



ICN2018

15-20 July 2018 | Brisbane Australia

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International Congress of
Neuroethology

CONFERENCE PROGRAM



International
Society for
Neuroethology

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Contents

Committees..... 3
 Welcome messages..... 4
 General information..... 7
 Venue maps 10
 Social program 12
 Satellite meetings..... 13
 Plenary speakers 16

PROGRAM

Sunday 15 July 26
 Monday 16 July 27
 Tuesday 17 July..... 28
 Wednesday 18 July..... 34
 Thursday 19 July 36
 Friday 20 July 38
 Sponsors and exhibitors..... 42
 Posters..... 43

Congress Organiser



ICMS Australasia
 ISB 2017 Conference Secretariat
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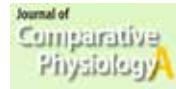
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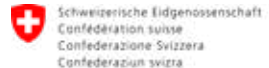
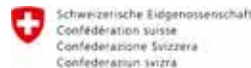


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Welcome Messages



**The Hon
Kate Jones MP**
Minister for Tourism
Industry Development

Welcome to Brisbane

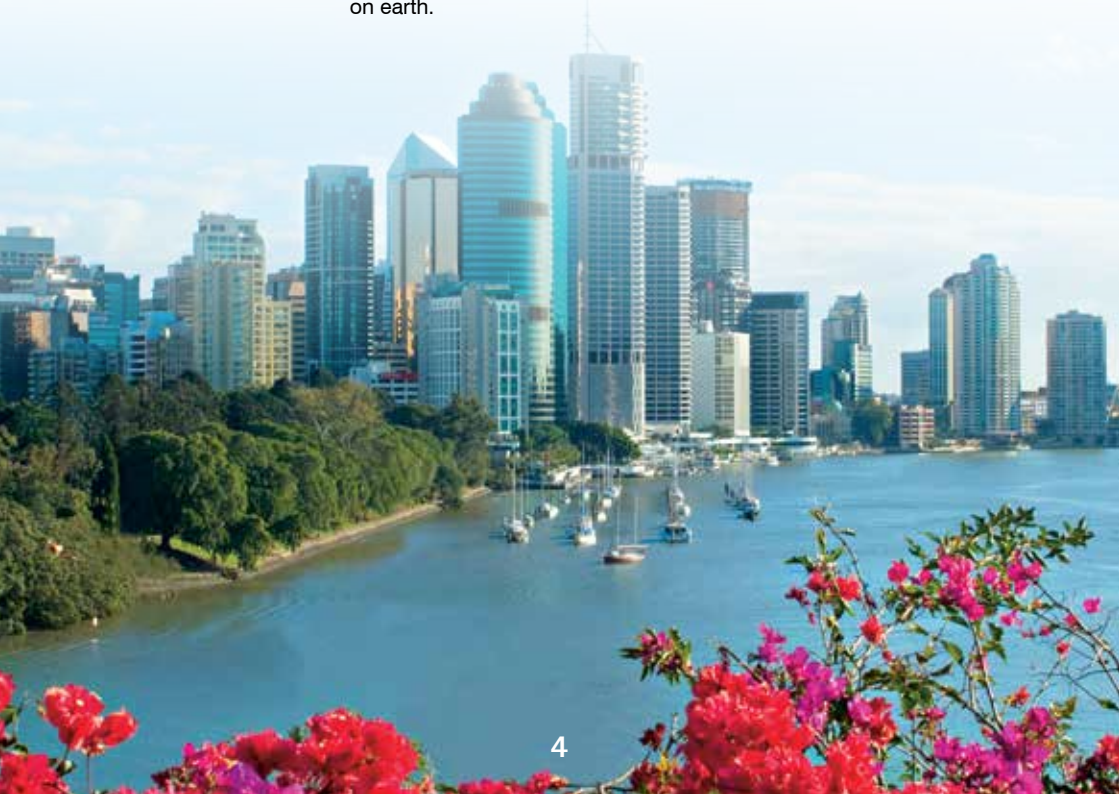
Welcome to Brisbane for the International Congress of Neuroethology for what will be an inspiring five days across an engaging Congress program.

Australia is known for its wonderful nature and wildlife. Queenslanders are proud of our spectacular landscapes – home to an abundance of animals which delegates at this event will enjoy learning more about.

This event will highlight Brisbane as a premier business event destination. Delegates can also enjoy our urban outdoor lifestyle, culture and many tourism experiences around the region.

The Queensland Government is proud to support this event through Tourism and Events Queensland, recognising the importance of business events to the state's tourism economy.

I encourage those visiting to take advantage of your stay and explore Brisbane and Queensland, to experience more of the best address on earth.





**Professor
Catharine H Rankin**
ISN President
2016-2018

Welcome from the ISN President

As the outgoing President of the International Society for Neuroethology (ISN) it is my pleasure to welcome old friends, long-time supporters and people who are attending for their first time to the 13th International Congress of Neuroethology (ICN) in Brisbane, Australia. We are a truly international organization, both in terms of our membership and the location of our Congresses. We have met in North America, South America, Asia, Europe and now Australia. I wonder if there are any Neuroethologists in Antarctica who would be willing to host?? I love these Congresses- to me they are filled with fascinating stories of the wonderful things animals can do and novel insights about how they do them! They are also filled with old friends to catch up with and new friends to get to know.

In addition to wonderful research talks, intriguing and high energy poster presentations the ISN also offers a number of awards and honours. At this Congress we will be recognizing and celebrating many of our contributors. On Tuesday morning we will hear presentations from winners of the Young Investigator Awards. Friday evening at the Business Meeting, we will recognize this and last year's winners of the Capranica Prize; we will also recognize winners of the Heiligenberg Travel Award and the Developing Neuroethology Award, which assists young investigators from the developing world. We will celebrate the newly elected Fellows of the Society for Neuroethology who have made significant contributions to both the field of Neuroethology and to the ISN. An important function of the Business Meeting is to look into the future! Dr. Rui Olivera will give us a preview of the Congress in 2020 in Lisbon, Portugal and we will present the bids for the 2022 Congress location! Make sure you don't miss this!

If you are not already a member of the ISN, please go to www.neuroethology.org and join. Your membership helps promote the kind of science being represented at this conference. We hope that you will find an academic home in the International Society for Neuroethology. Have a wonderful Congress- learn about exciting science, make new friends and enjoy this great city!



Welcome Messages



Professor Justin Marshall
Chair, Local organising committee

Welcome from the chair of the local organising committee

Welcome to the lands Down Under! It is great to see you all here, familiar faces and new friends, and first of all thank you for coming! Those of us that live here know how tiring that journey can be, so with close to 500 delegates at ICN 2018 we, the Australian and New Zealand hosts, really appreciate your collective effort.

There is a fantastic feast of Neuroethology in front of you, not just in the Congress but also in the land around you here and in New Zealand if you plan to travel there also. The animals that live here and the environment are unique, and some of the adaptations for survival astonishing. We hope you have been able to or will be able to take some time around the Congress to see the outside and enjoy our patch of the world as much as we do. Go to the beach, the rainforest, the outback and soak-up something different.

As well as the wondrous wildlife, we – the newcomers to these lands – are privileged to live among Indigenous Australians and Maori in New Zealand who have looked after these lands for millennia before us. Modern society as a whole is still struggling to accept and find ways to adapt to the climate change we ourselves are responsible for. Fortunately, we have been given the opportunity to learn from these ancient cultures. Our children deserve the same wonderful Nature we have been fortunate to witness and not the diminished version of it that our current custodianship promises.

Brisbane is also full of culture and art, some of which you can see within the superb Brisbane Convention and Exhibition Centre, with more in the immediate South Bank area and beyond. There are also over 80 restaurants and cafes within a stone's throw of the Centre, so take time to gather friends and colleagues and enjoy the hospitality that Brisbane can offer.

This welcome is not just from me but comes from the many people who have helped to put this Congress together and the many organisations that have helped sponsor the Congress. On behalf of the International Society for Neuroethology Executive; Catharine Rankin, Susan Fahrback, Karen Mesce, Eric Warrant and Peter Narins, the International Congress of Neuroethology Program Committee and Chairs; Karin Nordstrom and Harold Zakon, myself and all the Local Organising Committee especially Fabio Cortesi, ICMS Australasia, with special mention to Emma Taylor, Suellen Holland and Andrea O'Sullivan, and the superb staff at the Brisbane Convention and Exhibition Centre; welcome to ICN 2018.

General Information

Venue

Brisbane Convention & Exhibition Centre,
Plaza Level, Grey Street, South Bank,
Brisbane, QLD 4101

For the best access to ICN 2018, please use the Grey Street entrance to the Brisbane Convention & Exhibition Centre.

Abstracts

The ICN 2018 abstracts can be found in the PDF abstract book, which can be downloaded from the Congress website.

ATMs

ATMs are located on the Foyer level Grey Street of the Brisbane Convention & Exhibition Centre. ATMs for all major banks can also be found along Grey Street, South Bank, just a short walk from the venue.

Car parking

The Convention Centre's undercover car park can be accessed from Grey Street and is a maximum of AUD26 per day. The car park is open 24 hours a day with onsite security.

Catering

All morning tea, lunch and afternoon tea breaks will be provided in the exhibition area. For break times please refer to the program.

Certificate of attendance

A certificate of attendance will be sent to each delegate post Congress via email.

Children's poster session

We are very excited to have our first Children's poster session, displaying posters created by children accompanying attendees of the ICN. The posters will cover a range of topics. You might even see the poster of a future scientific star!

The posters will be displayed for the entire meeting, with the authors standing by their poster during Monday morning tea, the Tuesday photo session and Thursday afternoon tea, depending on stamina, age and ability to attend.

Cloakroom

A cloakroom is located at the Customer Service Desk located in the Foyer of the Brisbane Convention & Exhibition Centre, providing storage for visitors' and delegates' belongings.

Congress satchel

Every registered delegate will receive an official Congress Satchel upon registration that will include a copy of the congress program, sponsor inserts and other items.

Dietary requirements

If you have advised the Congress Secretariat of special dietary requirements, your catering will be available at a designated table. Please speak to a member of catering staff at the commencement of each meal break / social function.

Disclaimer

The Congress Committee reserves the right to make changes to the Congress program at any time without notice. Please note that this program is correct at the time of printing.

Dress code

The Congress dress code is smart casual.

General Information

Duplication and recording

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

Emergency details

In an emergency telephone 000 for Ambulance, Fire Service or Police. For non-emergency medical situations call 13 12 33 for an ambulance.

Exhibition

The exhibition will be held on the Plaza Level Grey Street and will be open at the following times;

Sunday 15 July	2:00pm – 6:00pm
Monday 16 July	8:00am – 5:00pm
Tuesday 17 July	7:30am – 6:30pm
Wednesday 18 July	8:30am – 12:30pm
Thursday 19 July	8:30am – 6:00pm
Friday 20 July	8:30am – 5:30pm

The Exhibition team is located at the Registration Desk.

Internet

Wireless internet (Wi-Fi) will be available free of charge for delegates at the BCEC. Join the BCEC Link network. There is no password required.

Lost and found

Any found items may be turned into the Registration Desk located outside the Plaza Auditorium. Enquiries about lost items can be directed to the Registration Desk.

Mobile phones

Australia operates on a 3G and 4G/LTE digital network. Delegates are asked to switch off their mobile phones or set them to silent when attending sessions.

Name badges

For security purposes, delegates, speakers, exhibitors and staff are required to wear their name badge to all sessions, the exhibition and social functions. Entrance into sessions is restricted to registered delegates only. If you misplace your name badge please see staff at the registration desk to arrange a replacement.

Posters

Posters are located in P9-P11 and in the foyer of the plaza level. Poster presenters are asked to be by their poster during the allocated poster viewing sessions to discuss their poster with delegates.

Program

Every endeavour has been made to produce an accurate program. If you are presenting at the Congress, please confirm your presentation times as contained within this program.

Registration desk

The registration desk is located outside of the Plaza Auditorium on the Plaza Level (Grey Street) of the Brisbane Convention & Exhibition Centre. The desk will be open at the following times.

Sunday 15 July	2:00pm – 6:00pm
Monday 16 July	8:00am – 5:00pm
Tuesday 17 July	7:30am – 6:30pm
Wednesday 18 July	8:30am – 12:30pm
Thursday 19 July	8:30am – 6:00pm
Friday 20 July	8:30am – 5:30pm

Security

Please ensure that you take all items of value with you at all times when leaving a room. Do not leave bags or laptop computers unattended.

Smoking

Smoking is not permitted indoors at the Brisbane Convention & Exhibition Centre. Smokers must always remain at least 4m from any doorway when smoking. Fines can be imposed for smoking in prohibited places.

South Bank concierge

There is nothing better than getting out to experience the local surrounds of a new city, and South Bank, only a short stroll away from the Brisbane Convention & Exhibition Centre, is brimming with incredible conference exclusives awaiting ICN 2018 delegates. You will have received a Concierge Card in your ICN 2018 Satchel. By using the South Bank Concierge website and activating your Concierge card, you can unlock incredible conference exclusives throughout the South Bank precinct. Not only will you receive 10% off at participating retailers, you can also book event tickets, plan your itinerary and access special offers, plus so much more. Visit <https://www.eatsouthbank.com.au/concierge/concierge-delegate/> now.

Speakers

Please ensure you are available in your presentation room at least 10 minutes prior to the start of the session. Please be sure to load your presentation with the AV technicians in your presentation room during the catering break prior to your scheduled presentation time.

Taxes

A Goods and Services Tax (GST) of 10% applies to all consumer goods, and is included in retail prices.

Tours desk

The team from Brisbane Marketing will be located within the Exhibition to assist delegates who may wish to book tours and activities within Brisbane during the Congress. If you have any questions about Brisbane, transport or services, please visit the Brisbane Marketing tours desk.

Transport

Getting around South East Queensland using public transport is easy. On <http://translink.com.au/travel-information> you'll find timetables, maps and destinations, plus everything you need to know about catching a bus, train and ferry. There is also information about late night services and safety and security.

