



# International Society for Neuroethology

## Newsletter March 2006

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**Next ISN Congress:** Vancouver, Canada, in 2007. Local organizer: Catharine Rankin, Univ. British Columbia, Dept. Psychology, 2136 West Mall, Vancouver BC V6T1Z4, Canada. Phone: +1 604-822-5906; Fax: +1 604-822-6923; [crankin@psych.ubc.ca](mailto:crankin@psych.ubc.ca)

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## The ISN President's Column

**Edward A. Kravitz** ([edward\\_kravitz@hms.harvard.edu](mailto:edward_kravitz@hms.harvard.edu))  
Harvard Medical School, Boston, Massachusetts, USA

*The Bullock Lectures:* Al Feng's committee, whose charge is to select Bullock Lecturers for support by the ISN, felt strongly that they would like to see the lectures off to a grand start by having major lectures presented in Ted's name in prominent places, high-profile national or international meetings. With Ted's blessing last year, the lectures were named for him and targeted at bringing the field of neuroethology and the ISN to the attention of neuroscientists around the world.

Ted passed away last December at 90 years of age (see obituary in this issue of the Newsletter) without having a chance to receive notice of the first of the Bullock Lec-

tures. In his memory, the ISN proposed that a symposium should be presented at the American Society for Neuroscience Meeting in the Fall of 2006, featuring leading neuroethologists. Accordingly, the names of a distinguished group of neuroethologists were submitted to the SfN for consideration, with myself and Bill Kristan as the co-chairs. Unfortunately, the SfN rejected our proposal, despite the fact that Ted was one of the founders of the SfN as well as a founder of the ISN. This was a huge disappointment to us, but was not a surprise considering that, despite its importance, neuroethology as a field has never played a large role in the SfN.

We still feel strongly that this lectureship should lead off with major lectures in prominent places and accordingly hope that several of you will consider submitting proposals to other meeting organizers. The proposals could be for Bullock Lecturers or for Bullock Symposia. If you want the ISN to support these events financially, however, the names of the suggested speakers should be submitted to Ai Feng's Committee for review well in advance of the time you are required to present the names to the meeting organizers. The procedure presently in place is for individuals to contact Ai directly [afeng1@uiuc.edu](mailto:afeng1@uiuc.edu) with your proposal. The committee will review the proposal promptly and get back to you as soon as possible with a go ahead if approved.

We also want to remind members that the ISN also offers up to six Heiligenberg Student Travel Awards per year for graduate student travel to meetings to present neuroethology-related papers or posters. To be eligible for these awards, both the student and his/her mentor must be active members of the ISN. The procedure is to submit an application for such an award well in advance of the meeting deadline, through the Society website <http://www.neuroethology.org/> Mark Konishi is Chair of the committee that will review these applications.

*The Congress in 2007:* The Committee for the next ISN Congress is being chaired by Barb Beltz, with Cathy Rankin as Co-chair and Chair of the local organizing Committee, and Ron Harris-Warrick as one of her Co-chairs. The Congress Committee selected by Barb with approval of the ISN Executive Committee is broadly representative of our growing field and the selection of Congress plenary lectures and symposia will begin very shortly. Barb and Cathy have been working hard and are extremely well organized in this effort and we look forward to yet another exciting and fun Congress in 2007 (to be held in Canada, in Vancouver, B.C., July 23-28, 2007).

*The Newsletter:* Another important issue concerns the Society Newsletter and the difficulties that Ian Meinertzhagen, our well-meaning Secretary, is having in finding people willing to write articles for publication. The Newsletter accepts historical articles, topical neuroethology-related articles, personal profiles, essays, topics of discussion and other writings that are of general interest

to members of the ISN. Please consider writing an article for the next issue of the Newsletter. We are interested in news from all countries, on all species (vertebrate and invertebrate), and at all career stages. If you email him at [I.A.Meinertzhagen@Dal.Ca](mailto:I.A.Meinertzhagen@Dal.Ca) and briefly describe what you plan to write Ian will respond promptly telling you whether the topic is suitable for the Newsletter.

