



International Society for Neuroethology

Newsletter/February 2015

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Don't forget to renew your ISN membership!



Warmest greetings for a healthy & productive 2015 from the ISN President Peter Narins.

The Prez Says

Peter Narins
President of the ISN

Dear ISN Members,

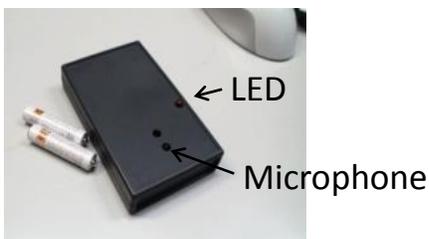
First, a very happy new year's greeting to all of you. By the time you read this column, about 10% of 2015 will be past and many of us in the Northern Hemisphere will be making plans for traveling during our summer months of June through August. In addition, we will all

be contemplating our plans to travel to the Southern Hemisphere during their spring months of March-April, 2016, to attend **ICN2016** in Montevideo.



Prof. K. Aihara (l.) and Dr. I. Aihara

There is no question that our discipline is alive and flourishing. Last December, I participated in an **International Workshop on Neuroethology** at the **University of Tokyo**. The meeting was organized by **Ikkyu Aihara** from **Doshisha University** (photo), and **Timothee Leleu** and **Gouhei Tanaka**, also from the University of Tokyo, and co-organized by **Professor Kazuyuki Aihara** (photo) from the **Research Group on Industrial Mathematics, IIS, at the University of Tokyo**. The talks centered on two important vertebrate neuroethological models – bats and frogs. **Hirimitsu Awano's** elegant response to his own rhetorical question *Why frogs?* was especially memorable: *They are simple but profound*. A novel development presented at the workshop was a device called the *firefly*, developed by **T. Mizumoto, I. Aihara, and H. Awano**. This device is packaged in a plastic box the size of a pack of cigarettes, containing a microphone, a battery-powered amplifier and filter, and an LED.



The firefly, designed specifically for frog chorus analysis

Dozens of *fireflies* are deployed throughout a frog chorus, and the LEDs glow when stimulated by a nearby calling male frog. The array of LEDs is captured on low-light video. Image processing of the resulting light patterns reveals detailed information about caller positions and call timing. Moreover, when a small LED is placed on a female that enters the area of calling males, the details of

her trajectory and her *choice point* within the chorus can be visualized. This level of analysis of female movements within a frog chorus had not been possible previously, and these researchers are planning more sophisticated *fireflies* for future use.

The next **Gordon Research Seminar (GRS)** will take place in **Lucca, Tuscany, Italy** from **June 27-28, 2015**. The **GRS on Neuroethology: Behavior, Evolution & Neurobiology**, titled *In the Light of Evolution: Technology and the Evolutionary Approach*, will offer a unique forum for graduate students, post-docs, and other scientists with comparable levels of research experience and education to present and exchange new data and cutting edge ideas. Although applications will be accepted through **May 30, 2015**, any applicants who wish to be considered for an oral presentation should submit their application by **March 27, 2015**.

Immediately following the GRS in the same venue will be the 2015 **Gordon Research Conference (GRC)** titled *The Future Is Now: Innovative Concepts in Neuroethology and New Technologies*, from **June 28-July 3**. Applications for this meeting must be submitted online by **May 31, 2015**, but earlier applications are strongly encouraged. To quote from the GRC website: *An outstanding and internationally renowned cast of speakers has been selected whose cutting-edge research spans fields in neurobiology (genes, circuits, development, behavior, and evolution), ecology, engineering, and computer-based systems. Individual sessions are designed so that the body of presentations will showcase how biological solutions inform new conceptual and technological advances, and vice versa. Such examples will be drawn, in part, from research in the areas of bio-inspired robotics, smart machines, and computational modeling. The meeting's highly collegial and interactive nature will stimulate lively discussions and the sharing of diverse perspectives, potentially fostering new interdisciplinary research collaborations. In addition to formal talks and discussion sessions, all participants are encouraged to present their research in the form of poster presentations.* For additional information regarding these two exceptional neuroethological meetings, visit the GRC website: <https://www.grc.org/meetings.aspx>.

