixes and matches of visual pigments: fascinating innovations of the snake visual system**
Einat Hauzman (*Natural History Museum, UK*)

I6 **How does the common barbel (*Barbus barbus*) see? The effect of the whole-genome duplication on vision**
Zuzana Konvicková (*Charles University, Czech Republic*)

I7 **A model of a locust looming detection circuit incorporating global, lateral and feedforward inhibition**
Erik Olson (*University of Saskatchewan, Canada*)

I8 **Regional specialization to see polarization: a dorsal rim in mantis shrimp?**
Katelynn Csanadi-Schwartz (*University of Maryland Baltimore County, USA*)

I9 **Synchrotron source micro-x-ray computed tomography for examining *Lepidoptera* eyes**
Dawn Paukner (*University of Chicago and Argonne National Laboratory, USA*)

I10 **Visual physiology and behavior of larval stomatopod crustaceans**
Marisa McDonald (*University of Hawai'i at Manoa, USA*)

I11 **Stereopsis in a miniature world: modeling the potential for stereopsis in hunting spiders**
Deniz Korman (*University of Cincinnati, USA*)

I12 **Performance of apposition compound eyes in the deep sea – a computational model**
Zahra Bagheri (*University of Western Australia, Australia*)

I13 **Multiple mechanisms mediate the suppression of motion vision during escape maneuvers in flying *Drosophila***
Philippe Fischer (*MPI Neurobiology of Behavior, Germany*)

I14 **Are Lithops "stone" plants? Quantifying chroma and luminance match to rock and soil backgrounds**
Andre Scheepers (*Lund University, Sweden*)

I15 **Colour vision in the dark: retinal computations underlying chromatic discrimination in low illumination**
Carola Yovanovich (*University of Sussex, UK*)

I16 **Vision in sturgeons: evolution of the opsin genes and how to see without rod cells in retina**
Prokop Košátko (*Charles University, Czech Republic*)

I17 **Spectral and polarisation information processing in the stomatopod visual system**
Judy Ching-Wen Wang (*University of Queensland, Australia*)

I18 **CRISPR/Cas9-mediated knockout of *Amlop1* opsin reduces color learning efficiency of honeybees in a passive-avoidance task**
Haiyang Geng (*University Paul Sabatier, France*)

I19 **Damsels in colour: adaptations of the visual system and colouration during the development of coral reef damselfishes (*Pomacentridae*)**
Valerio Tettamanti (*Queensland Brain Institute, Australia*)

I20 **The retinal basis of vision at the origin of vertebrate life**
George Kafetzis (*University of Sussex, UK*)

I21 **Opsin repertoire and light-mediated behaviors of the starlet sea anemone, *Nematostella vectensis***
Kyle McCulloch (*University of Minnesota, USA*)

I22 **Chromatic motion sensitive neuron in the yellow Japanese swallowtail butterfly**
Clément Céchetto (*SOKENDAI, Japan*)

LEARNING, MEMORY AND COGNITION I

J1 **State-dependent judgement biases in bees demonstrated using an active choice task**
Olga Procenko (*Newcastle University, UK*)

J2 **Mushroom body output population activity allows for odor-cued behavioral prediction**
Cansu Arican (*University of Cologne, Germany*)

J3 **Multimodal learning modulation by biogenic amines in bumblebees (*Bombus impatiens*)**
Oswaldo Gil-Guevara (*Universidad del Rosario, Colombia*)

J4 **Musicality influences active sensing behavior in a freely-moving frequency discrimination task**
Dardo N Ferreiro (*Ludwig Maximilian University of Munich, Germany*)

J5 **Female brain molecules orchestrate mate memory to avoid cheater males**
Sagrario Cordero-Molina (*Universidad Nacional Autónoma de México, Mexico*)

J6 **Neuro-morphology and molecular changes of sex pheromone learning in butterflies**
Emilie Dion (*National University of Singapore, Singapore*)

J7 **Morphological differences and task specialisation: do polymorphic ant workers differ in nestmate recognition abilities?**
Erika H Dawson (*Université Sorbonne Paris Nord, France*)

J8 **Investigating visual coding and memory in the honey bee brain**
Marco Paoli (*CRCA, CBI, CNRS, France*)

J9 **Neural signature of visual learning under virtual-reality conditions in the honey bee**
Grégory Lafon (*CBI – CRCA, France*)