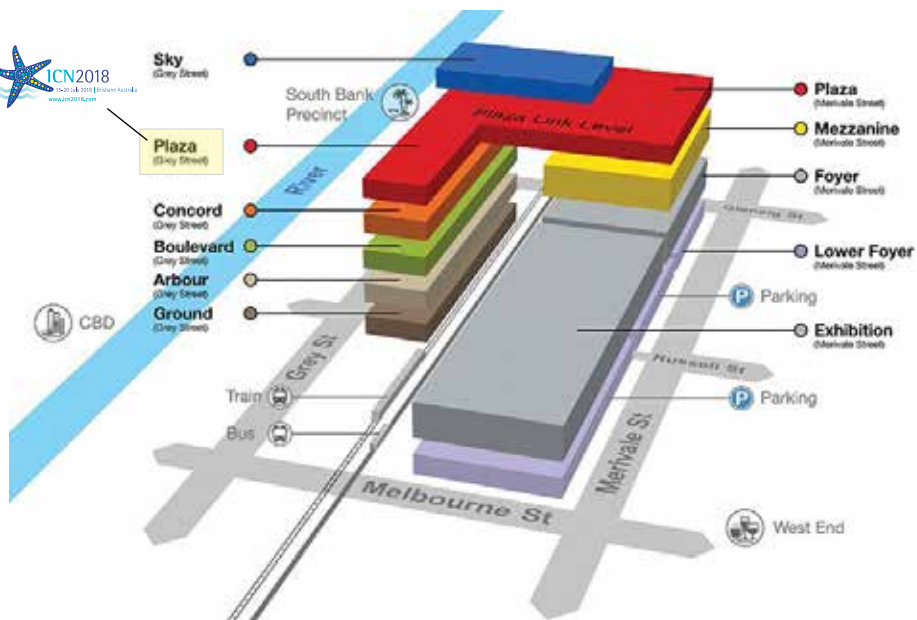
Weather

See the Australian Bureau of Meteorology website (www.bom.gov.au) for daily weather information.

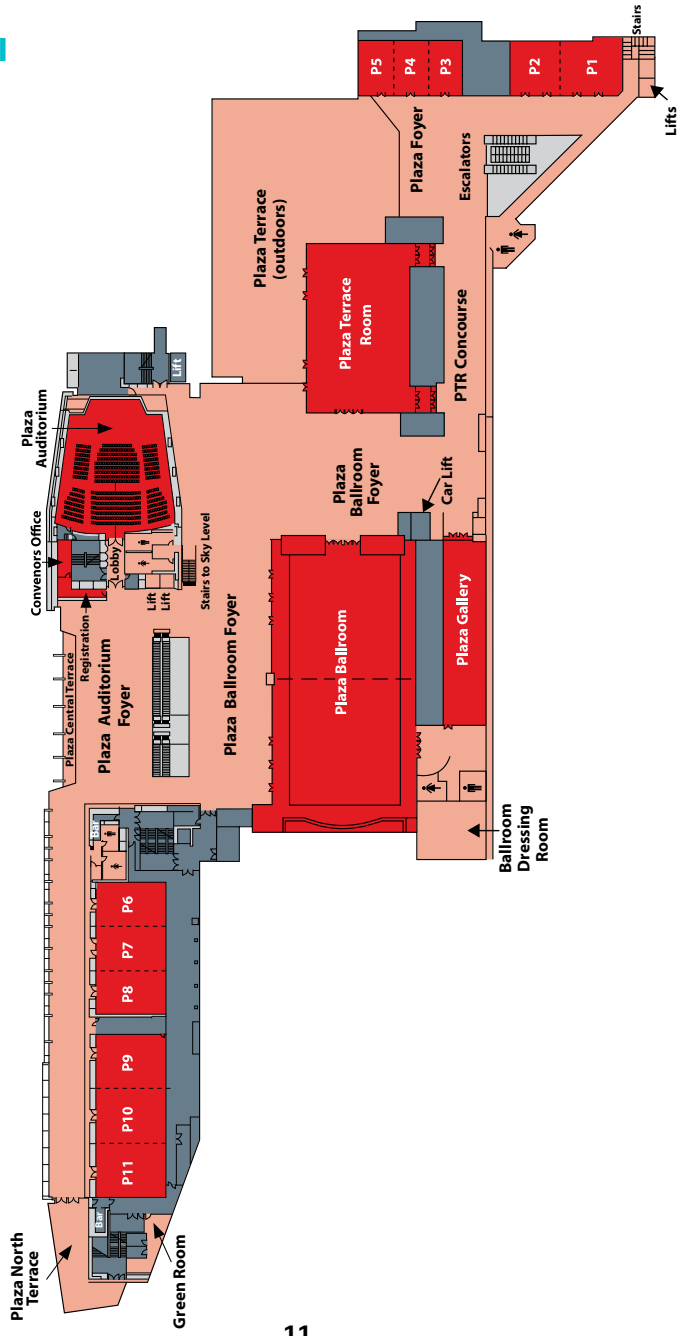
Venue Maps



ICN2018
15-19 July 2018
www.icn2018.com



Plaza Level



Social Program

Welcome reception

Sunday 15 July 2018

5:30pm – 7:30pm

Plaza Foyer (Grey Street) Brisbane Convention & Exhibition Centre

Dress: Smart casual

Included with fully paid delegate registration (excludes day registration)

Tickets may be purchased in advance for AUD \$75.

Lone Pine Koala Sanctuary – Delegate tour

Wednesday 18 July 2018

Meeting Time: no later than 1:45pm

Departure Time: buses will depart at 2:00pm sharp

Assembly Point: Grey Street Foyer, Brisbane Convention & Exhibition Centre, Grey Street

Return Time: approximately 6:00pm

Dress: Casual

Tickets may be purchased in advance for AUD \$75.

Congress banquet

Friday 20 July 2018

7.00pm – 10.30pm

Riverlife, Naval Stores Kangaroo Point Cliffs Drive, Kangaroo Point QLD 4169

Dress: Smart casual

Included with full paid delegate registration (excludes day registration).

Tickets may be purchased in advance for AUD \$125.

See page 60 for directions to Riverlife.



Satellite Meetings

The below satellite meetings were held prior to and in conjunction with the ICN 2018 Congress.

Zebrafish Neuroethology

14 July 2018

Customs house, Brisbane, Australia

In recent years, the zebrafish larva has become a powerful vertebrate model for neuroethology research. Its optical accessibility, a known genome and a vast library of promoters and mutants, make the zebrafish specially suitable for otogenetics and cutting-edge optical methods (e.g. light-sheet microscopy, holographics) to monitor and manipulate neuronal activity. In addition, the zebrafish has a complex although discrete repertoire of motor behaviours, making an ideal vertebrate preparation for the study of neuronal circuit dynamics underlying motor behaviour. The purpose of this meeting is to bring together researchers interested in the study of neural circuits and behaviour, and to introduce the zebrafish model to the neuroethology community which allows the use of state-of-the-art technical approaches to ask neuroethological questions and test specific hypotheses with unprecedented power and infeasible using other animal models.

Australasian Society for the Study of Animal Behaviour (ASSAB) 2018 Conference

12-14 July 2018

Brisbane Convention & Exhibition Centre, Brisbane, Australia

Animal Behaviour researchers are an extraordinarily diverse group united by a common interest in the scientific study of Animal Behaviour. ASSAB provides a valuable unifying forum. In particular, the annual conference provides a wonderful opportunity to share ideas and perspectives with other Animal Behaviour researchers from across Australasia.



Electric Fish

14-15 July 2018

Brisbane Convention & Exhibition Centre, Brisbane, Australia

From genes to behavior to ecology: Integrative and comparative approaches to electroreception and electrogenesis research. Research on electroreception and electrogenesis has provided key findings of general significance that integrate organismal biology at successive levels of organization. Research within this community investigates causation from genes to molecules, cells, and circuits that produce ecologically important animal behaviors. This meeting is expected to generate new ideas and directions for researchers working on electrosensory systems, particularly on integrating genomic approaches towards building better understanding of how genes control sensory processing, perception, and behavior. Moreover, the results presented at the meeting are expected to contribute to progress in neurobiology, neuroethology, evolution, and other fields of research.

Satellite Meetings

Biosonar Satellite Symposium

15 July 2018

Brisbane Powerhouse, Brisbane, Australia



The goal of the International Animal Biosonar Meeting is to bring together currently active researchers at all career levels to evaluate new methods, new findings, and new concepts for advancing our understanding about the formation and content of the images perceived by echolocating animals. The plan is to focus on several topics of integrative nature. Bat sonar has long been one of the core model systems for neuroethology. Past International Congresses for Neuroethology have included echolocation symposia, and prior international conferences on animal biosonar have kept the field largely informed of recent research. However, methodological, experimental, and theoretical progress achieved in the past decade has outstripped its dissemination across the field of echolocation research, as well as neuroethology more generally. The Brisbane International Animal Biosonar meeting will assess new acoustic, behavioral, neurophysiological, and computational results so the participants can integrate this new knowledge into their own particular research programs.

Patterning Neural Activity in the Central Nervous System – Leigh Marine Laboratory Satellite

12-14 July 2018

Leigh Marine Laboratory, Auckland, New Zealand

The formation of patterned neural activity in the Central Nervous System has been a long standing topic in neuroethology. Such pattern formation encompasses the motor output of central pattern generators (GPGs) for rhythmic behaviours, the neural correlates of sound production (vertebrate and invertebrate); song learning, and other forms (such as sensory input processing by cerebellar granule cell networks). The topic is explicitly chosen to be common to a wide range of neuroethology themes.

Herpetology

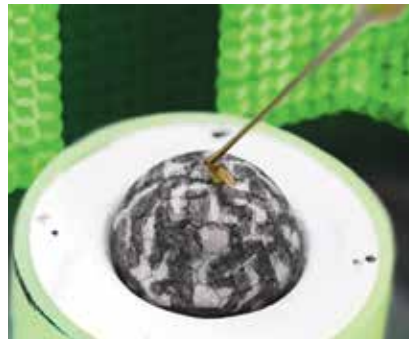
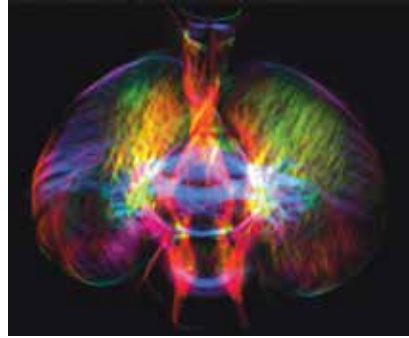
14 July 2018

The University of Queensland, Brisbane, Australia

The satellite meeting on “Herpetology Behavior, Ecology and Evolution” will allow students, postdocs and junior faculty the opportunity to receive focused commentary on their latest research and to establish international collaborative relationships with experts in this unique and diverse group of animals. This satellite will emphasize the unique and universal aspects of amphibian and reptile neurobiology, including motor pattern generation, predator-prey interactions, acoustic communication, behavior, physiology, ecology and conservation. Expanding beyond the scope of previous amphibian satellite workshops, this will be the first herpetology satellite at ICN, allowing the examination of synergistic themes between amphibians and reptiles, in honor of Australia’s strong history in reptile biology.

THE UNIVERSITY OF QUEENLAND'S

Queensland Brain Institute



QBI is a world-leading neuroscience research institute, working to understand the development, organisation and function of brains of all types.

We aim to understand the neural circuits in brains, and how their function and dysfunction results in behavioural outcomes, disorders and diseases.

QBI has opportunities in the following post-graduate research:

Masters of Philosophy

Masters of Philosophy (neuroscience)

PhD

For more information visit:

www.qbi.uq.edu.au



THE UNIVERSITY
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Plenary Speakers



Assistant Professor Lauren O'Connell

**Assistant Professor
Stanford University, USA**

Lauren's research focuses on understanding how evolutionary innovations in behavior and physiology arise. Lauren uses poison frogs as a model for understanding how variation in predation and spatial structure of the environment has driven the evolution of chemical defences and parental behaviors. Lauren's research combines both lab and field studies to understand the neural basis of decision-making within ecologically relevant contexts. Lauren was a Bauer Fellow at Harvard University before joining the Department of Biology at Stanford University as an Assistant Professor.

Insights into the evolution of parental behavior from poisonous amphibians

2:00pm – 3:00pm, Monday 16 July 2018, Plaza Auditorium

Parental care is a key evolutionary innovation that facilitates the exploitation of novel habitats, influences fitness and survival of parents and offspring, and serves as an evolutionary precursor to the emergence of social behavior. Various parental care strategies have evolved in multiple taxa, yet the underlying mechanisms promoting the evolution of these behavioral phenotypes are poorly understood. Poison frogs show remarkable variation in parental care strategies including male- and female-uniparental care and biparental care. Importantly, paternal and maternal care occur with and without pair bonding in this clade, allowing disentanglement of parental care behaviors from pair-bonding. Parental care in poison frogs involves defense and hydration of embryos during development, and transportation of tadpoles by piggyback to pools of water. In species in which females care for offspring, mothers nourish growing tadpoles with trophic eggs until metamorphosis is complete. I will first discuss tadpole transport behavior that involves comparative work across three closely related species and has given us insights into general themes on parental care neural circuits across sexes and species. Specifically, we have found that the hypothalamus and hippocampus are critical in promoting parental care in frogs and have identified the neuromodulators that promote these behaviors in amphibians and other vertebrates. Second, I will zoom out to look at the convergent evolution of maternal care in two independent evolutionary origins of poison frogs in South America and Africa. In our focal species that diverged 150 million years ago, mothers provide trophic, unfertilized eggs to their developing tadpoles. Both species lace these eggs with neurotoxins, providing insight into how these energetically costly behaviors are maintained. Although we find convergence at the level of behavior, we have found that the molecular mechanisms underlying these behaviors are different. Finally, we will explore the parent-offspring interactions that facilitate this egg-feeding behavior by examining the neural basis of begging behavior in tadpoles. Tadpole begging behavior is an honest indicator of need where tadpoles must make life-or-death decisions about

whether or not to beg in response to a visitor to their bromeliad, who may be their mother or a predator. Moreover, the tadpoles must tune these energetically costly begging displays with overall nutritional state. Overall this body of work is providing insight into the evolution of parent-offspring interactions and highlights the importance of comparative work based both in the lab and in the field in contributing to our understanding of behavioral evolution.