In more news, the newly formed **Program Committee (Martin Giurfa and Jose Luis Peña, Co-Chairs)** has issued the **Call for Symposia** for **ICN2016** in **Montevideo, Uruguay**. This announcement can be accessed on the ISN website under the Meetings tab. Please be thinking about possible symposia for the next meeting – we all have heard excellent speakers whose work is cutting edge but perhaps not perceived to be at the

center of current neuroethological thought. But if the work is novel and engaging, it can often stimulate new connections as well as unforeseen collaborations. Let's think outside the box for some of these symposia – why not? We may gain some new members in the process by means of inclusive invitations to speakers. This thought is pertinent to my next topic.

One of the pledges I made when running for ISN office was that I would like to see our society through a growth phase during which we increase both our student as well as our regular membership. I believe this can be accomplished by appointing a membership chairperson (currently a work in progress), contacting specific people who are doing neuroethological research but who are not yet ISN members, and by advertising the ISN at the annual meeting of the Society for Neuroscience (SfN), for example, which was done at the last SfN. Woefully, there are presently 377 past members who have let their ISN membership lapse. Some of these have changed fields or have left science, but many have simply dropped the ball because of other commitments, or simply are too busy to renew. Those on the list will be receiving renewal reminders this month and I urge all of those lapsed members to come back to your society, to tell your students and colleagues about us, and especially to remind them of the upcoming meetings in Italy, Uruguay and Australia to which all are invited. We need a proactive, concerned and engaged membership to keep the ISN vibrant!

As always, your Executive Committee is interested in your ideas and thoughts on how to improve the society. What should ISN be doing that we're not doing now, or not doing well enough? Are there areas of neuroethology that deserve more (or less) emphasis? What trends do you see that we may be overlooking? Let me know!

All the best to all of you and until next time, remember – **Mark Twain** defined an expert as someone who knows no more than you do, but is from out of town.

With best wishes,

Peter



The 2016 Congress will be held in Montevideo, Uruguay, March 29 through April 3, 2016, at the Radisson Montevideo Victoria Plaza Hotel.

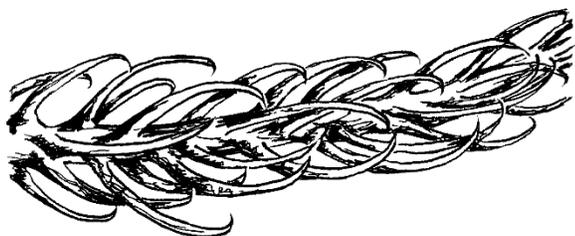
A VISUAL GUIDE TO THE LUND SENSORY ECOLOGY SHORT COURSE

Kate Feller used a Heiligenberg Travel Award to attend the 2014 Lund Sensory Ecology Short Course. Here she shares her experiences in Lund using an extremely creative format that features her own drawings. Kate is a recent Ph.D. out of the Cronin lab at the University of Maryland Baltimore County. She currently serves as an Early Career Representative on the ISN Council. As will be clear as you continue to read, Kate is interested in both visual research and the visual arts.

If you are a graduate student looking to broaden your understanding of sensory ecology or even a new postdoc looking to diversify your knowledge of the how animals gather information from their environment, then you should seriously consider taking the Lund sensory ecology short course for international postgraduates. Offered every two years, this 14-day course takes place on the **Lund University** campus located in the historic town of Lund, Sweden just a hop across the sound from Copenhagen. Each day is packed with lectures delivered by multiple, internationally renowned experts of each sensory field. The current format of the course also involves two field trips: an afternoon excursion and tour of the field station serving the Lund Department of Biology at Stensöffa as well as a day trip to the bird ringing station at Falsterbo peninsula. Tours of the visual and chemical ecology laboratories as well as the gargantuan Lund wind tunnel are also included in the two-week experience. As if all that wasn't enough to stimulate the mind of an early-career sensory ecologist, an additional six hours are allotted throughout the first week for students to present posters of their own work to their

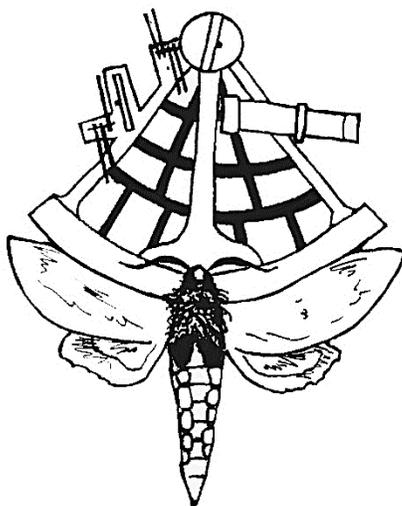
peers, visiting lecturers, and any sensory ecologists residing in Lund.