J10 **Charactering the roles of neuropeptides in non-associative learning**
Catharine Rankin (*University of British Columbia, Canada*)

J11 **Deconstructing collective cognition in *Drosophila*: neurobehavioural mechanisms of social and asocial learning**
Rúben F. Correia (*Instituto Gulbenkian de Ciência, Portugal*)

J12 **Information integration for nutritional decision-making in desert locusts**
Yannick Günzel (*University of Konstanz, Germany*)

J13 **Judgment bias influences the neurobiological control of behaviour**
Maria Victoria Alvarado (*Instituto Gulbenkian de Ciência, Portugal*)

J14 **Protection of bumble bees using phytochemicals against impairments induced by the neuropesticide fipronil**
Lina M. Garcia (*Universidad del Rosario, Colombia*)

J15 **Looking for immediate early genes as neuronal activation markers in the cephalopod mollusc *Sepia officinalis***
Lisa Poncet (*University of Caen Normandie, France*)

METABOLISM, BIOLOGICAL RHYTHMS AND HOMEOSTASIS I

K1 **Dietary effects on the activity of insulin producing cells in *Drosophila***
Rituja Bisen (*Julius Maximilian Universität, Germany*)

K2 **Behavioral state-dependent modulation of insulin-producing cells in *Drosophila***
Sander Liessem (*Julius-Maximilians-Universität of Würzburg, Germany*)

K3 **Neural circuits and neuromodulators that influence waking arousal in zebrafish**
Jennifer M. Panlilio (*NICHD/NIH, USA*)

K4 **Sex differences in circadian clock neuron network resilience in *Drosophila melanogaster***
Maria de la Paz Fernandez (*Barnard College of Columbia University, USA*)

K5 **Effect of dietary P:C ratio and amino acid ingestion in *Crematogaster scutellaris* ant behaviour**
Sara Arganda (*Universidad Rey Juan Carlos, Spain*)

K6 **Cellular and molecular underpinnings of hibernation anorexia**
Sarah Mohr (*Yale University, USA*)

POSTER SESSION II
(Thursday, 16:30–19:30)

SPATIAL ORIENTATION AND NAVIGATION II

A24 **Representation of visual landmarks in mouse primary visual cortex during navigation in virtual reality**
Mai Morimoto (*University College London, UK*)

A25 **Odor plume navigation in the *Drosophila* central complex**
Nicholas Kathman (*NYU Langone Medical Center, USA*)

A26 **Oriented evening flight behaviour in the Bogong moth revealed through automated video tracking**
Jesse Wallace (*Australian National University and Lund University, Australia*)

A27 **Spatial representation in the hippocampal formation of barn owls with multiple flight goals**
Arpit Agarwal (*The Technion, Israel*)

A28 **Methods for the study of orientation and navigation in migratory bats**
Oliver Lindecke (*Carl von Ossietzky University of Oldenburg, Germany*)

A29 **Modeling multiple context-specific vector memory in the insect central complex**
Roman Goulard (*Lund Universitet, UK*)

A30 **Harmonic radar tracking reveals unexpected effects of streetlights on moth orientation**
Jacqueline Degen (*University of Würzburg, Germany*)

A31 **A brainstem integrator for self-location memory and positional homeostasis**
En Yang (*Howard Hughes Medical Institute Janelia Research Campus, USA*)

A32 **Bumblebees navigate with vectors recalled from long term memory**
Rickesh Patel (*Lund University, Sweden*)

A33 **Ups and downs to visually gauge the flight distance**
Lucia Bergantin (*Aix-Marseille Université, CNRS, ISM, France*)

A34 **Learning flights in bumblebees**
Natalie Hempel de Ibarra (*University of Exeter, UK*)

A35 **What are the rules of spatial learning? Insights from ant navigators**
Léo Clement (*CNRS, Université Paul Sabatier, France*)

A36 **Neural representation of head-direction across brain areas in quails-**
Shaked Ron (*Technion, Israel*)

A37 **Finding the upper bound of disruptive radio frequencies disrupting avian magnetoreception with behavioural experiments**
Bo Leberecht (*Institute of Biology and Environmental Sciences, Carl von Ossietzky University Oldenburg, Germany*)

A38 **The head direction circuit of ants and bees**
Stanley Heinze (*Lund University, Sweden*)