*NSF and the support of neuroethology research in the US:* With new leadership at the National Science Foundation in the United States and with Kathie Olsen, herself a former neuroethologist, as the Deputy Director and Chief Operating Officer in that organization, we anticipate considerable increase in US support for the research represented by our field. In collaboration with Joe Carey at the SfN, Ian Meinertzhagen has prepared a set of questions for James Collins, the new head of the Directorate for Biological Sciences at NSF, relating to plans for support of neuroscience research. We anticipate that responses to those questions will be forthcoming soon and they will be published in the next issue of our Newsletter. Look for these important answers then.

See you all in 2007 (if not before), Ed



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## 2004 ISN Annual Financial Report

**Peter Narins**, ISN Treasurer ([scoombs@luc.edu](mailto:scoombs@luc.edu))  
Bowling Green State University, Bowling Green, Ohio, USA

Following is a statement of the Society's financial affairs as of 12/31/2005.

Total Assets as of 12/31/04: \$334,076.11  
Cash Assets: \$88,838.85  
Investment Assets: \$245,237.26

Cash Revenues in 2005: \$31,193.39  
Membership Dues: \$24,175.17  
Investment Income (Net) \$2,152.17  
Savings Interest \$361.45  
Donations: \$425.00  
Congress \$0.00  
Other \$4,079.60

Investment Portfolio: Gain/Loss (Market Value)  
Year to Date \$7,037.69  
Cumulative Since Inception (1994) \$112,661.91

Expenses in 2004: (\$33,611.56)  
Operating Expenses (\$33,611.56)  
Conference Expenses (\$0.00)

Revenues minus Expenses: (\$2,418.17)

Total Assets as of 12/31/05: \$336,543.46  
Cash Assets: \$32,968.21  
Investment Assets: \$303,575.25



# Theodore Holmes Bullock

(May 16, 1915 – Dec. 19, 2005):  
An appreciation

Bill Kristan ([wkristan@ucsd.edu](mailto:wkristan@ucsd.edu))

Section of Neurobiology, Division of Biological Sciences, UC  
San Diego, USA

Ted Bullock was an extraordinary man, both as a person and as a scientist. His approach to experimental science helped to define a field that ultimately came to be called “neuroethology”. In his nearly 70-year research career, he published papers on the nervous systems of enteropneusts (acorn worms), polychaetes, earthworms, lobsters, coelenterates, corals, sea urchins, ctenophores, sipunculids, *Limulus*, *Aplysia*, starfish, rattlesnakes, rays, sharks, various weakly-electric fish, porpoises, sea lions, cuttlefish, catfish, sloths, manatees, salamanders, frogs, turtles, hagfish, crayfish, cuttlefish, tuna, ratfish, bats, crabs, octopus, snakes, rats, and humans. And that’s just the short list! No family in the animal kingdom escaped his curiosity. He attributed this eclecticism to a “penchant for the neglected” (2), but it emerged from his unshaken belief in the comparative approach. He had two reasons for studying many organisms, backed up by long lists of examples. First, was that comparative biology provided especially favorable preparations for studying general principles. Each of the animals above was chosen with this principle in mind. Second, knowing about how a variety of animals uses the same brain structure (the cerebellum, for example, or the forebrain) would give a much better idea about what that structure really does. He pursued this approach in his own lab, in collaborations, in visits to marine stations (in Mexico, Bikini Islands, Eniwetok Atoll, Naples, Japan, the former Yugoslavia, and Great Britain); and in expeditions (to Alaska, Hawaii, Brazil, and Panama) often on research vessels, most notably the R/Alpha Helix from the Scripps Institution of Oceanography in La Jolla (he was Chair of the National Advisory Board for the Alpha Helix expeditions for several years).

Ted’s career spanned a remarkable period in the history of neurobiology. To get a sense of the enormity of the changes, consider three events in his early career. First, when he first learned the Golgi staining technique (as a junior college student), Ramon y Cajal was still publishing magnificent papers using this technique. Second, one of Ted’s first publications described the advantages of having two beams on the oscilloscope; the paper included a circuit diagram for converting your single-beam Dumont scope into a dual-beamer! Third, his classic studies in the mid-1950’s, with his postdoc and later collaborator, Susumu Hagiwara, on the squid giant synapse was motivated by testing whether synaptic transmission between neurons worked in only one direction, i.e., whether it was rectified. At that time, it was still un-

known whether the CNS was functionally a nerve net (a “reticulum”) that could conduct in both directions, depending on the site of stimulation.