As a member of the 2014 class, I can easily claim this as one of the greatest educational and networking experiences of my graduate student career. As a visual ecologist, I have a strong bias towards visual communication. Thus, I thought it best to present some highlights from my participation in the course this fall via a series of cartoons inspired by several of the lectures.



TRICHOBOTHRIA

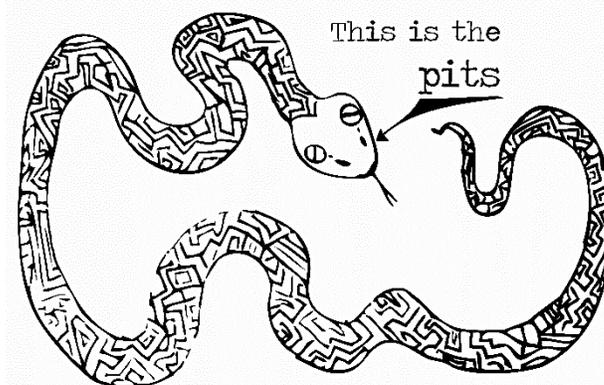
In a lecture on mechanosensation by **Friedrich Barth** (University of Vienna, Austria) I learned the best vocabulary word of 2014: trichobothria. These exquisite mechanoreceptor organs are found on the cuticle of the American wandering spider, *Cupiennius solei*. With a low mass and high area, each trichobothrium, or hair sensillum, is tuned to detect minute changes in air flow. They are so finely tuned that these spiders can accurately judge the distance of a moving object for prey capture, without the use of their eyes!



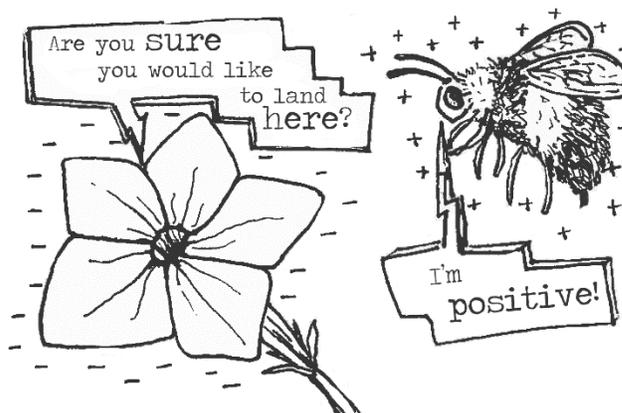
Manduca sextant

This is a tribute to the classic model organism, *Manduca sexta*, and a classic navigational instrument, the sextant. *M. sexta* provides an excellent model for studying insect navigation, not just for vision but also chemosensation. After delivering an engaging lecture on *Manduca* and other insect orientations to odors, **Mark Willis** (Case Western Reserve University, USA) led the class in a fun,

human-based “field” experiment that involved obstructing the visual, auditory, and tactile sensory inputs of volunteers and observing if they can use only their nose to track a spearmint scented string scent trail laid in the grass. The results suggest that the task is harder than it seems!



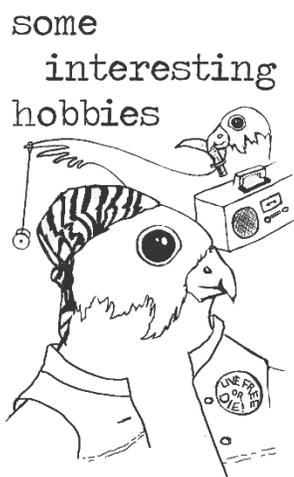
This cartoon illustrates the location of one of the most bizarre and fascinating sense organs – the pits of a viper! These thermosensitive organs provide “thermal vision,” evidenced by spatiotopic projections from the pit to the visual map centers of the brain. With his dynamic lecture, **Aaron Krochmal** (Washington College, USA) walked the class through not just how this unusual structure works, but how to go about designing a research program aimed at elucidating the function of an unknown structure, such as a pit on the face of a poisonous snake.



Perhaps you doubt that electro-sensation is real. But even the most skeptical scientist is likely to concede any uncertainty after hearing a lecture on the subject by **Daniel Robert** (University of Bristol, UK). Robert provides data from rigorous experimentation that leads inexorably to a conclusion of *Yes! Bees are able to detect the electrical charge of a flower!* This is certainly a novel concept for sensory ecology.