A39 **Neural circuit dynamics for navigation and sleep observed over multiple days in behaving fruit flies**
Andres Flores-Valle (*Max Plank Institute for Neurobiology of Behavior-caesar, Germany*)

A40 **Conserved parallel input pathways to the noduli across hymenopteran insects**
Valentin Gillet (*Lund University, Sweden*)

A41 **Cross-species comparison of mammalian spatial planning using naturalistic predator-prey interactions**
Alexander Lai (*Northwestern University, USA*)

A42 **Comparison of motivational dynamics of local search behaviour and honey bee dance**
Manal Shakeel (*National Centre for Biological Sciences, India*)

A43 **Tracking the orientation and 3d path of flying insects**
Michael Thomas Smith (*University of Sheffield, UK*)

A44 **Too cool to remember**
Ioannis Pisokas (*University of Edinburgh, UK*)

A45 **An unusual lateral protocerebrum in larval mantis shrimps**
Alice Chou (*Brandeis University, USA*)

A46 **Modelling gap choice through cluttered environments in pigeons**
Natalia Perez-Campanero (*University of Oxford, UK*)

MOTOR SYSTEMS, SENSORIMOTOR INTEGRATION, AND BEHAVIOR II

B12 **Tardigaits: coordination and neuromodulation of tardigrade locomotion**
Gal Haspel (*New Jersey Institute of Technology, USA*)

B13 **Sublethal effects of the pesticide Flupyradifurone on locomotion and behavior of *Chrysoperla carnea* larvae**
Leonie Scheibli (*Ulm University, Institute of Neurobiology, Germany*)

B14 **Proprioceptive body-state feedback modulates visual object tracking in *D. melanogaster* flight**
Martha Rimniceanu (*University of California Los Angeles, USA*)

B15 **The multiple locomotion gaits of the mole cricket**
Amir Ayali (*Tel Aviv University, Israel*)

B16 **Escape behavior in zebra finches (*Taeniopygia guttata*) and the role of the isthmotectal system**
Gonzalo Marín (University of Chile, Chile)

B17 **Facial movements and their neural correlates reveal latent decision variables in mice**
Fanny Cazettes (*Champalimaud Foundation, Portugal*)

B18 **Threat history controls escape behaviour in mice**
Stephen C. Lenzi (*Sainsbury Wellcome Centre for Neural Circuits and Behaviour, UK*)

B19 **Blink and you'll miss it: ballistic predatory behavior in the ogre-faced spider**
Jay Stafstrom (*Cornell University, USA*)

B20 **A comparative analysis of vestibular-motor behaviors in bats and mice: insights into species-specific sensorimotor functions in the mammalian brain**
Hui Ho Vanessa Chang (*McGill University, Canada*)

B21 **Integration rules for multisensory control of wing and gaze revealed by direct haltere manipulation**
Michael Rauscher (*Case Western Reserve University, USA*)

B22 **Mapping the sensorimotor connectome underlying protein-specific appetites in *Drosophila melanogaster***
Ibrahim Tastekin (*Champalimaud Foundation, Portugal*)

B23 **Visuo-motor control of locomotion in navigating ants**
Océane Dauzere-Peres (*CNRS/University of Toulouse Paul Sabatier, France*)

EVOLUTION AND DEVELOPMENT II

C7 **Social brain evolution of halitid bees**
Marc Seid (*University of Scranton, USA*)

C8 **Evolution of the olfactory circuits driving human host preference in mosquitoes**
Lukas Weiss (*Princeton University, USA*)

C9 **EyeVolve, a modular PYTHON-based model for simulating eye type diversification**
Elke Buschbeck (*University of Cincinnati, USA*)

C10 **Opsin evolution in jumping spiders**
Megan Porter (*University of Hawaii at Manoa, USA*)

C11 **The Gluopsins: opsins without the retinal binding lysine**
Martin Gühmann (*University of Bristol, UK*)

C12 **Cellular Scaling Rules for Amphibian Brains**
Yicheng Zhang (*Charles University in Prague, Czech Republic*)

AUDITORY SYSTEM AND ACOUSTIC SIGNALING II

D18 **The effects of multi-modal noise on conspecific call perception in the field cricket, *Teleogryllus commodus***
Jessica Briggs (*University of New Hampshire, USA*)