Ted was born in Nanking, China, of Presbyterian missionary parents who were, to quote Ted, “Victorian in social mores, conservatives economically, but liberal religiously and politically” (1). He credited them and his “spinster aunt” with encouraging his curiosity and spirit of inquiry. He moved to southern California when he was 13 (as Chiang Kai-shek was being driven from the Chinese mainland by Mao and his Red Army) and attended Pasadena High School and Junior College. He spent four summers at the marine station run by Pomona College at Laguna Beach, where he imprinted on research on the behavior of critters in their natural state. He received his BA at UC Berkeley in 1936. He then landed a \$500 per year stipend, allowing him to stay on to get his PhD at UCB. In fact, he was so rich that he could afford to get married, to Martha Runquist, his soul mate for nearly 70 years. Ted and Martha



Ted and Martha, ice skating in 1941

raised two children, Christine and Steve, who with Martha are still going strong. Ted got his Ph.D. in 1940, doing an anatomical and physiological study of enteropneusts (acorn worms). He was excited to find that these protochordates used a peripheral nerve net to produce behaviors. In the early ‘40s, he spent time at the marine stations in Woods Hole and Pensacola, Florida determining that many cnidarians (e.g., jellyfish, anemones, corals) also use nerve nets.



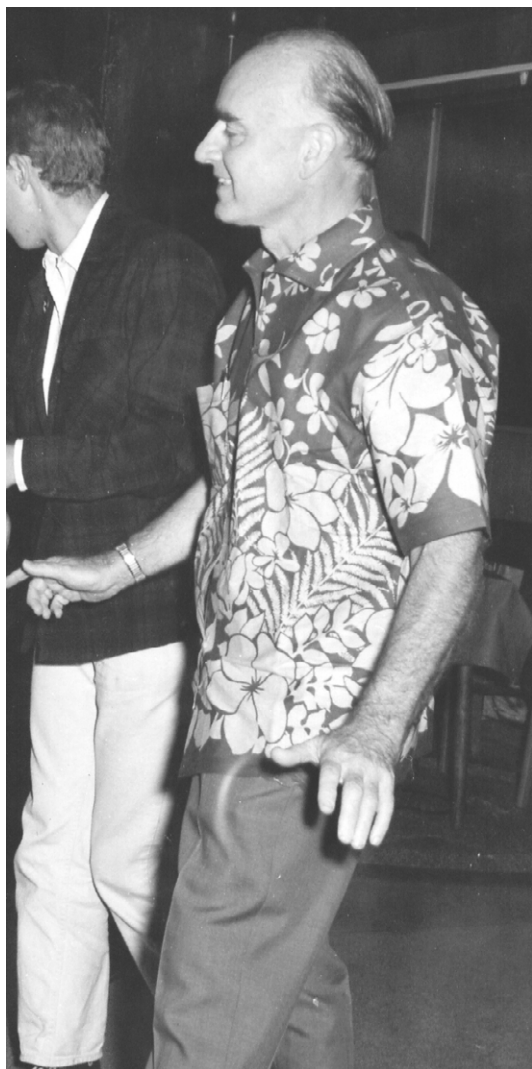
Ted tide-pooling (1940), as a graduate student at UC Berkeley. Notice the spats!

Although postdoctoral training was uncommon at the time, he wrangled a 4-year research stint at Yale, with summers at Woods Hole, where he learned many physiological techniques, particu-

larly the exciting new electrophysiological methods. He

taught in the famous Physiology Course at Woods Hole in 1944-46, and was its Director in 1955-57. Because WWII was going on during his postdoctoral time, Ted was recruited into a research project on mustard gas prophylactics and antidotes. He then was assigned to teach gross anatomy and neuroanatomy to build up the supply of medics for the war effort. Based on this experience, he landed a job teaching anatomy (gross, topographic, and applied) to medical students at the University of Missouri's 2-year Medical School. Two years later, a job in the Zoology Department at UCLA opened up. Being closer to his interests, he applied for it; UCLA had the good sense to hire him. He was at UCLA for 20 years (1946-66), and there established a major mark.