While it’s amusing to think of *some interesting hobbies* as falcons showing off their eclectic leisure activities, Eurasian Hobbies are in fact an interesting animal even

without taking their hobbies into account. From a lecture by **Thomas Alerstam** (University of Lund, Sweden) on bird migration, we learned that recent satellite tracking data of these falcons (typically found throughout most of Europe) demonstrate that a Hobby's winter migration can include distances of up to 10,000 km to regions as far south as Southern Angola and Zimbabwe. Such incredible migration themes and the senses that drive these behaviors were also highlighted in lectures by **Ken Lohmann** (University of North Carolina, USA), **Gabrielle Nevitt** (UC Davis, USA), **Susanne Akesson** (University of Lund, Sweden), as well as witnessed first-hand during the field trip to the bird ringing station where an unceasing stream of passerines passed over our heads on their mass migration south, over the Falsterbo peninsula and across the Baltic Sea.



To learn more about becoming a member of the 2016 Lund Sensory Ecology course, please visit the course website: <http://www.biology.lu.se/education/courses/phd-courses/sensory-ecology>. Enrollment is limited, so make sure to apply early! Then, if accepted, consider applying for a Heiligenberg Student Travel Award to defray some of your expenses.



DEAR GABBY...

You, young and not-so-young neuroethologists, have questions. Our very own neuroethology advice guru, Gabriella Wolff, has answers from experts.

Dear Gabby,

As a young neuroethologist, I'm trying to get independent funding, but am not sure where to start. I work on a non-genetic model organism and am concerned about really

selling my proposal idea. My project is AWESOME, but how do I convey that to a grant reviewer? Please, please advise!

Signed,

Enthusiastic but hungry

Dear Enthusiastic Neuroethologist,

For an early career scientist, it is never too early to apply for personal funding. In some cases, research fellowships can be awarded as early as the undergraduate level, and once you begin to list awards on your CV, you will become more competitive in future applications. Funding begets more funding! Although there are many funding opportunities, I can personally speak to my experience writing a successful application to the **National Science Foundation Graduate Research Fellowship** (NSF GRFP) in the United States. These principles apply to many types of applications. First, in any personal statement or proposal, grab the reviewer's attention in the very first line. The research must be immediately intriguing, but also based on a solid hypothesis with clear and feasible aims. Also, tell a story and make it personal. For example, I explained that I grew up in the New York countryside and once lived in a sculpture, fostering an aesthetical appreciation of nature that inspired my pursuits in biology. Reviewers remember these personal details more readily than a sterile chronology of lab experiences. Finally, never miss an opportunity to do outreach, whether it be volunteering for a science fair or giving a public lecture on your favorite organism. This fits under the criterion of *Broader Impacts*, which funding agencies such as the NSF take very seriously.

If the US is not your home country, do not worry: ask your advisors, colleagues, and institutional scholarship offices about funding agencies where you are located. For example, in Europe, early career researchers may apply for support through the **Marie Skłodowska-Curie actions**. For example, **Shreyas Suryanarayana** (pictured at right), at the Karolinska Institutet in Stockholm, Sweden, shared the following advice with Gabby based his own experience: *I believe the Marie Curie fellowship is a generous funding opportunity for doctoral students like myself. The hallmark of this fellowship is the high quality of research training and opportunities it provides in terms of inter-disciplinary training through visits to partner labs and institutes. Highly competitive, the key on getting*



in is to have a relevant background and some credible research experience.



Once you find an applicable funding opportunity, how do you make your proposal stand apart from the competition? **Trevor Wardill** (pictured at left) of Cambridge University in Cambridge, UK, has the following advice for Gabby's readers: *When applying for money, the most important thing to do is to find out exactly what the funding agencies are interested in funding. This information comes from their funding strategy documents, their websites and talking with them. Read all this information very carefully and for each point, think laterally about how your research can fit their needs. In this way you can write a proposal that ticks as many boxes as possible so they will be very excited about receiving your proposal. The second part is doing your homework, including lots of research into your topic and really putting it into the bigger picture, so that general reviewers can immediately see why your research should be funded and how much impact it will generate. Here, my strategy has been to link the amazing specialization of invertebrates (which makes them easier to study in my opinion) to the latest vertebrate research. I also looked laterally for my model animal. I chose to look at spotted wing *Drosophila* as it uses colour vision to choose its oviposition site, but also as it is a major crop pest, meaning that the BBSRC [Biotechnology and Biological Sciences Research Council in the United Kingdom] would be interested in funding research that could be used to control it. Lastly you need to network as much as possible and make acquaintances with many researchers in your field, especially lecturers and readers. Once people know your work and you know they are excited about it, they are the perfect candidates to list as potential reviewers. When writing your proposal, it is critical that it is easy to read, interesting, up-to-date and relevant, and most of all, the reviewers when finished reading need to feel like this proposal must be funded as it is something the field has always needed doing but no one has done it yet! A very tricky mix to get right but give yourself lots of time to develop ideas and write them up but also ask for many opinions on the proposal, especially from unrelated disciplines. Be prepared to rewrite it all if they do not understand. Wishing you all best of luck, as it is tough but all the work will be worth it when you get the great news you have been funded.*