Professor Giovanni Galizia

**Professor for Neuroscience
University of Konstanz, Germany**

Giovanni Galizia is professor for neuroscience at the University of Konstanz, Germany, since 2005, and Director of the Zukunftskolleg (a center for advanced studies for young researchers) at the same University. He studies the olfactory system in insects. Before Konstanz, he was Associate Professor for Entomology in Riverside, California (2003-2005) and Research Group Leader at the Freie Universität Berlin (1999-2005). He holds a PhD in Zoology from the University of Cambridge, UK (1993).

Odor evoked activity across brain layers: Codes, patterns and memories

2:00pm – 3:00pm, Tuesday 17 July 2018, Plaza Auditorium

Most odors are encoded by combinatorial activity across neurons, in sequential neural layers: olfactory receptor neurons (vertebrate nose, insect antennae), olfactory glomeruli (olfactory bulb, antennal lobe), higher order brain centers (piriform cortex, mushroom body). Olfactory stimuli elicit complex spatio-temporal patterns of neural activity. What is the readout? Does the brain need the full spatio-temporal pattern to recognize an odor, or is a snapshot sufficient? Learning experiments show that odors are recognized almost immediately at stimulus onset, also when during training they are learned later or even after stimulus offset. This suggests that different time windows fulfill different tasks, or are used in different ways by the brain. We have analyzed the temporal development of odor information in different neuron populations in the fruit fly *Drosophila melanogaster*: receptor neurons, projection neurons in the antennal lobes (dendrites and somata), and Kenyon Cells in the mushroom bodies (dendrites and somata). When measuring calcium concentration changes, odor information was stable during odorant presentation both for short and long stimuli, and changed after odor offset, providing reliable information about both odorant onset and offset. For a subset of Kenyon cell somata, however, we found ongoing odor information for several seconds beyond odor offset, suggesting a neuronal substrate for sensory memory that could be used in trace conditioning situations, i.e. when a reward arrives after stimulus offset. We show that it is necessary to analyze subcellular compartments: information across cell bodies has different temporal progression (and information content) than across dendrites, possibly indicating multitasking within cells.

Plenary Speakers



Professor William B. Kristan

**Emeritus Distinguished Professor
Section of Neurobiology, Division of Biological Sciences, University
of California, San Diego, USA**

Bill has studied the neuronal circuits for several behaviors (bending, shortening, crawling, swimming, feeding) in the medicinal leech as well as the ways that these behaviors are chosen when activated simultaneously. Along with Dr. Kathy French, he has also studied the development of leech neurons and their connections. Bill received his PhD in Physiology at the University of Pennsylvania, then did postdoctoral research at Stanford and UC Berkeley before joining the faculty of the Biology Department at UCSD, where he spent his career.

Franz Huber Lecture - Thinking like a leech: A neuroethological view of behavioural choice

5:30pm – 6:30pm, Tuesday 17 July 2018, Plaza Auditorium

In 1951, Nikko Tinbergen proposed—based purely upon behavioral observations—that animals chose to perform one of many possible behaviors based upon “inhibitive interactions” among “centres” responsible for initiating a particular behavior. In the early 1970’s, Jack Davis and his colleagues, working on the marine slug, *Pleurobranchaea*, translated this notion into more specific neuronal terms: they showed inhibitory synaptic connections onto “command neurons” responsible for eliciting a particular behavior A by eliciting behavior B. These early studies also established the “competing behaviors” paradigm for studying behavioral choice: simultaneously deliver two stimuli, each of which produces a distinct behavior, then see which behavior wins out. More recent studies on other mollusks have produced mixed results. I will discuss two types of behavioral choice mechanisms that my laboratory has found, using leeches, one that shows a type of inhibitive interaction and a second that implicates different dynamical states of a complex decision-making network. As a graduate student, Quentin Gaudry studied how feeding behavior in the European medicinal leech predominates over mechanosensory-induced behaviors (crawling, shortening, and local bending). He did find inhibitive interactions, but they were not at the level of command neurons. Instead, the detection of food and the act of feeding produced profound presynaptic inhibition of the mechanosensory neurons all over the body. Effectively, when a leech detects a meal, it becomes numb to mechanosensory input because transmission across the first-order mechanosensory synapses is blocked. In studying the choice between swimming and crawling, Kevin Briggman found no evidence of inhibitive interactions. Instead, he found that the same neurons—including command neurons—are activated by stimuli that lead to both behaviors, but these neurons were activated in different patterns when swimming was activated than when crawling occurred. This result suggests that this behavioral choice is made by the dynamics of the same neuronal system rather than by inhibition among behaviorally appropriate command neurons. Why should there be such different mechanisms of

behavior choice in the same nervous system? One reason seems to be differences in lifestyle: feeding inhibits mechanosensory-induced behaviors only in sanguivorous leeches (for whom blood meals are rarely available, and they gorge themselves when they have the opportunity) and not in carnivorous leech species (which take small meals of more readily-available sources). Another reason may be evolutionary and functional: swimming behavior probably evolved from crawling behavior and these leech nervous systems may have kept their overlapping circuitry so that they can switch readily between the two locomotory behaviors. Hence, thinking like a neuroethologist—and like a leech—can point experimentation in useful directions.



Professor Mandyam V Srinivasan

Professor of Visual and Sensory Neuroscience and Electrical Engineering

**Queensland Brain Institute and School of Information Technology and Electrical Engineering
University of Queensland, Australia**

Srinivasan's research focuses on the principles of visual processing, perception and cognition in simple natural systems, and on the application of these principles to machine vision and robotics. He holds a B.E. in Electrical Engineering from Bangalore University, an M.E. in Electronics from the Indian Institute of Science, a Ph.D. in Engineering and Applied Science from Yale University, a D.Sc. in Neuroethology from the Australian National University, and an Honorary Doctorate from the University of Zurich. He is a Fellow of the Australian Academy of Science, and of the Royal Society of London.

Bees, birds and flying machines

9:00am – 10:00am, Wednesday 18 July 2018, Plaza Auditorium

Flying insects and birds are remarkably adept at seeing and perceiving the world, and navigating effectively in it. This presentation will describe our recent progress in understanding how honeybees and birds (Budgerigars) use their vision to guide and control several aspects of their flight such as regulating flight speed, negotiating narrow passages, selecting routes, and avoiding mid-air collisions, using computational principles that are often elegant and unprecedented. It will conclude with an update of our advances in the design and testing of biologically inspired vision systems for the guidance of autonomous aerial vehicles.

Plenary Speakers



Dr Karen Cheney

Research Fellow

**School of Biological Sciences, Queensland Brain Institute
University of Queensland (UQ), Australia**

Karen has a strong interest in the evolution of animal colour patterns, and particularly focuses on what they are used for and how they are perceived. She uses a variety of lab and field techniques, including behavioural experiments, spectrophotometry, theoretical visual modelling, and colour pattern measurements. Her main study animals are marine fish and invertebrates, including brightly coloured nudibranch molluscs and collaborates with chemists to understand how chemical defences are related to colour signals. Karen received her PhD from the University of East Anglia, UK and later travelled to Australia on a Royal Society Fellowship. She now works at the University of Queensland in Brisbane, Australia.

Colour vision, perception and patterns: Insights from coral reef fish

9:00am – 10:00am, Thursday 19 July 2018, Plaza Auditorium

The natural world provides an inspiring palette of colour signals and highlight the importance of colour in many animals' daily lives. Indeed, colour patterns are used to attract mates, avoid detection, compete for resources and warn predators of underlying defenses. However, to investigate the function and evolution of such signals, we must understand how colour signals are processed and perceived by animals. Recent studies of animal colour vision have focused on the identification of physiological mechanisms, including photopigment and photoreceptor spectral sensitivities and neurons coding for opponency mechanisms, and on theoretical models to predict colour discrimination from this information. However, such data and models cannot replace behavioural tests of colour perception. In this talk, I will present recent studies we have conducted using a coral reef fish as a model system. I will first discuss an innovative method inspired by Ishihara colour vision tests to determine colour discrimination thresholds across different areas of colour space. The method uses an oddity from sample method, which can be used to measure discrimination thresholds and the detection of suprathreshold colours, but may also be used to examine a number of questions about visual processing. Second, I will discuss behavioral studies that have investigated the perception of colour patterns used to avoid predation, including warning signals and disruptive coloration. Specifically, I will discuss how predators may only pay attention to part of the signal when learning to avoid aposematic prey. Finally, I will present work investigating whether fish see visual (lightness) illusions in the same way as we do.



Professor Yossi Yovel

**Head of NeuroEcology
Tel-Aviv University, Israel**

Yossi Yovel is the head of the NeuroEcology lab in Tel-Aviv University. The lab aims to address the gap between Neuroscience and Ecology by developing miniature technologies that enable to conduct controlled experiments with wild animals in their natural environment. The lab focuses on echolocating bats and is interested in a wide range of fundamental behaviors including long and short-range navigation, social networks and collective behavior, sensory decision making, inter-sensory integration, and vocal communication, as well as bio-sonar and bio-inspired robotics.

From sensory perception to foraging decision making – the Bat's point of view

2:00pm – 3:00pm, Thursday 19 July 2018, Plaza Auditorium

Bats are remarkable aviators and amazing navigators. Many bat species nightly commute dozens of kilometers in search of food, and some bat species annually migrate over thousands of kilometers. Studying bats in their natural environment has always been extremely challenging because of their small size (mostly <50 gr) and agile nature. In the past few years, we have developed novel miniature technology to GPS-tag small bats, opening a new window to document their behaviour in the wild. However, the movement of an animal alone is not sufficient for studying its behaviour and its decision processes. We therefore equipped our miniature GPS devices with an ultrasonic microphone, which allows monitoring the sonar and social communication of freely behaving bats. Because echolocating bats rely on sound emission to perceive their environment, on-board recordings enable us to tap into their sensory 'point of view' and to monitor fundamental aspects of their behaviour such as attacks on prey and interactions with conspecifics. This intimate description of their behaviour allows us to examine sensory decision making under natural conditions. I will present several projects that examined how bats combine sensory information with social information in order to optimize foraging. I will also present our current effort to include more on-board sensors for studying of bat Neuro-Ecology including acceleration, EEG, physiology and environmental sensors.

Plenary Speakers



Associate Professor Ana Silva

Associate Professor

Instituto Clemente Estable – Universidad de la Republica, Uruguay

Ana's research focuses on understanding the neuroendocrine bases of social behavior in general, and agonistic behavior in particular. Combining field and lab approaches, Ana's research seeks to understand how aggression shapes the spacing behavior of species in the wild, as well as how the brain controls the acquisition and consolidation of the dominance-subordinate status. To do so, Ana's group has been working on a native species of South American weakly electric fish, in which they have identified a uniquely clear-cut example of pure territorial aggression among teleosts. Ana directs the Laboratory of Neuroscience of the School of Sciences at Universidad de la República as Associate Professor, and the Unit of Neural Bases of Behavior at the Instituto Clemente Estable as Associate Researcher.

The Walter Heiligenberg Lecture - Dominant versus subordinate brains: The establishment and consolidation of hierarchy

3:00pm – 4:00pm, Thursday 19 July 2018, Plaza Auditorium

Neuroethological model systems give the opportunity of bridging the gap between natural behaviors and the comprehension of their underlying mechanisms. *Gymnotus omarorum* is a sexually monomorphic weakly electric fish that inhabits the southernmost border of continental distribution of Gymnotiformes in South America. In its natural habitat, *G. omarorum* holds symmetric territories between males and females across seasons. During breeding, territory size is correlated with circulating steroid hormone levels. Interestingly, in the non-breeding season, when foraging is the only drive, territories only depend on body size and are established independently of circulating steroid hormone levels. As territoriality is mediated by agonistic encounters, the gonadal hormone-independent mechanisms underlying the non-breeding territoriality of *G. omarorum* can be evaluated by testing its agonistic behavior in laboratory settings. A clear dominant-subordinate status emerges within minutes in intrasexual and intersexual dyadic encounters of non-breeding *G. omarorum*. Body size is the only predictor of contest outcome. Dominants are highly aggressive even after the contest is resolved, while subordinates display a sequential pattern of submissive electric signaling and retreat. Both females and males are aggressive, and do not differ in fighting ability nor in the value placed on the resource. Although aggression is completely independent of circulating steroids and persists after castration, non-gonadal estrogenic pathways participate in the modulation of this non-breeding aggression. On the other hand, hypothalamic neuropeptides of the vasopressin-oxytocin family (arginine-vasotocin, AVT, and isotocin in teleosts) are known to be key modulators of social behavior, adapting their actions to different contexts. AVT modulation of the establishment of *G. omarorum* dominant-subordinate status has been explored by

pharmacological and cellular techniques. The non-breeding territorial aggression of *G. omarorum* provides the clearest example of non-overlapping status-dependent effects of AVT among teleosts: while in dominants AVT promotes aggression without affecting their electric displays; in subordinates, AVT induces an increase in the emission of electric submissive displays without affecting their aggression levels. The endogenous release of AVT during the establishment of dominance is supported not only by pharmacological but also by cellular data. A depletion in AVT content is observed in the soma of AVT neurons in the dominants' preoptic area by immunohistochemistry immediately after the establishment of dominance. In a more long-term, after 2 days of dominance consolidation, a distinctive status-dependent brain transcriptomic pattern emerges. Overall, a long trajectory of neuroethological studies, combining field and laboratory approaches in a wild South American species, enabled the emergence of a new model system, which has already contributed novel aspects in the modulation of aggression in vertebrates.



Professor Azusa Kamikouchi, PhD

**Neuroscience Institute of the Graduate School of Science
Nagoya University, Japan**

The aim of my research is to understand the basic principle how the brain works. Especially, I have a strong interest in the auditory system and one of my questions is how acoustic signals are detected, processed, and integrated in the brain. The fruit fly is an ideal model organism for such a task, because of its sophisticated genetic tools to analyze neurons and manipulate neural circuits in the brain. I started a project to unravel the anatomical and functional organization of the auditory system of fruit flies at the National Institute for Basic Biology, Japan in 2002. Then I moved to the University of Tokyo, to establish a comprehensive projection map of the auditory sensory neurons. To extend this map into a functional map, I moved to the University of Cologne, at Martin C. Göpfert's group (now in Göttingen). In 2008 I went back to Japan as an associate professor at Tokyo University of Pharmacy and Life Sciences and then moved to Nagoya University in 2011 as a full-professor.