The mood in the UCLA lab was nicely captured in an obituary written by Felix Strumwasser (3), an early Bullock graduate student, for the IBRO Newsletter. Felix describes a time in the early 1950's when Ted was working with postdocs on the infrared receptors in the



Ted doing the Watusi, somewhere in Los Angeles, sometime during the 1960's.

facial pit of rattlesnakes (with Friedrich Diecke) and sympathetic control of touch receptor sensitivity in frog skin (with Werner Loewenstein), while his graduate students were studying inhibition of the nine-celled cardiac ganglion of the lobster (Donald Maynard), to be followed by Susumu Hagiwara, who was the first to impale neurons in the cardiac ganglion. In 1948, Ted received one of the first Researcher-Originated grants (the cherished "RO1" NIH grants); it was NS00021, the 21st grant given by NINDS. (He maintained this grant until 1993, when it completed its 45th year, one of the longest unbroken R01 grants ever given by that agency.) It was also during his UCLA days that, with Adrian Horridge, Ted wrote what became The Bible on invertebrate neurobiology. Officially, it was titled *Structure and Function in the Nervous Systems of Invertebrates* (1965, W.H. Freeman Press), but it was known to a generation of invertebrate neurobiologists simply as "*Bullock and Horridge*". This was an awe-inspiring feat, not only for its encyclopedic coverage of so many different phyla but also for its overviews, evaluations, and discussions of what yet needed to be done. Ted's one regret about this opus was that the publication predated the discovery of "identifiable neurons" in many different nervous systems. He was asked several times to update this magnificent work, but he claimed that there was more information being produced every five years or so than was contained in the original book, so a new edition had become an impossible task.

Ted was active in UCLA administration and politics, helping to organize the new medical school, life sciences building, and the Brain Research Institute. Ted was President of the American Association of University Professors in 1955-56, during the time when signing a loyalty oath to the state of California became a requirement for state employees; needless to say, AAUP was opposed to such silliness. He said that his major contribution to administration was to make sure that it didn't get too set in its ways! Ted was elected to the U. S. National Academy of Sciences in 1963. He had the distinction of serving as Chair of the NAS Zoology Section as it dissolved, then as Chair of the Section of Neurobiology that replaced it.

In 1966, Ted was recruited to the new UC campus in La Jolla. His appointment was in the Neurosciences Department in the medical school. (This brash new campus wanted to have a department that included first-class basic research, so they didn't want to be called "Neurology".) Ted's lab was down the hill from the main campus and medical school, at the Scripps Institution of Oceanography. In fact, Ted was Chairman of the SIO Neurobiology Unit. His lab continued its radical eclecticism: the title of his research grant was "Comparative Neurobiology", and his only restriction on what people in his lab would work was that it be an interesting project aimed at a neural understanding of behavior. Ted's insistence that research was an inclusive endeavor served the UCSD neurobiological community very well. When