From **Jeff Riffell** of the University of Washington (pictured below), Gabby gleaned the following: *Across the board, funding has gotten more competitive, but I believe that opportunities for early career*

*neuroethologists, especially those using non-model systems, are still abundant. Often the funding might be some non-NIH or NSF sources (eg, Air Force, USDA), but in all cases, when you're working on your research proposal, it's critical to first identify the research gaps and then clearly and explicitly explain why your model system is better than *Drosophila* or a mouse at answering those gaps. Often your system will have CLEAR neuroanatomical, behavioral, and/or electrophysiological advantages over model systems, but you'll have to really sell that aspect to reviewers and program directors. But remember to speak with program directors about your project. They'll have important information for you, and can be sounding boards for your ideas (most of them are very supportive of early career scientists and want to help). You can do this by email, but having a chance to speak with them one-on-one at a conference is even better, in my opinion.*



So there you have it, gentle readers. Remember to apply early and apply often! Sometimes the chances seem slim, but I've learned that funding sometimes comes from very unexpected places.

Gabriella Wolff (Department of Neuroscience, University of Arizona) currently serves as a Graduate Student Representative on the ISN Council. Send your questions to Ask Gabby at gabbycat@email.arizona.edu.



A COLLABORATION BORN IN JAPAN

Olivier Bertrand used a Heiligenberg Student Travel Award to attend the International Congress in Sapporo, Japan. The opportunity to talk about his research with other neuroethologists led to a new research project as he describes in the following account of his travels.

On July 23, 2014, I was flying to Sapporo (Japan), thanks to the Heiligenberg Travel Award, to participate in the 10th International Congress of Neuroethology (ICN). Passionate about the problems of visual navigation based on local information, i.e. navigation with neither a global positioning system nor a compass, I am diving deeper and deeper into this field under the supervision of **Martin Egelhaaf** and **Jens-Peter Lindemann** at **Bielefeld University** (Germany). I have been always amazed by the capabilities of ants, bees, and wasps, when foraging from their nest to a food source, with a brain extremely small



compared with that of humans. At ICN I shared for the first time my theoretical work on insect navigation with the neuroethology community and, in particular, experts in insect navigation, such as **Mathew Collett**, **Barbara Webb**, **Jochen Zeil**, and **Randolf Menzel**. In particular, a talk given by **Barbara Webb** titled *Computational modelling of the central complex: which way to go?* (Symposium on Action Selection: the Role of the Insect Central Complex), has inspired my research, as I began to appreciate the many interactions taking place within the central complex.

ICN was not only a vast source of knowledge and interesting discussions, but also the starting point of a collaboration. The first results of my Ph.D. project, presented during one of the poster sessions, revealed that route following can be explained, at least partly, by a collision avoidance mechanisms combined with an overall goal direction. During a discussion with **Emily Baird** (Lund University, Sweden), we realized common research interests and the idea came up of a specific experiment we might do together. A collaboration was born between Emily, **Julien Lecoer** (a Ph.D. student at EPFL, Switzerland, under the supervision of **Dario Floreano**), and myself. Without participating in ICN and receiving the Heiligenberg Travel Award this cooperation would not have been possible.



ISN FELLOW EVE MARDER QUOTED IN THE NEW YORK TIMES

If you want to learn more about connectomics approaches to the study of nervous systems, a good place to start is an article in the January 8, 2015, issue of the *New York Times Sunday Magazine* (link given at the end of this article). Journalist Gareth Cook provides a detailed and provocative account of a research program that has the goal of mapping all of the synaptic connections in the human brain. **ISN Fellow Eve Marder** (Brandeis University) provides valuable perspective based on her own research at the end of the article.

<http://www.nytimes.com/2015/01/11/magazine/sebastian-seungs-quest-to-map-the-human-brain.html>

2015 ISN AWARD DEADLINES

The following ISN Awards are given on an annual basis. All have an application deadline of April 30, 2015. A brief description of each award follows. For further information on how to apply, please consult the ISN website. Awards are made by committees composed of active ISN members.