Organisation of the auditory system in fruit flies

9:00am – 10:00am, Friday 20 July 2018, Plaza Auditorium

How does the brain process acoustic information? Revealing the anatomic and functional organizations of the auditory system is indispensable to answer this question. The fruit fly is ideally suited for tackling such tasks, due to its small brain size and a rich repertoire of genetic tools. Moreover, they use acoustic signals to communicate with each other. How does a tiny fly brain evaluate the species-specific communication sound? Toward comprehensive

Plenary Speakers

identification of auditory neural circuits in the fly brain, we systematically identified the auditory sensory neurons and their downstream neurons. The anatomic and physiological analyses revealed frequency segregation at the first layer of the auditory pathway and the convergence of frequency information in the subsequent downstream pathways. Second-order auditory neurons have intensive binaural interactions, raising the possibility that the fly is capable of comparing acoustic signals detected at the left and right ears. Based on our analysis, we established the first comprehensive map of primary and secondary auditory neurons in the fly brain, which are characterized by frequency segregation and convergence, binaural interaction, and multimodal pathways. We used this anatomic information to understand how each type of neurons and neural circuits contribute to the courtship-song detection in flies. Activity imaging and silencing of each neuronal type revealed how the selective response to species-specific song was established. These results provide new insights into the neural-circuit basis to adjust neuronal and behavioral responses to a species-specific communication sound.



Professor Michael Dickinson

**Zarem Professor of Bioengineering & Biology
California Institute of Technology, Pasadena, CA,
USA**

Complex and intellectually challenging problems can be so commonplace that they escape our attention. The research in my lab focuses on one such everyday phenomenon – the motion of a fly through the air. While the buzz of fly wings is more likely to elicit a sense of annoyance than wonder, insect flight behavior links a series of fundamental processes within both the physical and biological sciences: neuronal signaling within brains, the dynamics of unsteady fluid flow, musculoskeletal mechanics, the structural mechanics of composite materials, ecology and evolution. The aim of my research is to elucidate the means by which flies accomplish their aerodynamic feats using an interdisciplinary approach. I received a Ph. D. in Zoology at the University of Washington in Seattle in 1991 and then worked briefly at the Max Planck Institute for Biological Cybernetics in Tübingen before starting my own lab as an Assistant Professor at the University of Chicago in 1991. I am currently the Abe and Esther Zarem Professor in the Division of Biology and Bioengineering at Caltech.

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Straighten up and fly right: Using a modern fly to reconstruct behaviours of an ancient world

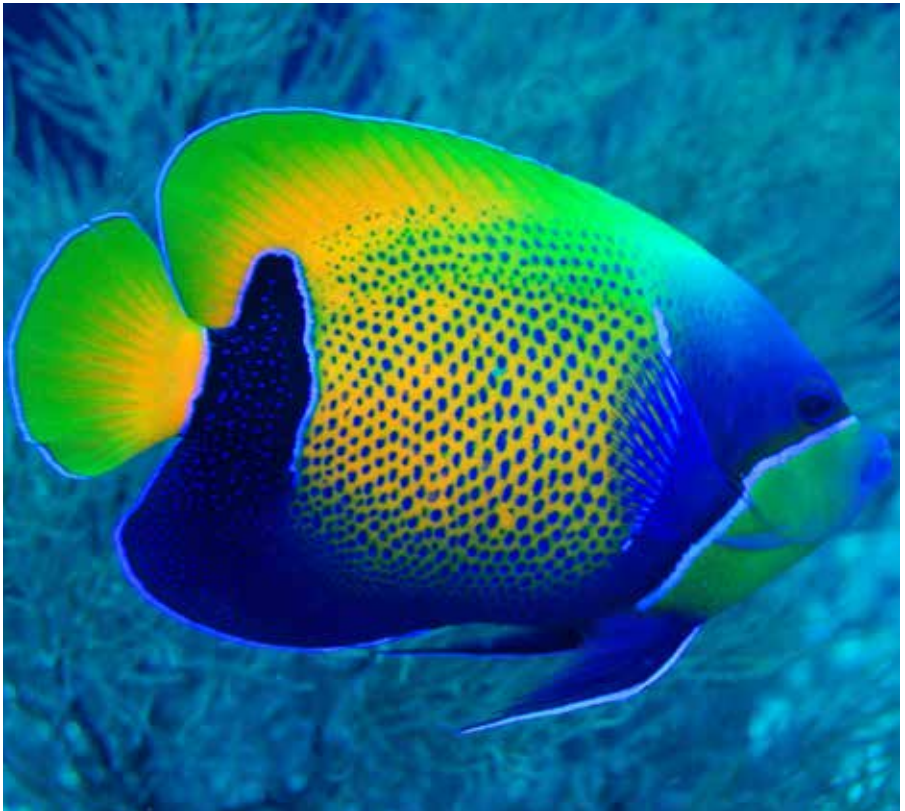
2:00pm – 3:00pm, Friday 20 July 2018, Plaza Auditorium

Over 400 million years ago, a group of tiny six-legged creatures evolved the ability to fly—an event that fundamentally transformed our planet. Equipped with the ability to fly, insects underwent an extraordinary radiation and have dominated every terrestrial ecosystem ever since. In order to fly effectively, these ancient insects must have possessed the rudimentary ability to take off, fly stably, disperse, forage, and land — a core set of behavioral modules that I term ‘The Devonian Toolkit’. The fact that the basic architecture of the nervous system is remarkably uniform across species further suggests that many behaviors of modern insects are deeply rooted in this common evolutionary history. My lab is attempting to reconstruct the behavior and ecology of ancestral insects through investigations of the common fruit fly, *Drosophila melanogaster*. Most experiments on fly behavior and physiology have been confined to small laboratory chambers, yet the natural history of these animals involves dispersal that takes place on a much larger spatial scale. New release-and-recapture experiments in the Mojave Desert confirm that flies can navigate over 10 kilometers of open landscape in just a few hours. Such excursions are only possible because flies can actively maintain a constant heading using a variety of sensory cues. In this talk, I will discuss a hierarchy of neural mechanisms that enable flies to maintain a stable course in the face of external and internal perturbations. Collectively, this new research provides insight into ancient sensory-motor modules that have helped make insects the most successful group of animals in the history of life.

SUNDAY 15 July 2018

PROGRAM - SUNDAY 15 July 2018

4:30pm – 5:30pm	Opening Ceremony	PLAZA AUDITORIUM
4:30pm – 4:45pm	Welcome to country Nunukul Yuggera	
4:45pm – 5:00pm	Welcome to ICN 2018 Professor Catharine Rankin	
5:00pm – 5:15pm	Welcome from the Program Committee Professor Harold Zakon & Professor Karin Nordström	
5:15pm – 5:30pm	Welcome to Brisbane Professor Justin Marshall	
5:30pm – 7:30pm	Welcome Reception	Exhibition, Plaza Foyer



MONDAY 16 July 2018

JCPA Presidential Symposium PLAZA AUDITORIUM Chairperson: Professor Catharine Rankin

- PS1 9:00am – 9:30am Molecular exploitation of extreme physiology present in African rodent diversity
Professor Gary Lewin
- PS2 9:30am – 10:00am Celestial orientation and dirty dancing: from behaviour to neurons
Professor Marie Dacke

10:00am – 10:30am Morning Tea EXHIBITION, PLAZA FOYER

JCPA Presidential Symposium PLAZA AUDITORIUM (Continued) Chairperson: Professor Catharine Rankin

- PS3 10:30am – 11:00am The widespread and long-term evolutionary consequences of human behavior
Dr George Perry
- PS4 11:00am – 11:30am Complex magnetic orientation behavior from a simple nematode
Professor Jon Pierce
- PS5 11:30am – 12:00pm Molecular insights into the evolution of mosquito preference for human odor
Assistant Professor Carolyn McBride
- PS6 12:00pm – 12:30pm Surprising origins of sex differences in the brain
Professor Margaret McCarthy

12:30pm – 2:00pm Lunch EXHIBITION, PLAZA FOYER

Plenary Lecture 1 PLAZA AUDITORIUM Chairperson: Professor Harold Zakon

- PL1 2:00pm – 3:00pm Insights into the evolution of parental behavior from poisonous amphibians
Assistant Professor Lauren O'Connell

3:00pm – 5:00pm Poster Session P9 – P11 & Foyer
Including Afternoon Tea from 4:00pm – 4:30pm

TUESDAY 17 July 2018

PROGRAM - TUESDAY 17 July 2018

This session is sponsored by



Young Investigator Award Symposium

PLAZA AUDITORIUM

Chairperson: Associate Professor Eric Fortune

- | | | |
|-----|------------------|---|
| YI1 | 8:00am – 8:30am | Spatial summation in hawkmoth lamina monopolar cells
Dr Anna Stöckl |
| YI2 | 8:30am – 9:00am | Tadpole fight club: Neural mechanisms of conspecific juvenile aggression in poison frogs
Dr Eva K Fischer |
| YI3 | 9:00am – 9:30am | Songbirds can associate arbitrary visual cues with learned song modifications
Dr Lena Veit |
| YI4 | 9:30am – 10:00am | Mechanosensory and visual integration in the fly central complex
Dr Nicholas Kathman |

10:00am – 10:30am

Morning Tea

EXHIBITION, PLAZA FOYER

CONCURRENT INVITED SYMPOSIA

S1: Challenging the notions of pain, problem-solving and cognitive ability across taxa. P8
Chairperson: Associate Professor Ximena Nelson

- | | | |
|------|-------------------|---|
| S1-1 | 10:30am – 11:00am | Comparative Cognition and welfare – a fishy perspective
Dr Paul Hardy-Smith |
| S1-2 | 11:00am – 11:30am | Third-party knowledge and ‘politics’ in ravens
Professor Thomas Bugnyar |
| S1-3 | 11:30am – 12:00pm | Is mental template matching a cultural transmission mechanism in New Caledonian crows?
Dr Alex Taylor |
| S1-4 | 12:00pm – 12:30pm | Who needs a brain? Problem solving and decision making by a giant amoeba
Dr Tanya Latty |

S2: From perception to action: Roles of auditory input in shaping vocal communication and social behaviours P6/P7
Chairperson: Dr Jonathan Prather

- | | | |
|------|-------------------|---|
| S2-1 | 10:30am – 11:00am | Duets in the wild: Interindividually coordinated premotor neural activity enables cooperative behavior in songbirds
Dr Susanne Hoffmann |
|------|-------------------|---|

- S2-2 11:00am – 11:30am Time varying information about the meaning of vocalizations in the avian auditory cortex
Dr Julie Elie
- S2-3 11:30am – 12:00pm Mechanisms for the control of duet singing in plain-tailed wrens
Professor Eric Fortune
- S2-4 12:00pm – 12:30pm Neural mechanisms of song evaluation and mate choice in female songbirds
Dr Jonathan Prather

S3: Neuroethology of distributed visual systems: How do many-eyed animals perceive the world? PLAZA AUDITORIUM
Chairperson: Dr Michael Bok & Dr Daniel Speiser

- S3-1 10:30am – 11:00am Neuroethology of the distributed visual systems of bivalves, chitons, and fan worms
Dr Michael Bok & Dr Daniel Speiser
- S3-2 11:00am – 11:30am From compound eyes to arrays of single eyes in insects
Professor Elke Buschbeck
- S3-3 11:30am – 12:00pm Star-gazing on the reef: can brittle stars 'see'?
Dr Lauren Sumner-Rooney
- S3-4 12:00pm – 12:30pm Gaze control when having plenty of eyes and little brain power
Dr Anders Garm

12:30pm – 2:00pm Lunch EXHIBITION, PLAZA FOYER

12:45pm – 1:45pm Career Development Session P8
Chairpersons: Assistant Professor Sara Wasserman & Dr Gabriella Wolff
Panelists: Professor Daniel Tomsic, Dr Erik Zornik, Dr Eva Fischer and Professor Karen Mesce

Plenary Lecture 2 PLAZA AUDITORIUM
Chairperson: Professor Benny Hochner

- PL2 2:00pm – 3:00pm Odor evoked activity across brain layers: codes, patterns and memories
Professor Giovanni Galizia

3:00pm – 3:30pm Afternoon Tea EXHIBITION, PLAZA FOYER

TUESDAY 17 July 2018

CONCURRENT PARTICIPANT SYMPOSIA

This session is sponsored by



Oral Session 1

PLAZA AUDITORIUM

Chairperson: Dr Emily Baird

- OR1 3:30pm – 3:45pm Parallel and serial visual search modes in the archerfish
Mr Adam Reichenthal
- OR2 3:45pm – 4:00pm Stereo vision and second order motion sensitivity in the praying mantis
Dr Vivek Nityananda
- OR3 4:00pm – 4:15pm Optic flow alters regional visual acuity and attention in flying fruit flies
Dr Jamie Theobald
- OR4 4:15pm – 4:30pm From visual processing in the optic tectum of barn owls to Japanese optical art
Prof Yoram Gutfreund
- OR5 4:30pm – 4:45pm Multiple rod opsin-based vision in deep-sea fishes
Dr Zuzana Musilova
- OR6 4:45pm – 5:00pm Structural, molecular, and functional complexities of the distributed visual systems of chitons
Ms Alexandra Kingston
- OR7 5:00pm – 5:15pm Low resolution vision in a velvet worm (Onychophora), a close relative of arthropods that resembles Cambrian fossils
Dr Miriam Henze
- OR8 5:15pm – 5:30pm The evolution of true colour vision across jumping spiders
Dr David Outomuro

Oral Session 2

P6/P7

Chairperson: Dr Wulfila Gronenberg

- OR9 3:30pm – 3:45pm Neuropeptide F drives attentional gain in the fly brain
Dr Martyna Grabowska
- OR10 3:45pm – 4:00pm Specific octopaminergic neurons arbitrate between perseverance and reward in hungry *Drosophila*
Dr Jean-Francois De Backer
- OR11 4:00pm – 4:15pm The contribution of voltage-gated sodium channels to sensory neuronal excitability during hibernation
Miss Lydia Hoffstaetter

- OR12 4:15pm – 4:30pm Visual surprise promotes sleep in *Drosophila*
Dr Leonie Kirszenblat
- OR13 4:30pm – 4:45pm The organization of projections from olfactory glomeruli onto higher-order neurons in *Drosophila*
Dr James Jeanne
- OR14 4:45pm – 5:00pm In vivo 24-hr whole-brain calcium imaging revealing how *Drosophila* circadian clocks regulate diverse behavioral rhythms
Mr Xitong Liang
- OR15 5:00pm – 5:15pm Perceptual and neural limits of olfactory processing speed in *Drosophila*
Dr Paul Szyszka
- OR16 5:15pm – 5:30pm Neuroarchitecture of the *Drosophila* central complex: A GAL4-Based analysis of nodulus and asymmetrical body neurons
Dr Tanya Wolff

Oral Session 3

P8

Chairperson: Dr Ulrike Siebeck

- OR17 3:30pm – 3:45pm Neural and behavioral responses to communication signals across three apteronotid species: the influence of social group size on chirp discrimination.
Dr Gary Marsat
- OR18 3:45pm – 4:00pm Dynamic circuit activity within a social salience neural network during social bond formation in the monogamous prairie vole
Professor Robert Liu
- OR19 4:00pm – 4:15pm Social status-dependent regulation of the dopaminergic system and regulation of spinal motor circuits in zebrafish (*Danio rerio*)
Dr Fadi Issa
- OR20 4:15pm – 4:30pm Oxytocinergic regulation of adult social behavior in zebrafish: developmental effects and signalling pathways
Professor Rui Oliveira
- OR21 4:30pm – 4:45pm Fluctuations in abundance cause changes in the cognitive performance of cleaner fish *Labroides dimidiatus*
Miss Zegni Triki
- OR22 4:45pm – 5:00pm Neurobiology of pair bonding in fishes: convergence of neural mechanisms across distant vertebrate lineages
Dr Jessica Nowicki

TUESDAY 17 July 2018

PROGRAM - TUESDAY 17 July 2018

OR23 5:00pm – 5:15pm

Numerical cognition in bees

Miss Scarlett Howard

OR24 5:15pm – 5:30pm

Biogenic amine modulation of honey bee sociability and nestmate affiliation

Miss Susie Hewlett

Franz Huber Lecture

PLAZA AUDITORIUM

Chairperson: Dr Paul Katz

FHL 5:30pm – 6:30pm

Thinking like a leech: A neuroethological view of behavioral choice.