D19 **Properties and variability in social acoustic communication of bottlenose dolphins**
Faadil Mustun (*IBENS, France*)

D20 **Study of bottlenose dolphin (*Tursiops truncatus*) acoustic communication during human-dolphin interaction using AI methods-**
Anita Paparelli (*Institut de Biologie de l'École Normale Supérieure IBENS, France*)

D21 **The cortico-collicular axis and its role in sensory processing during vocalization**
Celine Bialek (*Goethe University, Germany*)

D22 **The effect of encoding sensory cue reliability on the function and development of the barn owl auditory system and sound localizing behavior**
Keanu Shadron (*Albert Einstein College of Medicine, USA*)

D23 **Temporal and social dynamics modulate the vocal repertoire of *Boana pulchellus***
Mariana Rodriguez-Santiago (*Colorado State University, USA*)

D24 **Visualization of grasp space and attention transitions in bats using echo reconstruction with acoustic simulation**
Yu Teshima (*Doshisha University, Japan*)

D25 **Real-time whistle pitch-matching in wild nightingales**
Daniela Vallentin (*Max Planck Institute for Ornithology, Germany*)

D26 **Lack of *Fmr1*-gene impacts early development of vocal communication particularly in female mouse pups**
Thorsten Becker (*Freie Universitaet Berlin, Germany*)

D27 **The role of motor cortex for the production of communication calls in the Egyptian fruit-bat**
Elie Julie (*University of California Berkeley, USA*)

D28 **Echolocation reverses information flow in a cortical vocalization network**
Julio Hechavarria (*Goethe University, Frankfurt am Main/ Institute for Cell Biology and Neuroscience, Germany*)

D29 **Temporal coordination of *Danionella c.* vocalisations**
Maximilian Hoffmann (*Einstein Center for Neuroscience, NeuroCure Cluster of Excellence, Charité Universitätsmedizin Berl, Germany*)

D30 **The neural basis of spectral prosody in avian vocal duets**
Alena Lemazina (*Max Plank Institute for Ornithology, Germany*)

D31 ***Danionella cerebrum* as a novel model system to investigate acoustic signaling and noise-coping mechanisms in vertebrates**
Andre Matos (*University of Saint Joseph, China*)

D32 **Stimulus-specific adaptation in the bat's frontal and auditory cortex**
Eugenia Gonzalez Palomares (*Goethe University Frankfurt am Main, Germany*)

D33 **Brain-wide mapping of auditory-evoked responses in *Danionella***
Joerg Henninger (*Einstein Center for Neuroscience, NeuroCure Cluster of Excellence, Charité Universitätsmedizin Berl, Germany*)

D34 **Auditory mechanics and morphometry of an insect's tracheal vesicles**
Brendan Latham (*University of Strathclyde, UK*)

D35 **Acoustic communication in early cretaceous crickets**
Harald Wolf (*University of Ulm, Germany*)

D36 **Conserved vocal central pattern generator in genus *Xenopus***
Ayako Yamaguchi (U*niversity of Utah, USA*)

D37 **Does male size really matter? – A study on correlations between calling song frequency and body size parameters within and across cricket populations**
Marcelo Christian (*Friedrich-Schiller-University Jena, Germany*)

ELECTROSENSORY SYSTEM II

E14 **Complex frequency modulations in freely interacting electric fish, *Apteronotus leptorhynchus*, recorded in their natural habitat**
Patrick Weygoldt (*Eberhard Karls Universität Tübingen, Germany*)

E15 **Magnocellular mesencephalic nucleus in *Apteronotus albifrons***
Masashi Kawasaki (*University of Virginia, USA*)

E16 **Object size and distance discrimination strategies in *Gnathonemus petersii***
Maria Paula Arteaga Avendaño (*Universität Bielefeld, Germany*)

E17 **Is melatonin enough? Central and peripheral actions of melatonin on the electric behavior of *Brachyhypopomus gauderio***
Adriana Migliaro (*Facultad de Ciencias, Uruguay*)

E18 **Optimal electrosensing in mormyrid electric fish**
Denis Turcu (*Columbia University, USA*)

E19 **A spark in the dark - activity rhythms of African weakly electric fish**
Stefan Mucha (*Humboldt-Universität zu Berlin, Germany*)