1. The **Heiligenberg Student Travel Awards** are awarded annually to student members of the ISN to present their research in the field of neuroethology at national and international meetings. Six or more awards (depending on the availability of funds) are available each year. The awards can be used to cover expenses such as travel, the conference registration fee, and/or housing costs up to a total of \$700. **The deadline is April 30, 2015.** Note that to qualify for a Heiligenberg Award both the student and his/her mentor must be current members of the ISN, and that two letters of recommendation from ISN members are required, one of which is typically provided by the research mentor. Applications are welcome for travel to any pertinent meeting, but **this year's funding priority is the Gordon Research Seminar and Gordon Research Conference in Neuroethology that will be held in Italy June 28 - July 3, 2015.**

2. The **Capranica Neuroethology Prize** is named in honor of Robert and Patricia Capranica and provides an annual cash prize of \$1000 in recognition of outstanding achievement or future promise in the field of neuroethology. Nominees must be the author of a paper published on line or in print during the previous calendar year that is judged to be the most outstanding in terms of scientific significance in the field of neuroethology, the novelty of the scientific discovery, the implications for scientific technical advancement, and/or importance for advancement of knowledge. The student must be first author on the submitted paper and must have played a major role in the inception and execution of the study. Either the student or the mentor must be a member of the ISN. Self-nominations are definitely encouraged! **The deadline for submission of materials for the 2015 award (see website for further information) is April 30, 2015.**

3. The **Konishi Neuroethology Research Awards** are intended to promote research by early career investigators. Funds (up to \$2500) are awarded annually and can be used to cover any direct research expenses (including travel to a field site) but conference travel, participation in formal workshops or courses, and salaries are excluded. Applications will be reviewed on the basis of scientific merit, feasibility of the project, and

consistency with the mission of the ISN. All early career investigators who are members of the ISN at the time of application are eligible to apply; for the purposes of this research award, an early career investigator is defined as a graduate student currently enrolled in a doctoral program or an investigator who has received a doctoral degree within the past 10 years. Investigators more than 10 years beyond the doctoral degree are welcome to apply, but must provide a statement on their biosketch explaining why they should still be considered early career investigators (i.e. why their career path was interrupted). **The deadline for submission of materials for the 2015 award (see website for further information) is April 30, 2015.**



MEETING ANNOUNCEMENTS

Origin and Evolution of the Nervous System
Monday 9 – Tuesday 10 March 2015, 9am-5pm
The Royal Society, 6-9 Carlton House Terrace,
London SW1Y 5AG

The origin of brains and central nervous systems is thought to have occurred before the Paleozoic era. Yet in the absence of tangible evidence there has been continued debate whether today's brains derive from one ancestral origin or whether similarities amongst them are due to convergent evolution. This meeting will consider the origin of nervous systems, integrating knowledge ranging from evolutionary theory and paleontology to comparative developmental genetics and phylogenomics. It will cover discoveries of fossil brains, as well as correspondences of neural circuit organization and behaviors, all of which allow evidence-based debates for and against the proposition that the nervous systems and brains of animals all derive from a common ancestor.

This event is intended for researchers in relevant fields and is free to attend. Participants should visit the webpage to view the program and register for the meeting: <https://royalsociety.org/events/2015/03/nervous-system>. Contact discussion.meetings@royalsociety.org for more information.

The 22nd Annual Animal Behavior Conference
Indiana University, March 26-28, 2015

The conference will open on Thursday, March 26, at 2 PM with a symposium entitled *Every Signal Thing: Mechanisms and Evolution of Animal Communication*. This symposium will feature keynote speaker **James Hare** from the University of Manitoba. The keynote

speaker for the main conference on Friday, March 27, will be **David Crews** from the University of Texas at Austin. This year the conference will also feature a special symposium on the mechanisms of social behavior to celebrate the life and career of Indiana University Professor of Biology **Jim Goodson**. This symposium will be on Saturday, March 28. Invited speakers for this exciting day of talks include **Elizabeth Adkins-Regan, Andrew Bass, Hans Hofmann, Rick Thompson, Aubrey Kelly Steven Phelps, Rosemary Knapp, Alexander Ophir, Paul Forlano, and David Kabelik**.

We welcome attendees to contribute presentation or poster abstracts, with special encouragement to undergraduate presenters. The deadline to submit an abstract is February 25, 2015. Registration for the Animal Behavior Conference is **FREE**.

For more information and to register, please visit: <http://www.indiana.edu/~animal/conference/index.php>