Professor Bill Kristan

6:30pm – 7:00pm

Photo Exhibit

PLAZA FOYER



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WEDNESDAY 18 July 2018

PROGRAM - WEDNESDAY 18 July 2018

This session is sponsored by



Queensland Brain Institute

Plenary Lecture 3

Chairperson: Professor Eric Warrant

PLAZA AUDITORIUM

PL3 9:00am – 10:00am Bees, birds and flying machines
Professor Mandyam Srinivasan

10:00am – 10:30am Morning Tea

EXHIBITION, PLAZA FOYER

CONCURRENT INVITED SYMPOSIA

S4: Genomics-enabled approaches to neuroethology

P8

Chairpersons: Dr Jason Gallant, Dr Kim Hoke & Dr Ashlee Rowe

- S4-1 10:30am – 11:00am The genomic basis of communication signal variation in electric fish
Dr Jason Gallant
- S4-2 11:00am – 11:30am Variability, plasticity, and identity of neurons in “simple” behavioral circuits
Dr David Schulz
- S4-3 11:30am – 12:00pm Adaptation to chemical defenses: molecular physiology of sensory-neuron TRP channels
Dr Ashlee Rowe
- S4-4 12:00pm – 12:30pm Cellular and molecular adaptations underlying different frequency regimes in rattlesnake spinal motor systems
Dr Boris Chagnaud

S5: Vocal communication as a model for developmentally-regulated learning: An integrative approach

PLAZA AUDITORIUM

Chairpersons: Dr Sarah Bottjer & Dr Michael Goldstein

- S5-1 10:30am – 11:00am Neurobiological investigation of vocal production learning in the mammalian brain
Professor Michael Yartsev
- S5-2 11:00am – 11:30am Vocal learning via social reinforcement by infant marmoset monkeys
Dr Daniel Takahashi
- S5-3 11:30am – 12:00pm A comparative approach to identifying mechanisms of socially guided vocal learning
Dr Michael Goldstein

S5-4 12:00pm – 12:30pm Cortico-basal ganglia circuits encode performance during goal-directed learning in juvenile songbirds
Dr Sarah Bottjer

S6: Processing the polarization of light

P6/P7

Chairpersons: Professor Nicholas Roberts & Dr Martin How

S6-1 10:30am – 11:00am Horsefly polarotaxis is mediated by a segregated ommatidial subtype with spectrally imbalanced photoreceptors, leading to colour-induced polarization artifacts
Dr Gregor Belusic

S6-2 11:00am – 11:30am Integration of celestial and wind information in the Dung Beetle's compass
Dr Basil El Jundi

S6-3 11:30am – 12:00pm Characterizing the sensitivity of polarization vision in invertebrates using ERGs
Dr Jan Hemmi

S6-4 12:00pm – 12:30pm New directions for studies of how animals use the polarization of light
Professor Nicholas Roberts

2:00pm – 5:30pm

Lone Pine Koala Sanctuary Delegate Tour



THURSDAY 19 July 2018

Plenary Lecture 4 **PLAZA AUDITORIUM**
 Chairperson: Professor Justin Marshall

PL4 9:00am – 10:00am Colour vision, perception and patterns: insights from coral reef fish
Dr Karen Cheney

10:00am – 10:30am **Morning Tea** **EXHIBITION, PLAZA FOYER**

CONCURRENT INVITED SYMPOSIA

S7: Sensory motion strategies **P8**
 Chairpersons: Dr Tobias Kohl & Dr Bart Geurten

S7-1 10:30am – 11:00am Towards a brain architecture for visual behavioral selection in *Drosophila*
Dr Gwyneth Card

S7-2 11:00am – 11:30am Sensory systems influence the locomotion strategy of *Drosophila*
Ms Kristina Corthals

S7-3 11:30am – 12:00pm Saccadic movement strategies in swimming animals
Dr Frederike Hanke

S7-4 12:00pm – 12:30pm How do snakes stabilize the olfactory world? Investigating compensatory tongue and head movements in snakes
Dr Tobias Kohl

S8: The evolution of sleep and adaptive sleeplessness **P6/P7**
 Chairperson: Dr John Lesku

S8-1 10:30am – 11:00am Do all animals sleep?
Dr John Lesku

S8-2 11:00am – 11:30am Sleeping in a society of honey bees
Dr Barrett Klein

S8-3 11:30am – 12:00pm Sleeping with both eyes open: evidence of behavioural sleep in the Port Jackson shark
Mr Michael Kelly

S8-4 12:00pm – 12:30pm First evidence of sleep in flight
Dr Niels Rattenborg

		S9: Context-dependent modification of vocal behaviour in vertebrates	PLAZA AUDITORIUM
		Chairperson: Dr Daniela Vallentin	
S9-1	10:30am – 11:00am	The μ -Opioid receptor system modulates the motivation to sing and acoustic features of female-directed song in zebra finches Mr Sandeep Kumar	
S9-2	11:00am – 11:30am	Neural mechanisms underlying vocal sensorimotor transformations Dr Michael Long	
S9-3	11:30am – 12:00pm	Precise motor control in vocal behaviour of marmoset monkeys Dr Steffen Hage	
S9-4	12:00pm – 12:30pm	Social context-specific vocal communication in <i>Xenopus</i> Dr Darcy Kelley	
12:30pm – 2:00pm		Lunch	EXHIBITION, PLAZA FOYER
		Plenary Lecture 5	PLAZA AUDITORIUM
		Chairperson: Professor Cynthia Moss	
PL5	2:00pm – 3:00pm	From sensory perception to foraging decision making - the bat's point of view Professor Yossi Yovel	
		The Walter Heiligenberg Lecture	PLAZA AUDITORIUM
		Chairperson: Professor Daniel Tomsic	
WHL	3:00pm – 4:00pm	Dominant versus subordinate brains: the establishment and consolidation of hierarchy Associate Professor Ana Silva	
4:00pm – 4:30pm		Afternoon Tea	EXHIBITION, PLAZA FOYER
4:30pm – 6:30pm		Poster Session	P9 – P11 & FOYER

FRIDAY 20 July 2018

Plenary Lecture 6

PLAZA AUDITORIUM

Chairperson: Professor Martin Giurfa

PL6 9:00am – 10:00am Organization of the auditory system in fruit flies
Professor Azusa Kamikouchi

10:00am – 10:30am

Morning Tea

EXHIBITION, PLAZA FOYER

CONCURRENT INVITED SYMPOSIA

This session is sponsored by



**S10: Vision and memory
in crustaceans – neural basis,
function and phylogeny**

P6/P7

Chairperson: Dr Hanne Thoen

- S10-1 10:30am – 11:00am Insights from a formidable companion, the crab *Neohelice granulata*
Dr Julieta Sztarker
- S10-2 11:00am – 11:30am The evolution of crustacean brains and sensory specializations in the midwater hyperiid amphipods
Dr Chan Lin
- S10-3 11:30am – 12:00pm Mushroom bodies and mantis shrimp: Insect-like brain structures in a crustacean
Dr Gabriella Wolff
- S10-4 12:00pm – 12:30pm Divergent evolution of memory centers in malacostracan crustaceans
Professor Nicholas Strausfeld

**S11: Facets of brain mechanisms
underlying spatial orientation**

PLAZA AUDITORIUM

Chairpersons: Mr Jerome Beetz & Professor Uwe Homberg

- S11-1 10:30am – 11:00am Neuroethology of phonotactic orientation in field crickets
Dr Stefan Schoneich
- S11-2 11:00am – 11:30am The role of the central-complex in spatial orientation, locomotion, and prey detection
Dr Anne Wosnitza
- S11-3 11:30am – 12:00pm Acoustic orientation in the dark: About how the brain processes naturalistic echolocation sequences in the fruit-eating bat *Carollia perspicillata*
Mr M. Jerome Beetz

S11-4 12:00pm – 12:30pm Vectorial representation of spatial goals in the hippocampus of bats
Professor Nachum Ulanovsky

S12: What the parts tell us about the whole: Methods and results from automated part tracking P8
 Chairpersons: Dr Roian Egnor & Dr Alice Robie

S12-1 10:30am – 11:00am Using machine vision for automated tracking of body and leg positions in freely walking *Drosophila*
Dr Alice Robie

S12-2 11:00am – 11:30am Motion capture for animal behaviours
Dr Huai-Ti Lin

S12-3 11:30am – 12:00pm High-speed surface reconstruction of flying birds using structured light
Mr Marc Deetjen

S12-4 12:00pm – 12:30pm Comparing centralization of locomotor control in biological, computational, and robotic models
Dr Izaak Neveln

12:30pm – 2:00pm Lunch EXHIBITION, PLAZA FOYER

This session is sponsored by **Plenary Lecture 7** PLAZA AUDITORIUM
 Chairperson: Professor Karin Nordström



PL7 2:00pm – 3:00pm Straighten up and fly right: Using a modern fly to reconstruct behaviors of an ancient world
Professor Michael Dickinson

3:00pm – 3:30pm Afternoon Tea EXHIBITION, PLAZA FOYER

CONCURRENT PARTICIPANT SYMPOSIA

Oral Session 4 PLAZA AUDITORIUM
 Chairperson: Dr Anne von Philipsborn

OR25 3:30pm – 3:45pm Representation of 3D space in the entorhinal cortex of flying bats
Ms Gily Ginosar

FRIDAY 20 July 2018

PROGRAM - FRIDAY 20 July 2018

- OR26 3:45pm – 4:00pm Sound production in decapod crustaceans: behavioral contexts and a newly found role for the circuits of the stomatogastric nervous system
Dr Marie Goeritz
- OR27 4:00pm – 4:15pm Underwater hearing, internally coupled ears (ICE), and sound localization in *Xenopus laevis*
Professor Leo van Hemmen
- OR28 4:15pm – 4:30pm Audio-vocal integration in echolocating bats
Dr Jinhong Luo
- OR29 4:30pm – 4:45pm Neuroethology of sound localization in the pallid bat
Dr Khaleel Razak
- OR30 4:45pm – 5:00pm Neural preparatory activity and sensory feedback independent introductory vocalizations drive initiation of learned song in the male zebra finch
Dr Raghav Rajan
- OR31 5:00pm – 5:15pm Social grouping in caterpillars: proximate mechanisms, from vibroacoustics to sociogenomics
Ms Chanchal Yadav
- OR32 5:15pm – 5:30pm Net-caster neurophysiology: Far-field hearing in a nocturnal spider
Dr Jay Stafstrom

Oral Session 5

P6/P7

Chairperson: Dr Stanley Heinze

- OR33 3:30pm – 3:45pm Space representation in the goldfish brain
Mr Ehud Vinepinksy
- OR34 3:45pm – 4:00pm The Earth's magnetic field and visual landmarks steer migration in a nocturnal moth
Dr David Dreyer
- OR35 4:00pm – 4:15pm Magnetic map navigation requires input from the trigeminal nerve in a migratory songbird
Dr Alexander Pakhomov
- OR36 4:15pm – 4:30pm Spatial navigation in amphibians: Hippocampal encoding of space based on conspecific vocalizations
Miss Maria Ines Sotelo
- OR37 4:30pm – 4:45pm Sensorimotor strategies for robust flight control under large mass changes in the hawk moth, *Manduca sexta*
Dr Simon Sponberg

- OR38 4:45pm – 5:00pm Influence of wide-field motion on the signaling of sky-compass cues in the locust central complex
Ms Uta Pegel
- OR39 5:00pm – 5:15pm Suppression of echolocation in groups of tri-colored bats
Dr Amanda Adams
- OR40 5:15pm – 5:30pm Neural control of dynamic 3-dimensional skin papillae for cuttlefish camouflage
Dr Trevor Wardill

Oral Session 6

P8

Chairperson: Assistant Professor Sara Wasserman

- OR41 3:30pm – 3:45pm The “falcon dive” of a killer fly and other sensorimotor challenges of this miniature visual predator
Dr Paloma T. Gonzalez-Bellido
- OR42 3:45pm – 4:00pm Nested neuronal oscillators orchestrate motor actions across timescales
Mr Harris Kaplan
- OR43 4:00pm – 4:15pm Descending neuron control of flight behavior in *Drosophila*
Dr Wyatt Korff
- OR44 4:15pm – 4:30pm Ballooning spiders: sensory mechanisms and electric flight
Dr Erica Morley
- OR45 4:30pm – 4:45pm Timing, consistency, and redundancy in a comprehensive, spike-resolved flight motor program
Miss Joy Putney
- OR46 4:45pm – 5:00pm How do flies fly? Modelling the flight of fruitflies in a virtual reality arena
Mr Kieran Lawson
- OR47 5:00pm – 5:15pm Backpropagating ectopic action potentials modify information encoding in neurons
Ms Margaret DeMaegd
- OR48 5:15pm – 5:30pm The effect of sensory experience on multisensory integration in the weakly electric fish *Gnathonemus petersii*
Miss Malou Zeymer

5:30pm – 6:30pm

ISN Business Meeting

P6/P7

7:00pm – 10:30pm

ICN 2018 Banquet Dinner

Riverlife

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Posters

Below is a list of the ICN 2018 Congress Posters. Each poster has a unique poster board number. Poster presenters of odd numbered posters will be next to their poster during the poster viewing session on Monday 16 July. Poster presenters of even numbered posters will be next to their poster during the poster viewing session on Thursday 19 July.