E20 **A bespoke and affordable methodology for characterising the electrical environment**
Konstantine Manser (*University of Bristol, UK*)

E21 **Extremely high numbers of brain neurons in weakly electric fish**
Pavel Nemec (*Charles University, Czech Republic*)

E22 **Neuronal noise and heterogeneity increase the dynamic range for encoding electrosensory stimuli**
Ibrahim Tunc (*Eberhard Karls Universität Tübingen Institute for Neurobiology, Germany*)

E23 **Descending pathways promote neural response heterogeneities to behaviorally relevant stimuli**
Michael G Metzen (*McGill University, Canada*)

E24 **Receptive field sizes and neuronal encoding bandwidth are constrained by axonal conduction delays**
Jan Grewe (*University of Tuebingen, Germany*)

E25 **Serotonergic modulation of population coding**
Mariana Marquez Machorro (*McGill University, Canada*)

SOCIAL BEHAVIOR AND NEUROMODULATION II

F19 **Neurogenomic response to aggression in females of the Siamese fighting fish**
Sara Cardoso (*University of Saint Joseph, China*)

F20 **Probing the neurobiological basis of sex differences in visually-evoked aggression in the Siamese fighting fish *Betta splendens***
Amy Norovich (*Columbia University, USA*)

F21 **Dynamics of the steroid response to an aggressive challenge in a wild-type and fighter-selected strain of *Betta splendens***
Andreia Ramos (*University of Saint Joseph, China*)

F22 **To flex or flee: Investigating defense behavior and its neural control during symbiotic interactions in rove beetles**
Jessleen Kanwal (*California Institute of Technology, USA*)

F23 **Neural correlates of natural social behavior in freely-moving macaques-**
Camille Testard (*University of Pennsylvania, USA*)

F24 **Pre-copulatory reproductive behaviours are preserved in *Drosophila melanogaster* infected with bacteria**
Carolina Rezaval (*University of Birmingham, UK*)

F25 **Ethogram of mouse sexual behavior**
Oihane Horno (*Champalimaud Foundation, Portugal*)

F26 **Anatomical and electrophysiological characterization of hypothalamic neurons involved in female sexual behavior**
Inês C. Dias (*Champalimaud Foundation, Portugal*)

F27 **Should I mate or should I reject? A novel role for the anterior VMHvl in the cyclical control of female rejection behavior**
Basma F.A. Husain (*Champalimaud Foundation, Portugal*)

F28 **Neural mechanisms of juvenile aggression**
Jordan McKinney (*Stanford University, USA*)

F29 **Fear contagion in fish: the role of oxytocin and the orthologous autism gene *Shank3***
Kyriacos Kareklas (*Instituto Gulbenkian de Ciência, Portugal*)

F30 **Serotonin receptors 5HT1A and 5HT3 function in territorial and paternal behaviors: Utilizing organismal pharmacological methods to ascertain behavioral functions**
Gary Ten Eyck (*New York University, USA*)

F31 **Transcriptomic profiling of brood care behaviour in the shell-dwelling cichlid *L. Ocellatus***
Manuel Stemmer (*Max Planck Institute for Biological Intelligence, i.f, Germany*)

F32 **Development of social cognition in cichlids: do offspring respond to parental cues?**
Ash Parker (*Max Planck Institute for Biological Intelligence, i.f, Germany*)

F33 **Does enrichment of the breeding environment have an impact on the emotional state of the common cuttlefish *Sepia officinalis*?**
Manon Peyrafort (*Université de Caen Normandie, France*)

F34 **Individual consistency in the stinging behaviour of honeybees**
Kavitha Kannan (*University of Konstanz, Germany*)

F35 **Innate behaviors change with ambient light in old and new-world mice**
Katja Reinhard (*Neuro-Electronics Research Flanders (NERF), Belgium*)

F36 **Hypothalamic galanin neurons modulate stress in zebrafish larvae**
Laura Corradi (*MDC Berlin, Germany*)

CHEMICAL SENSING II

G10 **Mating induced attraction to oviposition-related odors in the yellow fever mosquito *Aedes aegypti***
Margot Wohl (*Johns Hopkins Bloomberg School of Public Health, USA*)

G11 **Chemosensory responses in larval malaria mosquitoes**
Orsolya Fölsz (*Durham University, Hungary*)