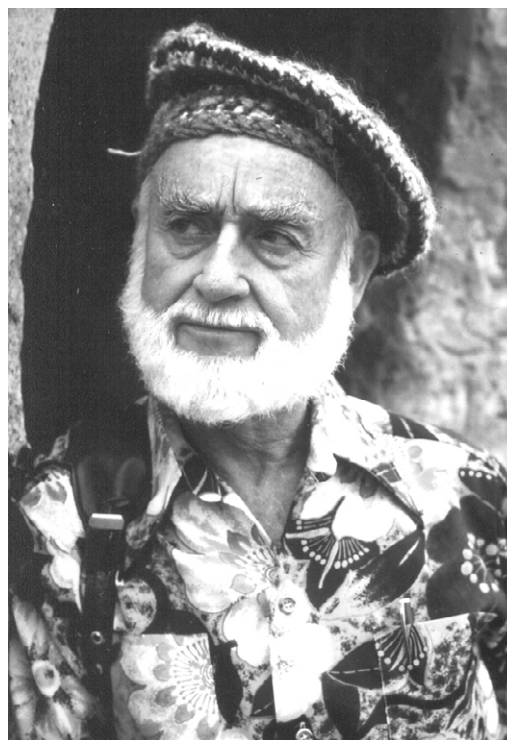


he and colleagues obtained a Sloan Training Grant in the early 1970's, for instance, Ted insisted that the bounty be shared by the whole community, not just the Neurosciences Department. This was an approach that was honed during the years that he was associated with the Neuroscience Research Program. The NRP meetings and workshops are documented in a remarkable series of volumes, but those who attended them remember the free-wheeling discussions and informality of the presentations. I was privileged to attend one of their Study Programs, in 1977, as a young pup. One of my most vivid memories is riding the shuttle over to the meeting site from the dorms each morning and seeing Ted Bullock, then in his early 60s, hiking briskly across campus, having already spent a couple of hours editing papers, followed by a brisk game of tennis.

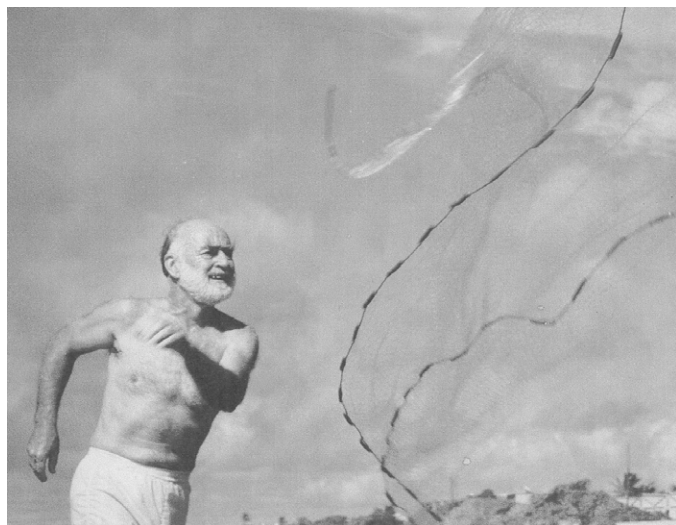
Ted's scientific career at UCSD moved from invertebrates into the vertebrate world. His life-long fascination with non-conventional, electrical interactions among neurons led him into studies on electroreception in many animals, electrical communication among some specialized fish, and evoked potentials in a variety of animals. He was fascinated by the ability of fish to detect very small electrical gradients in the water ("they could detect a 1.5 V battery with one lead in San Diego Bay and the other off the coast of Santa Barbara"), so he was sure that the field potentials in brains could be used for communication. In fact, Ted's enthusiasm and encouragement built the field of electrical communication into one of the most fruitful subsets of the neuroethological community. In the late 1960's, Ted would haul weakly electric fish all over the world with him, along with an amplifier and speaker to hear the pulses being generated by the fish, giving seminars to proselytize the wonders of this behavioral system.

During Ted's time at UCSD, he continued to be a world traveler. He traveled to every corner of the globe, to visit marine stations, to carry on collaborations, and as part of

scientific expeditions. SIO had a research vessel, the R/V Alpha Helix, that took expeditions to many parts of the Pacific Ocean. He equipped part of it with a full-scale electrophysiology rig and studied the nervous systems of a variety of marine (and non-marine) creatures. In 1966, he led a team to the Amazon basin, and in 1967 he went to the Great barrier Reef. Several times afterward, he would fly down to meet the boat in Brazil or Panama, to find out how electric fish communicated electrically, or what made a sloth slothful. He was also Director of the IBRO visiting Lecture program for several years (1979-83) and visited many institutions on IBRO business for many years. In an interview for the SfN (2), Ted said that he felt "like a citizen of the world first, of the United States second." (2).



A Scots pose: Ted visiting Budapest, in the 1980's.