Poster sessions sponsored by



Attention & Perception

-
- P001** Satiety-mediated hunting behaviors are affected by insulin in the praying mantis (*Tenodera sinensis*) | **Mr David Bertsch**
-
- P002** The sensorimotor development of naturalistic looking behavior in infants | **Dr Jeremy Borjon**
-
- P003** Auditory and multimodal localization in generalist birds | **Professor Harald Luksch**
-
- P004** Managing distraction: How male courtship displays attract and retain female visual attention in a jumping spider | **Dr Nathan Morehouse**
-
- P005** Bistable visual perception and switching behaviour: Investigating a fundamental brain mechanism with computational biology methods | **Dr Trung T Ngo**
-
- P006** Mapping of auditory stimulation in the frog brain using Mn-enhanced (MEMRI) and resting state (rsMRI) magnetic resonance imaging | **Dr Eva Ringler**
-
- P007** Pheromones modulate responsiveness to a noxious stimulus in honey bees | **Miss Natacha Rossi**
-
- P008** Acute control of the sleep switch in *Drosophila* reveals a role for gap junctions in regulating behavioral responsiveness | **Dr Bruno van Swinderen**

Learning & Memory

-
- P009** Novel operant and classical conditioning paradigms for the cockroach *Periplaneta Americana* | **Mrs Cansu Arican**
-
- P010** Aminergic neuromodulation of associative visual learning in honey bees | **Professor Martin Giurfa**
-
- P011** Color learning by honey bees in virtual reality and in the real world | **Mr Alexis Buatois**
-
- P012** Conditioned inhibition of the phototactic response in honey bees: a novel protocol for the study of aversive learning and memory | **Mr Paul Marchal**
-
- P013** Navigation on the ground and on the tree in the nocturnal bull ant, *Myrmecia midas* | **Professor Ken Cheng**
-
- P014** If you say freeze, I may freeze with you: learning through self-experience determines the meaning of the behavior of others | **Miss Andreia Cruz**

Posters

-
- P015** Gustatory perception and habituation in the moth *Agrotis ipsilon*: modulation by sex pheromones and biogenic amines | **Dr Matthieu Dacher**
-
- P016** Were things different when I left? An experimental and modeling analysis of bumblebees dealing with visual conflict when returning home | **Miss Charlotte Doussot**
-
- P017** Representation of large-scale spaces in the hippocampus of flying bats | **Mr Tamir Eliav**
-
- P018** Effects of early experience on spatial representation of large-scale environments in the bat hippocampus | **Miss Shir Maimon**
-
- P019** The automated flight room: Studying three-dimensional spatial navigation and its underlying neural codes in free-flying bats | **Dr Daria Genzel-Wehrfritz**
-
- P020** Impact of social experience on synaptic density in the mushroom bodies of the paper wasp *Polistes fuscatus* | **Ms Stephanie Hathaway**
-
- P021** Long-term activity-dependent elevation in NO concentration mediates LTP expression and maintenance in the octopus vertical lobe | **Professor Benny Hochner**
-
- P022** Transgenerational effects of stress on song learning | **Miss Fanny-Linn H. Kraft**
-
- P023** Influence of developmental stress on songbird memory formation | **Dr Alizée Meillère**
-
- P024** Extending the T-maze to evaluate socially motivated behavioral profiles in adult zebrafish | **Dr Jagmeet Kanwal**
-
- P025** Distance estimation in a coral reef fish, *Rhinecanthus aculeatus* | **Miss Cecilia Karlsson**
-
- P026** Ducks and Decussation: Long and short term investigations of interhemispheric transfer of visual information in birds | **Dr Antone Martinho**
-
- P027** Long term aversive taste memory in *Drosophila* | **Dr Pavel Masek**
-
- P028** Morphology and function of the hemiellipsoid bodies of the crab *Neohelice granulata*; their role as high-order memory centers | **Mr Francisco Javier Maza**
-
- P029** Dopamine release in mushroom bodies of the honey bee (*Apis mellifera* L.) | **Professor Alison Mercer**
-
- P030** Neuronal correlates of behavioral plasticity in social insect brains - approaching the next level of detail | **Dr Thomas S. Muenz**
-
- P031** Learning walks trigger synaptic plasticity in two visual pathways of *Cataglyphis* ants | **Professor Wolfgang Rössler**
-
- P033** Using selective serotonin reuptake inhibitors (SSRI) to investigate the involvement of 5-HT in reinforcing learning in octopuses | **Dr Nir Neshet**
-
- P034** Discrete gregarising stimuli elicit serotonin release in the metathoracic ganglion of the Desert Locust | **Dr Swidbert Ott**

P035 Mushroom body-like learning and memory centers across Decapoda | **Mr Marcel Sayre**

P036 A naturalistic assay of habituation, discrimination, exploration and avoidance at millisecond precision in head-fixed mice | **Dr Carl Schoonover**

P037 Does the archerfish use motor adaptation to correct for light refraction? | **Ms Svetlana Volotsky**

Audition

P038 Hearing in a chicken brain: how is sound localized in space? | **Mrs Roberta Aralla**

P039 Afferents on hair cells in the foveal region of the barn owl's basilar papilla: Association between terminals and synaptic ribbons | **Professor Christine Koeppl**

P040 Vocalizations as auditory objects: Cues for simultaneous auditory grouping in green treefrogs | **Dr Mark Bee**

P041 Auditory temporary threshold shifts under acoustic stress in zebrafish | **Mr Lukas Breitzler**

P043 Effects of acoustic stimuli on the behaviour of wild and captive shark | **Dr Lucille Chapuis**

P044 Who needs impedance matching? Mechanisms of air-borne hearing in recent and early non-tympanate tetrapods | **Dr Jakob Christensen-Dalsgaard**

P045 Effects of acoustic overstimulation on otoacoustic emissions generated by the amphibian ear | **Dr Ariadna Cobo-Cuan**

P046 Spectral tuning of synaptic inhibition in duration-tuned neurons from the bat auditory midbrain | **Professor Paul Faure**

P047 The Difference a Day Makes: Oviposition Influences Endocrine State and Peripheral Auditory Processing | **Dr Megan Gall**

P048 Articulatory movement associate sound and meaning in human | **Ms Sachi Itagaki**

P049 The auditory world of lizards | **Professor Geoffrey Manley**

P050 Impact of head morphology and natural postures on sound localization cues in crocodylians | **Mr Léo Papet**

P051 Response mode choice in a multimodally duetting paleotropical pseudophylline bushcricket | **Dr Kaveri Rajaraman**

P052 A comparative study of stimulus-specific adaptation in an auditory neuron in Neotropical katydids (Orthoptera: Tettigoniidae) | **Dr Hannah ter Hofstede**

P053 Titrating the effect of low-frequency sound on the mammalian cochlea | **Ms Margarete Ueberfuhr**

P054 Mate or escape: mosquitoes analyze the frequency of sound to make a choice | **Dr Dmitry Vorontsov**

Vocalisation

P055 Midbrain coding of vocal behavior in teleost fish | **Dr Irene Ballagh**

P056 Premotor cortical control of learned and innate vocalizations in interacting zebra finches | **Dr Jonathan Benichov**

P057 Interspecies communication of distance in the rattlesnake acoustic threat display | **Mr Michael J. S. Forsthofer**

P059 Are adult bats capable of vocal imitation? | **Ms Ella Z. Lattenkamp**

P061 Encoding of learned vocalizations in the developing mammalian brain | **Mr Maimon Rose**

P062 Establishing the behavioral, anatomical, and neurophysiological foundations for studying vocal learning in a mammalian model system | **Mr Tobias Schmid**

P063 The neuroethology of bat songs | **Dr Michael Smotherman**

Echolocation

P065 Can sound paint a picture? Biosonar perception of spatial and temporal frequency | **Ms Anne-Leonie Baier**

P066 Acoustic underpinnings of the effectiveness of sonar jamming behavior in *Bertholdia trigona* | **Ms Yohami Fernandez Delgado**

P067 Echolocating bats adaptively change acoustic characteristics of their vocalization depending on time – frequency structures of jamming sounds | **Mr Yosuke Maitani**

P068 Do echolocating bats give a foraging patch to the next bat for optimal foraging? | **Mr Fumiya Hamai**

P069 Bats decrease the similarity of their calls to solve the problem of signal jamming by conspecifics | **Mr Kazuma Hase**

P070 Echolocating bats modulate sonar emission rates based on interaction with other individuals | **Ms Yuki Takeuchi**

P071 Mechanisms of acoustic interference in echolocating bats | **Ms Te Jones**

P072 Communication calls elicit selective neural responses in the inferior colliculus of the big brown bat (*Eptesicus fuscus*) | **Dr Angeles Salles**

P073 An efficient process in the cochlea for the echolocating bats to extract weak echo signals | **Dr Hiroshi Riquimaroux**

P074 Spatiotemporal patterning of perceptual gaze by echolocating bats in densely cluttered scenes | **Mr Amaro Tuninetti**

Electroreception

P075 Blind electric fish in a cave | **Ms Nicole Andanar**

P076 Phase-locking behavior of *Adontosternarchus* is controlled by amplitude information | **Prof Masashi Kawasaki**

P077 Effects of acute and chronic hypoxia exposure on active electric sensing in weakly electric fishes | **Dr Rüdiger Krahe**

P078 Molecular mechanisms of sustained high-frequency firing in the electric organ cells of *Eigenmannia virescens* | **Dr Michael Markham**

P079 Spatial distribution and electric organ discharge rate variations in the sand-dwelling fish *Gymnorhamphichthys rondoni* in a stream in Amazonas, Colombia | **Professor Jorge Alberto Molina Escobar**

P080 Generation of electric charge and electroreception in bumblebees | **Miss Clara Montgomery**

P081 The role of electro-communication in groups of mormyrid weakly electric fish investigated by introducing an electro-communicating dummy fish | **Miss Sarah Pannhausen**

P082 Mechanisms for reading out a latency code in the electrosensory system of mormyrid fish | **Dr Krista Perks**

P083 Circadian and sex-linked differential expression of melanocortin receptor 5 and androgen receptor in the electric organ of *Brachyhyopomus gauderio* | **Dr Vielka Salazar**

P084 How does motor activity affect the sensory information received by *Gnathonemus petersii*? | **Miss Sarah Skeels**

P085 Rapid evolution of a voltage-gated sodium channel gene in a lineage of Electric Fish leads to a persistent sodium current | **Professor Harold Zakon**

Somatosensory Processing

P086 A balance of sensory activity is required for the correct development of the corpus callosum | **Dr Laura Fenlon**

P087 Re-discovering the cephalopod brains using modern technology | **Dr Wen-Sung Chung**

P088 Interspecific differences in somatosensory abilities in waterfowl | **Professor Jeremy Corfield**

P089 Context- and state- dependent activation of a descending interneuron in the stick insect *Carausius morosus* | **Mr Gaetan Lepreux**

Posters

P090 Soft senses: mechanosensing in the body wall of caterpillars | **Professor Barry Trimmer**

P091 Vibrational communication in chameleons: Part II. Behavioral contexts for production of and responses to vibration signals | **Ms Kathryn C Laslie**

P092 Vibrational communication in chameleons: Part I. Specializations for vibration production and detection | **Dr Michael Smith**

Locomotion

P093 The influence of vertical and lateral flying frequencies on odour tracking flying robot | **Mr Bluest Lan**

P094 Free flight behavior of antenna-ablated hawkmoths | **Dr Noriyasu Ando**

P095 The effect of gait variation on path integration in dung beetles | **Dr Emily Baird**

P097 The nervous control of ciliary locomotion in Gastropod Molluscs; neuroanatomy and physiology | **Dr Shaun Cain**

P098 Contextual modulation of escape behavior by multisensory integration in the cricket *Gryllus bimaculatus* | **Mr Matasaburo Fukutomi**

P099 Dynamic gait transition in the centipede, *Scolopendromorpha scolopocryptops rubiginosus* | **Dr Shigeru Kuroda**

P100 Inhibitory reset supports fast locomotion in *C. elegans* | **Dr Gal Haspel**

P101 Comparative morphology of motor control in a lineage of praying mantises | **Dr Joshua Martin**

P102 Aimed limb movements in a hemimetabolous insect are compensated for allometric wing growth | **Dr Tom Matheson**

P103 Locomotor recovery after injury in the medicinal leech: novel proprioceptive pathways correlate with the return of locomotion | **Professor Karen Mesce**

P104 Change in electromyographic patterns after leg amputation in the Cricket | **Dr Dai Owaki**

P106 Computational strategies underlying octopus arm coordination during naturalistic foraging | **Mr Dominic Sivitilli**