G12 **Olfactory cues and experience dependent preferences guide foraging behavior in leaf cutting ants *Acromyrmex ambiguous***
Ayelén Nally (*Universidad de Buenos Aires, Argentina*)

G13 **A dual role for prostaglandin F signaling in hormonal and pheromonal signaling in cichlid fish**
Scott Juntti (*University of Maryland, USA*)

G14 **A simple method for odor discrimination using an isolated locust antenna**
Neta Shvil (*Tel-Aviv University, Israel*)

G15 **Functional study of the queen pheromone receptor OR11 in honey bees (within the genus *Apis*)**
Julia Mariette (*EGCE, CNRS, France*)

G16 **Functional significance of increased olfactory sensory pooling in a drosophilid specialist**
Suguru Takagi (*University of Lausanne, Switzerland*)

G17 **Compounds without borders: a novel paradigm for quantifying complex odors and responses to scent-pollution in bumblebees**
Jordanna Sprayberry (*Muhlenberg College, USA*)

G18 **Social modulation of food odorant processing in the locust antennal lobe**
Petelski Inga (*University Konstanz, Germany*)

VISION AND PHOTORECEPTION II

I23 **Retinal mosaic contribution to spatial and spectral interactions among photoreceptor axons in the lamina of *Papilio Xuthus***
Marko Ilic (*University of Ljubljana, Slovenia*)

I24 **Adaptions of the peripheral visual system to dim light in hawkmoths (*Sphingidae*)**
Natalie Roberts (*Lund University, Sweden*)

I25 **Here comes the Sun: Effects of abrupt and gradual changes in light intensity over a 24h period in a nocturnal ground beetle**
Mikkel Roald-Arboel (*University of Sussex, UK*)

I26 **Prey capture and escape behaviors of male and female Neohelice crabs to moving objects are differentially affected by the level of starvation**
Daniel Tomsic (*Universidad de Buenos Aires-IFIBYNE CONICET, Argentina*)

I27 **Kinetically matched head and eye rotations are synchronized to stabilize visual scene in freely moving mammals**
Damian Wallace (*Max Planck Institute for Neurobiology of Behavior*)

I28 **CompoundRay: simulating insect vision accurately and fast**
Blayze Millward (*The University of Sheffield, UK*)

I29 **The neuroethology of distributed vision in chitons and scallops**
Daniel Chappell (*Air Force Research Lab, USA*)

I30 **Vision in drosophilids from disparate visual landscapes**
Jamie Theobald (*Florida International University, USA*)

I31 **Development of the binocular visual field in a diurnal precocial rodent, the *Octodon degus***
Alfonso Deichler (*Universidad de Chile, Chile*)

I32 **Resplendent reflections: Mueller matrix characterizations of circularly polarized reflectance from jewel scarabs**
Laura Bagge (*Air Force Research Laboratory, Torch Technologies, USA*)

I33 **Connectivity in the optic lamina of two stomatopod superfamilies**
Amy Streets (*University of Queensland, Australia*)

I34 **Spectral sensitivity and chromatic vision of Australian jewel beetles**
Amanda Franklin (*University of Melbourne, Australia*)

I35 **Trichromatic retina is highly conserved among tortricid moths**
Alejandro Martín (*University of Lleida, Spain*)

I36 **Temporally-linked visual recognition in insects**
Alkhoury Maroun Rana (*The University of Edinburgh, UK*)

I37 **What a bird's eye tells a bird's brain**
Marvin Seifert (*University of Sussex, UK*)

I38 **Rapid adaptation to new light environments mediated by photoreceptor outer segment plasticity in the developing retina of Atlantic halibut (*Hippoglossus hippoglossus*)**
Kennedy Bolstad (*Simon Fraser University, Canada*)

I39 **Contrast-polarity specific mapping optimizes neuronal computation for collision detection**
Richard Dewell (*Baylor College of Medicine, USA*)

I40 **Extra-ocular camouflage of flatfish**
Lisa Grebinsky (*Simon Fraser University, Canada*)

I41 **Defensive shimmering responses in the Asian giant honeybee Apis dorsata are triggered by dark stimuli moving against a bright background**
Sajesh Vijayan (*Indian Institute of Science Education and Research Thiruvananthapuram, India*)

I42 **Visually guided approach and reaching in the Hummingbird Hawkmoth**
Aruna Raman (*University of Edinburgh, UK*)

LEARNING, MEMORY AND COGNITION II

J16 **Improved learning and memory retention performance in honeybees using bimodal versus unimodal stimuli, and the future use of multimodality in electroreception research**
Fraser Woodburn (*University of Bristol, UK*)

J17 **Has artificial selection for shoal preference in zebrafish driven the evolution of enhanced cognition?**
Rafael Infantes (*Instituto Gulbenkian de Ciência, Portugal*)

J18 **How the fly decides: behavioral, genetic, and neuronal analysis of action selection**
Carla Ladd (*University of California, USA*)

J19 **Identifying natural transitions from goal-directed to habit-like performance during sensorimotor learning in mice**
Sharlen Moore (*Johns Hopkins University, USA*)

J20 **Does the memory of a food source location can be modulated by the presence of a pheromone trail?**
Maria Eugenia Villar (*Universidad Rey Juan Carlos, Spain*)

J21 **Hierarchical architecture of dopaminergic circuits enables second-order conditioning in *Drosophila***
Toshihide Hige (*University of North Carolina at Chapel Hill, USA*)

J22 **Odd and even number categorisation by an insect and simple artificial neural network**
Scarlett Howard (*Monash University, Australia*)

J23 **Number neurons in the nidopallium of young domestic chicks**
Dmitry Kobylkov (*University of Trento, Italy*)

J24 **Flexible recruitment during honeybee colony defence**
Morgane Nouvian (*University of Konstanz, Germany*)

J25 **Genetic architecture of social and asocial learning in *Drosophila melanogaster***
Carla Simões Henriques (*Instituto Gulbenkian de Ciência, Portugal*)

J26 **DnaJ/Hsp40 tunes long-term memory and functional amyloidogenesis**
Kyle Patton (*Stowers Institute, USA*)

J27 **Feels like home: influence of size and chemosensory cues on scorpion shelter choice**
Janina Hladik (*Ulm University, Germany*)

J28 **Cephalopod brains revisited: smart snails or alien intelligence?**
Justin Marshall (*University of Queensland, Australia*)

J29 **Cuing bottom-up attention in bumblebees (*Bombus terrestris*)**
Theo Robert (*Newcastle University, UK*)

J30 **Dynamic homeostatic plasticity within cerebellar circuitry**
Victor Han (*University of Washington, USA*)

METABOLISM, BIOLOGICAL RHYTHMS AND HOMEOSTASIS II

K7 **Temperature-robust REM and SWS in *Laudakia vulgaris***
Mark Shein-Idelson (*Tel-Aviv University, Israel*)

K8 **Exploring diel activity patterns, ecology, and genetics across hyperdiverse Lake Tanganyikan cichlids**
Annika Nichols (*Biozentrum, University of Basel, Switzerland*)

K9 **Activity and energy: The effect of K-ATP channel activity on network output of the pyloric circuit in the *Cancer borealis* stomatogastric ganglion**
Sonal Kedia (*Brandeis University, USA*)

K10 **Modulatory capacity correlates with dietary diversity in three species of decapod crustaceans**
Daniel Powell (*Bowdoin College, USA*)

K11 **Temperature responses of stomatogastric neurons in the brush-clawed shore crab, *Hemigrapsus takanoi***
Wolfgang Stein (*Illinois State University, USA*)

K12 **Network responses to changes in extracellular saline concentration in the lobster *Homarus americanus***
Katrina Carrier (*Bowdoin College, USA*)

METHODS AND EDUCATION

L1 **A method for stereotaxic brain surgery without a brain atlas nor a standard stereotaxic frame**
Yoram Gutfreund (*The Technion, Israel*)

L2 **Ants 3D pose tracking during grasping behaviour**
Florent Le Moël (*University of Edinburgh, UK*)

L3 **Crescent Loom: a flexible neurophysiology online simulation for teaching neuroethology**
Elizabeth Leininger (*New College of Florida, USA*)

EXHIBITORS

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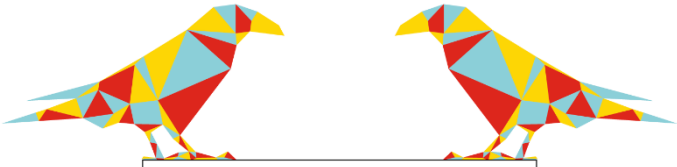

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