Motor Circuits

-
- P107** Interactions between the ventilation and spiracular motor patterns in the locust | **Professor Amir Ayali**
-
- P108** Neurotransmitters and motoneuron contacts of multifunctional and behaviorally specialized turtle spinal cord interneurons | **Dr Ari Berkowitz**
-
- P110** Descending neuron control of Drosophila steering muscles during flight | **Ms Alysha De Souza**
-
- P111** Modulation of crustacean central pattern generators: Is the extent of modulation related to the need for flexibility in movement patterns? | **Professor Patsy S. Dickinson**
-
- P112** Behavioral variation correlates with differences in single neuron 5-HT receptor subtype expression within and across species | **Dr Paul Katz**
-
- P113** Saliva of the Assassin Bug *Platymeris biguttatus* (Reduviidae) rapidly abolishes prey nervous system escape-response without disrupting normal giant fiber activity | **Ms Kristianna Lea**
-
- P114** Neural differences underlying the rapid evolution of fly song | **Dr Joshua Lillvis**
-
- P115** Neural substrates for sensorimotor plasticity to control pecking with an experimentally extended bill in pigeons | **Mr Hiroshi Matsu**
-
- P116** Modular organisation of prey capture behaviour in zebrafish larvae | **Mr Duncan Mearns**
-
- P117** A second complete connectome: the larval CNS of the ascidian *Ciona intestinalis* | **Professor Ian Meinertzhagen**
-
- P118** Unveiling the role of ovipositor extrusion in *D.melanogaster* during courtship | **Dr Cecilia Mezzera**
-
- P119** Fast movements in soft-bodied caterpillars | **Ms Ritwika Mukherjee**
-
- P120** Wing Motor Control in *Drosophila* | **Ms Angela O'Sullivan**
-
- P121** Homologous neurons serve as CPG members in one species and extrinsic neuromodulatory neurons in another species | **Dr Akira Sakurai**
-
- P122** Modulation of the cardiac neuromuscular system of the American lobster, *Homarus americanus*, by differentially processed forms of the neuropeptide myosuppressin | **Ms Meredith Stanhope**
-
- P123** Female *Drosophila* respond to ejaculate with acoustic signals during copulation | **Dr Anne C. Von Philipsborn**
-
- P124** Identifying the neuronal and genetic basis of sex-specific vocal behaviors | **Dr Erik Zornik**

Miscellaneous

-
- P125** Latching mechanisms to generate ultrafast movement of the trap jaw in the ant *Odontomachus kuroiwae* | **Dr Hitoshi Aonuma**
-
- P126** Physiological differences underlying different defensive behaviors | **Miss Natalia Barrios**
-
- P127** Predicting bumblebee trajectories during learning flight | **Dr Olivier Bertrand**
-
- P128** No missed connections: elaboration of a decision-making center in Stomatopoda | **Ms Alice Chou**
-
- P129** Homing in a watery world: path integration and landmark navigation in a mantis shrimp | **Mr Rickesh Patel**
-
- P130** Electrical properties of developing flight muscle | **Ms Jacqueline Clark**
-
- P131** Identifying the molecular mechanisms of tissue metamorphosis | **Ms Naya McCartney**
-
- P132** What in your right mind would make you do that? Ancestry influences acute decisions | **Ms Kimberly Dolphin**
-
- P133** Mammalian brains of different sizes are made of glial cells of similar densities | **Dr Sandra Dos Santos**
-
- P135** Selection for aggression in the Siamese fighting fish changes the brain, not the gonads | **Professor David Goncalves**
-
- P136** Neuropeptides as potential modulators of the behavioral-stage transitions in the desert ant *Cataglyphis noda* | **Mr Jens Habenstein**
-
- P137** The Insect Brain Database - A multi-species platform for comparative insect neuroscience | **Dr Stanley Heinze**
-
- P138** Ultra-small, transparent and genetically modifiable vertebrate brain in *Danio rerio* | **Dr Joerg Henninger**
-
- P139** The backdoor into behaviour: manipulative parasites as a tool for elucidating behavioural mechanisms | **Mr Ryan Herbison**
-
- P140** Differences in nonapeptide neurophenotypes between alternative male morphs in a cichlid fish | **Professor Peter Hurd**
-
- P141** *Drosophila* female senses nutritional states of her mating partner and modulate sperm storage accordingly | **Professor Young-joon Kim**
-
- P142** The change in sensory ecology during the vertebrate water-to-land transition provided a selective advantage for the evolution of planning systems | **Mr Malcolm MacIver**

-
- P143** Waiting for whiskers: Comparative morphology of the trigeminal canal and a sensory scenario for the evolution of mammalian facial muscle | **Miss Juri Miyamae**
-
- P144** The effects of ultrasound neuromodulation on behaviorally relevant neuronal firing patterns | **Ms Morgan Newhoff**
-
- P145** Effect of group size on the stinging responsiveness of honeybees | **Dr Morgane Nouvian**
-
- P146** Vasotocinergic neuronal activation during the establishment of the dominance-subordinate status in a weakly pulse-type electric fish, *Gymnotus omarorum* | **Dr Paula Pouso**
-
- P147** Androgens don't drive me crazy! | **Miss Andreia Ramos**
-
- P149** Brain and behavioural evidence of social cognition in octopus | **Ms Gabriella Scata**
-
- P150** Size or light: what drives neural investment in bull ants? | **Mr Zachary Sheehan**
-
- P151** Changes in behavior and in the retina of cavefishes | **Professor Daphne Soares**
-
- P152** Animal-microbial symbiosis in neuroethology: a hologenomic approach to understanding tetrodotoxin toxicity in rough-skinned newts (*Taricha granulosa*) | **Mr Patric Vaelli**

Other Sensory Systems

-
- P153** Setting the clock: Light and temperature entrainment in *Drosophila* | **Dr Edgar Buhl**
-
- P154** Back to the light: selection on sensory systems in *Drosophila melanogaster* | **Dr Thomas Carle**
-
- P155** Phototactic tails: Evolution and molecular basis of dermal photoreception in sea snakes | **Ms Jenna M. Crowe-Riddell**
-
- P156** Naturalistic stimulation increases high frequency sensitivity in spider mechanosensory neurons | **Dr Andrew French**
-
- P157** Sharing Transducers | **Dr Bart Geurten**
-
- P158** Pain receptor adaptability in an evolutionary arms race | **Ms Lauren Koenig**
-
- P159** Schooling behavior of giant danios altered after lateral line system ablation | **Mr Prasong Mekdara**
-
- P161** Retinal horizontal cells express Cry4: a new take on the avian light-dependent magnetic compass | **Mr Atticus Pinzon-Rodriguez**
-
- P162** Evidence for a dorsoventral visual and tactile sensory complementation for nocturnal foraging in the Band-winged Nightjar (*Systellura longirostris*) | **Mr Juan Esteban Salazar**

P163 Is Piezo protein the mechanotransduction channel in spider *Cupiennius salei* mechanosensilla? | **Dr Paivi H. Torkkeli**

P164 Single Sensory Neurons Encode Haltere Motion | **Ms Alexandra M. Yarger**

Olfaction and Taste

P165 Functional analysis of an inhibitory microcircuit in the *Drosophila* mushroom body calyx | **Dr Martin F Brill**

P166 Neurobiological indicators of olfactory sensitivity in cartilaginous and bony fishes | **Ms Victoria Camilleri-Asch**

P167 Chemosensory pathways in Amblypygids (whip spiders) | **Dr Wulfila Gronenberg**

P170 Pheromone utilisation in elasmobranchs | **Miss Heather Middleton**

P171 Multiple sensory organs employ active ciliary-driven suction in nudibranch gastropods | **Professor James Murray**

P172 Experience- and context-dependent modulation of aggression behavior in ants | **Ms Stefanie Neupert**

P173 Neural representation of spatial odour perception in the American cockroach | **Dr Marco Paoli**

P174 Fruit flies use stimulus onset asynchrony for odour source separation | **Miss Aarti Sehdev**

P175 Mechanisms enabling better discrimination of transients can cause decorrelation in the antennal lobe | **Miss Bhavana Penmetcha**

P176 Male African clawed frogs show olfactory responses to socially-relevant stimuli | **Dr Heather Rhodes**

P177 Sensory mechanisms for localizing spermatophores in the axolotl (*Ambystoma mexicanum*), an aquatic salamander | **Miss Taylor Rupp**

P178 Disparate wiring principles in the air- and water-smelling regions of an amphibian olfactory system | **Mr Lukas Weiss**

P179 Neuroethology of chemosensory-based navigation behaviour in the aquatic gastropods *Tritonia* and *Lymnaea* | **Dr Russell Wyeth**

Ecology

P180 Habitat light intensity and the color of *Anolis* dewlaps | **Dr Leo Fleishman**

P181 Testing the acoustic niche hypothesis in a seasonally changing tropical bird assemblage | **Dr Anand Krishnan**

P182 Quantifying environmental constraints on the signaling strategies of Australia's dragons | **Dr Richard Peters**

P183 Evidence for differential aromatase gene promoter methylation in a cichlid with pH-influenced sex determination | **Dr Suzy Renn**

P184 How efficient neural processing influences mimicry, mate choice and aesthetics in animals? | **Dr Julien Renoult**

P185 Visual approach computation in feeding hoverflies | **Mrs Malin Thyselius**

Computational Modelling

P186 Tracking wakefulness transitions in *Drosophila* | **Mr Sridhar R Jagannathan**

P187 Modeling visual perception, learning, and memory of ants navigating in naturalistic environments | **Dr David Lent**

P188 From shark brains to human cerebellum: an evolutionary perspective on pattern formation in the cerebellar granule cell layer | **Professor John Montgomery**

P189 Neural models of ant navigation in a realistic 3D world | **Miss Daniela Pacella**

P190 A model of the central complex circuit supports path integration during sideways drift and vector addition for novel shortcuts | **Prof Barbara Webb**

Neuronal Development

P191 Sex and caste-specific neuroplasticity in ants | **Mr Duncan Jaroslow**

P192 Using marsupials to investigate calcium activity in the developing cortex in vivo | **Dr Rodrigo Suarez**

P193 Comparative transcriptomics of neocortical development in marsupials and eutherians | **Dr Peter Kozulin**

P194 Body pattern changes and neural connectivity of a reef cuttlefish across the lifespan | **Ms Alejandra Lopez Galan**

Vision

P200 The Evolution of Eye Loss in parasitic bat flies (Streblidae and Nycteribiidae) | **Dr Megan Porter**

P201 Opsin genes: adaptations to different light environments in West African crater lake cichlids | **Ms Monika Klodawska**

P202 Now you see me, now you don't: Evolution of the visual sensory system in deep-sea fishes from the Sargasso Sea | **Mr Nik Lupse**

Posters

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- P203** FISHing for Opsins: Photoreceptor distribution in the retina of the Cameroonian Crater Lake Cichlid Fishes | **Ms Katerina Remisova**
-
- P204** Molecular evolution of vision in the elephant fishes (Mormyridae) | **Ms Gina Sommer**
-
- P205** Visual system and developmental plasticity of European cyprinid fishes from subfamily Leuciscinae | **Ms Veronika Truhlarova**
-
- P206** Rapid evolution of vision in Sea Snakes | **Dr Bruno Simões**
-
- P207** FoxP in bees – from molecules to circuits. Indication for a role in visual processing | **Ms Adriana Schatton**
-
- P208** Ommatidial type-specific intra- and inter-cartridge connections in the Papilio lamina revealed by serial block face-scanning electron microscopy (SBF-SEM) | **Professor Kentaro Arikawa**
-
- P209** Examination of the histamine hypothesis for a mechanism underlying photoreceptor spectral opponency in the Papilio butterfly | **Ms Pei-Ju Chen**
-
- P210** The retinal organisation of a migratory butterfly, *Parantica sita* | **Dr Nicolas Nagloo**
-
- P211** A novel method for estimating spatial resolution in compound eyes | **Dr Zahra Bagheri**
-
- P212** Spectral sensitivity of the fiddler crab *Uca dampieri* | **Miss Anna-lee Jessop**
-
- P213** Crustacean vision: adaptable eyes for extreme changes in light | **Miss Emelie Brodrick**
-
- P214** Polarization sensitivity of ocelli in Australian bull ants | **Dr Yuri Ogawa**
-
- P217** Visual processing in the most complex visual system: In vivo intracellular recordings of interneurons in stomatopod | **Ms Jing Wen Wang**
-
- P218** Characteristics of visual interneurons of a mantis shrimp *Haptosquilla pulchella* | **Mr Tsy-r-huei Chiou**
-
- P219** Using gene-editing and behavioural ecology to unravel the function of single and double cones in reef fish vision | **Mr Laurie Mitchell**
-
- P220** Polarization vision for underwater navigation | **Dr Samuel Powell**
-
- P221** Neural organization of the lamina of mantis shrimp | **Ms Amy Streets**
-
- P222** Vision and bioluminescence: the evolution of light detection in ocular and bioluminescent organs in deep-sea crustaceans | **Mr Tom Iwanicki**
-
- P223** Switching from stochastic to deterministic patterning in fly retinas: mechanisms and behavioral significance | **Dr Fleur Lehardt**
-
- P224** Do miniaturization and diurnality account for retinal specializations in the eyes of pumpkin toadlets (Anura: Brachycephalidae)? | **Dr Carola Yovanovich**

-
- P225** The when and where of stomatopod visual decision-making: advances towards understanding the neuroanatomy and electrophysiology of Pancrustacean brains | **Dr Nicolas Lessios**
-
- P226** How differences in experimental designs can yield support or refutation of the receptor noise model predictions about colour discrimination | **Ms Adélaïde Sibeaux**
-
- P227** High resolution of colour vision, but low contrast sensitivity in a diurnal raptor | **Dr Simon Potier**
-
- P228** Signal or cue: the role of structural colouration in flower evolution | **Professor Adrian Dyer**
-
- P229** Context-dependent continuous colour discrimination functions help bees to cope with naturally occurring perceptual noise | **Dr Jair Garcia**
-
- P230** From genotype to phenotype for color-based mate choice preferences in Heliconius butterflies | **Mr Nathan Buerkle**
-
- P231** Shifting cichlid color vision: the role of Tbx2a in LWS opsin gene regulation | **Dr Ben Sandkam**
-
- P232** Visual communication in cichlid fishes: Do visual sensitivities drive color signals or do color signals drive visual sensitivities | **Professor Karen Carleton**
-
- P233** Cichlid color vision and its limits | **Mr Daniel Escobar-camacho**
-
- P234** Simultaneous spectral stimulation and two-photon neural activity imaging in a Drosophila colour processing neuropile, the medulla | **Miss Rachael Feord**
-
- P235** Spectral sensitivity of Drosophila melanogaster colour receptors | **Dr Camilla Sharkey**
-
- P236** The use of spectral cues for orientation in the monarch butterfly Danaus plexippus | **Ms Myriam Franzke**
-
- P237** Psychophysics of the dronefly Eristalis tenax L.: Evidence of sigmoidal colour discrimination capabilities in an important Dipteran pollinator | **Ms Lea Hannah**
-
- P238** How seeing red influences food detection: visual ecology in damselfish (Pomacentridae) | **Ms Vivien Rothenberger**
-
- P239** Quantitative Colour Pattern Analysis (QCPA): A novel approach for the study of animal colour patterns | **Mr Cedric van den Berg**
-
- P240** Does variation in background hue and saturation (chromatic noise) influence colour discrimination? | **Ms Naomi Green**
-
- P241** Anatomical evidence for ultraviolet vision in larval stomatopod crustaceans | **Ms Marisa McDonald**
-

Posters

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- P242** A model explaining the colour interaction in the receptive fields of the ganglion cells in the goldfish retina | **Dr Paul Maximov**
-
- P243** Fluorescence emission from photonic structures in beetles' elytra | **Dr Sébastien R. Mouchet**
-
- P244** How to be camouflaged against multiple visual backgrounds | **Professor Martin Stevens**
-
- P246** Limits for a beetle using polarized light in the dark-a psychophysical study | **Dr James Foster**
-
- P247** First-order ocellar interneurons in the posterior protocerebrum of the night-active bee *Megalopta* | **Dr Anna Honkanen**
-
- P248** Action in dim light: vision and visual navigation of nocturnal ants | **Dr Ajay Narendra**
-
- P249** Optimising vision in twilight conditions: photoreceptor transmutation in the deep-sea pearlside | **Dr Fanny de Busserolles**
-
- P250** Behavioural adaptation to light deprivation | **Ms Kristina Corthals**
-
- P251** Active photolocation in diurnal fishes: Can they see more by redirecting downwelling light? | **Professor Nico K. Michiels**
-
- P252** Daytime eyeshine contributes to pupil camouflage in a cryptobenthic marine fish | **Mr Matteo Santon**
-
- P253** Single object resolution in budgerigars (*melopsittacus undulatus*) | **Ms Sandra Chaib**
-
- P254** Frequency tagging identifies selectively attended target in a dragonfly visual neuron | **Mr Benjamin Lancer**
-
- P255** Specialised vision, target selection and control in a miniature Robberfly | **Mr Samuel Timothy Fabian**
-
- P256** A Robber Fly with similar gleaning habits, but very different eyes to Damselflies | **Mr Sergio Rossoni**
-
- P257** Binocular facilitation in Damselfly target selective descending neurons | **Mr Jack Supple**
-
- P258** A case of mistaken identity? Linking attack behaviour and visual perception in sharks | **Dr Laura Ryan**
-
- P259** Neuronal pathways of the lateral protocerebrum of mantis shrimps | **Miss Hong Diem Vo**
-
- P260** Changes in the velocity of an approaching object are tracked by a locust motion-sensitive visual interneuron | **Dr Jack Gray**

-
- P261** Seeing the world in a different light – visual processing of intensity and polarization to enhance target detection | **Mr Sam Smithers**
-
- P262** Visual priming within a modular visual system | **Dr Ximena Nelson**
-
- P263** Coding schemes in the Archerfish optic tectum | **Professor Ronen Segev**
-
- P264** Visual circuits underlying the prey capture strike in zebrafish larvae | **Professor Julie Semmelhack**
-
- P265** A cholinergic pesticide impairs contrast sensitivity and direction tuning in hoverfly motion detecting neurons | **Dr Elisa Rigosi**
-
- P266** Differential adaptation to visual motion allows robust encoding of optic flow in the dragonfly | **Dr Steven Wiederman**
-
- P267** Neural summation improves motion vision in small fruit flies | **Mr John Currea**
-
- P268** Systematic identification of neurons in the brain of *Drosophila* – Neurons with projections in posterior neuropils to ocellar ganglion interneurons | **Dr Jens Goldammer**
-
- P269** The dominant role of visual motion cues in bumblebee flight control revealed through virtual reality | **Dr Elisa Frasnelli**
-
- P270** Response of a locust motion sensitive neuron, flight muscle activity and wing asymmetry during flight steering | **Mr Cody Manchester**
-
- P271** Visual motion detection and collision avoidance behaviours are disrupted by a neonicotinoid insecticide and its metabolites in *Locusta migratoria* | **Ms Rachel Parkinson**
-
- P272** The response properties of visual interneurons in the mantis unravel the functional organization of the lobula complex | **Dr Yoshifumi Yamawaki**
-
- P273** Adaptation in the visual motion pathway shapes representation of optic flow in aerial insects | **Dr Oliver Bertrand**
-
- P274** Responses to visual motion stimuli of lobula giant neurons from a crab assessed by multielectrode recording | **Professor Daniel Tomsic**
-
- P275** OFF pathway specializations in the *Drosophila* visual system | **Miss Katja Sporar**
-
- P276** Making sense of directions: The complete set of input cells to the upper division of the central body in bees | **Miss Josiane Da Silva Freitas**
-
- P277** The Bogong moth: A new model for visually-guided long-distance navigation | **Miss Andrea Adden**
-
- P278** Phototactic flight of the chestnut tiger butterfly is based on the dorsal eye region | **Dr Michiyo Kinoshita**
-

Posters

-
- P279** Correlation between stimulus information and escape behaviour in fiddler crabs | **Mr Callum G Donohue**
-
- P280** Human and conspecific face discrimination abilities of cats and dogs: learning, recall, and preferences | **Professor Stephen Lomber**
-
- P281** Paying attention to polarization: What cues do mantis shrimp learn most quickly? | **Dr Martin How**
-
- P282** Miniaturisation in ants affects their vision and visual navigation | **Mr Ravindra Palavalli Nettimi**
-
- P283** Visual navigation in ants: what is the function of the mushroom body? | **Dr J. Frances Kamhi**
-
- P284** The long and short of it: Spatial cognition of detours to prey by jumping spiders | **Dr Cole Gilbert**
-
- P285** Neural basis of sun compass navigation in *Drosophila* | **Dr Ysabel Giraldo**
-
- P286** Visual acuity and behavioral camouflage in the flying snake (*Chrysopelea*) | **Dr Sharri Zamore**
-
- P287** A vision-based system for avoiding mid-air collisions | **Mr Dasun Gunasinghe**
-
- P288** Budgerigar flight: Guidance laws for avoiding mid-air collisions | **Mr Debajyoti Karmaker**
-
- P289** Flying in a 'bee cloud': Mid-air collision avoidance strategies | **Mr Mahadeeswara Mandiyam**
-
- P290** Habituation to looming stimuli in zebrafish larvae | **Mr Emmanuel Marquez Legorreta**
-
- P291** Face recognition in fish | **Dr Ulrike Siebeck**
-
- P292** How Dory finds her friends | **Dr Fabio Cortesi**
-
- P293** Seeing on the reef: the visual ecology of the spotted unicornfish (*Naso brevirostris*) | **Mr Valerio Tettamanti**
-
- P294** Diversity of visuomotor reflexes seen in two *drosophila* species | **Dr Sara Wasserman**
-
- P295** Mapping the natural visual world of the zebrafish (*Danio rerio*) | **Ms Noora Nevala**
-
- P296** On the role of the visual and vestibular systems in stabilising perching in zebra finches | **Ms Natalia Perez-Campanero**
-
- P297** Honeybees choose their way to home using e-vector information from the sky | **Dr Midori Sakura**
-



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THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

Create change

Congress Banquet (directions to venue)

RIVERLIFE VENUE LOCATION

Riverlife's unique venues are located at the bottom of the Kangaroo Point Cliffs, Brisbane.

Please note: Due to our intimate and secluded location we recommend all guests attending the function leave enough time to find parking and time for a short stroll to our venues.

Please refer to the various transport options that are available to you overpage.

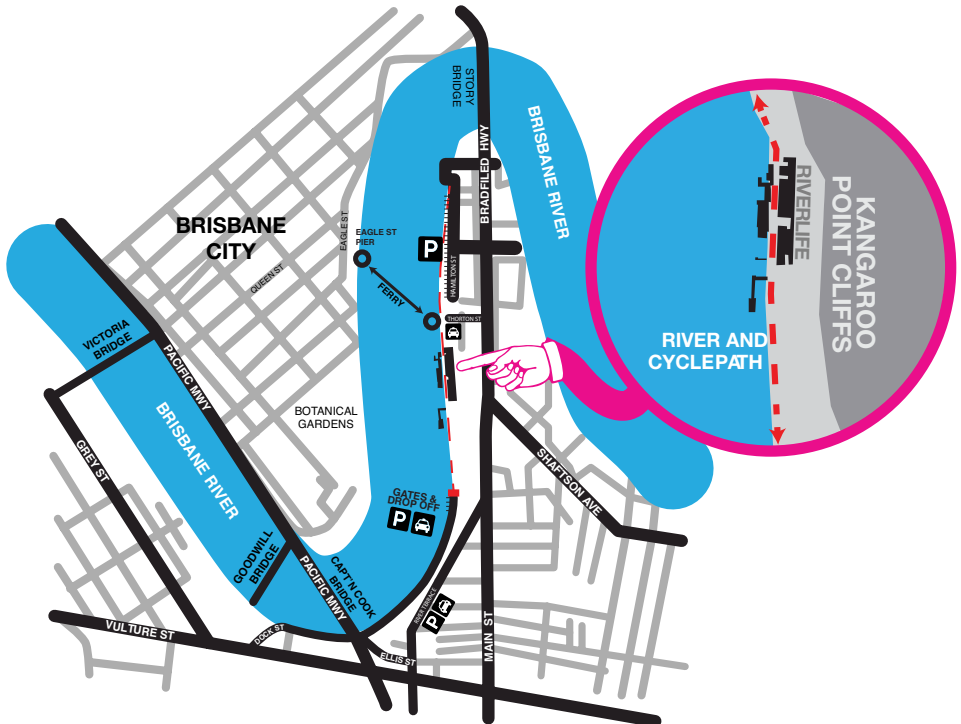
 Kangaroo Point river & cycle path



Taxi drop off



Public parking



TRANSPORT OPTIONS

BY CAR (PARKING)

- Please note, there is no on-site parking at Riverlife.

RIVER TERRACE – Park at the top of the Kangaroo Point Cliffs next to 'The Cliffs Cafe', walk down the cliff stairs, turn right and walk 300m to Riverlife.

VIA ELLIS STREET– Continue driving down towards the river and turn right under the Pacific Motorway (Captain Cook Bridge), park or drop off, in the free public car park at the base of the Kangaroo Point Cliffs. Then walk, following the Riverlife signs along the river and cycle path, a distance of 800m (limited parking – good for drop off).

VIA DOCK STREET – Continue to drive under the Pacific Motorway (Captain Cook Bridge), park or drop off, in the free public car park at the base of the Kangaroo Point Cliffs. Then walk, following the Riverlife signs along the river and cycle path, a distance of 800m (limited parking – good for drop off).

HAMILTON STREET (OFF BRIGHT STREET) – Take a short 350m walk along the river and cycle path towards the Kangaroo Point Cliffs.

DISABLED ACCESS – All disabled guests have direct access to Riverlife. This is available upon request only. Via Ellis Street or Dock Street.

TAXI

Catch a taxi to Thornton Street, walk down to the Thornton Street Ferry Terminal, turn left and follow the Riverlife signs. Riverlife is 300m from the Thornton Street ferry terminal.

Taxi's can also drop off or pick up via Ellis, Dock Street or River Terrace (directions above).

*Taxi pick up is recommended at Thornton Street.

CITY FERRY

Catch the Thornton Street ferry from Eagle Street Pier. Turn right when you get off the ferry and follow the Riverlife signs. Riverlife is 300m from the Thornton Street Ferry Terminal.

TRAIN

Take any train to South Bank Station. Riverlife is a 2km walk along the river from the station in the direction of the Kangaroo Point Cliffs.

WALK FROM THE CITY

Walk over the Goodwill Bridge, turn left and follow the river to Riverlife.

PUBLIC BUS

Take any Brisbane City Council bus to the South Bank Busway Station. Riverlife is a 2km walk along the river from the bus station in the direction of the Kangaroo Point Cliffs.

BEAUTIFUL ONE DAY, PERFECT THE NEXT

Queensland

AUSTRALIA

DISCOVER BRISBANE

Brisbane is the quintessential Queensland city: understated, unpretentious and with a welcoming, laidback vibe that flips the traditional city experience on its head. World-class cultural precincts and award-winning dining experiences combine with buzzing after-dark and music scenes, breathtaking island escapes, stunning national parks and paddock to plate experiences. From the city centre, embrace the outdoor lifestyle and sip cocktails up on the rooftops or dine riverside with the iconic Story Bridge as your backdrop. Discover up-and-coming artists at an underground bar or get your cultural fix at the Gallery of Modern Art. Satisfy your wanderlust and explore the lush surrounding hinterland or endless sandy beaches of Moreton and North Stradbroke Islands.

REGION'S MUST DOS

- Get up close and personal with the native wildlife at Lone Pine Koala Sanctuary.
- Dine against a backdrop of twinkling city lights and gentle river breezes at Eagle Street Pier, Brisbane's iconic riverside restaurant precinct.
- Head to the thriving riverside cultural precinct of South Bank. Channel your inner art critic at Australia's largest Gallery of Modern Art or snap up seats to a show at Queensland Performing Arts Centre.
- Treat yourself to some retail therapy among the designer boutiques and international brands of the Queen Street Mall, Queensland's premier shopping destination.
- Experience the thrill of a live sports match at Suncorp Stadium and join in the post-game revelry on legendary Caxton Street.
- See Brisbane from a new perspective: explore the Brisbane River by kayak or scale the Story Bridge and drink in the spectacular city views.
- Treat your tastebuds to some phenomenal street food at Eat Street. Brisbane's quirkily-styled, shipping container market serves up eclectic, authentic dishes from all corners of the globe.
- Raise your glass with local 'brewmasters' on a beer tour of Newstead, birthplace of the city's emerging boutique brewery scene.
- Get back to nature on Moreton Island. Hand-feed wild dolphins, toboggan down giant sand dunes and kayak around the famous Tangalooma wrecks while keeping your eyes peeled for whales and dugongs.



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