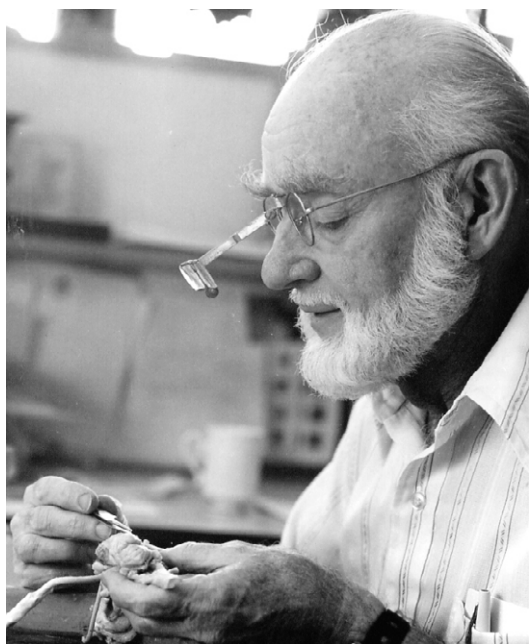
Ted throwing a net to catch sharks, in Eniwetok Atoll, 1979.

Ted was a natural leader. He developed well-reasoned opinions about science and science policy, and he was very effective in convincing people and getting them to follow him. He was President of the American Society of Zoologists (now SICB) in 1965, third president of the Society for Neuroscience in 1973-4, and the first President of the International Society for Neuroethology, 1984-87. ISN grew out of a discussion among some of the Greybeards after a meeting in Kassel, Germany in 1981. During his reign, the Society had no bylaws or formal requirements, exactly the kind of organization Ted relished. From Ted's perspective, its entire *raison d'être* was to have a lively meeting every three years that would feature the kind of research that he loved. It turned out that there were plenty of others who loved it, too, and these meetings have become the favorites of

most of the membership. One of Ted's legacies is the aggressively international flavor of the ISN. He insisted, for instance, that the first two meetings were held in Asia (Japan in 1986) and Europe (Berlin in 1989), and that the Council have broad international representation.

The National Academy of Science held a symposium for Ted in 1983, with talks by many of his former students and postdocs, when he officially retired from UCSD. Although an Emeritus Professor thereafter, Ted didn't slow down a whit. He said then that the only change he noticed in his life style was that he had to generate a greater part of his salary from his research grants. In fact, when at 88 years of age, he finally ran out of money to do wet science, he re-established a modeling study, with Terry Sejnowski, on nerve nets that had languished in his lab since Bob Josephson finished his thesis work in the 1960's. This was an appropriate move for Ted because he was one of the first experimentalists to realize the value of computational techniques both for data analysis and for modeling. His work with Jose Segundo, John Moore, George Gerstein and Don Perkel through the 1960's and 70's established a rigor that remains strong today. In fact, the 1968 review on Neural Coding edited by Perkel and Bullock is a classic in the field.

Over the years, Ted won many prizes, awards, and honorary doctorates. He won the Lashley Award from the American Philosophical Society (1968), the Gerard Prize from the SfN (1984), and a Berkeley Citation from UCB (1988). The honor that seemed to give him the greatest satisfaction was having a laboratory in Manaus, Brazil named the "Bullock-Heiligenberg Laboratory of Behavioral Physiology" in 2002.



Ted dissecting; early 1990's.

One of the most remarkable aspects about Ted in his later years is that he was much more interested in looking ahead than in looking back. He wanted to talk about new data or, better yet, the plans for how to approach an interesting question, rather than reminiscing about the past. He was asked repeatedly to write a history of some idea or another, but he tried to deflect these requests into writing about what yet needed to be done. He wrote a series of thoughtful and challenging reviews all through his career that were brain candy: fun to read and challenging at the same time.

Ted had a remarkable intellect. It was both encyclopedic (he remembered the genus and species of *plants*, as well as most of the animals he ever met) and creative. He could remember details from experiments he heard about in the 1950's and bring them to bear on a seminar he heard last week. He was fully in control of his intellectual abilities through 9 decades, and was looking forward to what he was going to do next. Ted was always gentlemanly, positive, and optimistic. He had that wonderful knack of asking questions that made people aware that they knew more than they realized they knew, so he gave them a chance to be at their best. His bushy eyebrows would rise when he saw an old friend—or a pretty woman—walk into the room. He was playful and upbeat in discussing anything. He enjoyed the personal side of science as well as the intellectual side. His career bubbled over with enthusiasms and accomplishments and friendships and wisdom. Despite the satisfaction of knowing that Ted lived a vigorous and amazingly productive life, then died peacefully, his family, friends, and colleagues miss him greatly.

Please see the notice below, of a memorial service to be held for Ted on the UC San Diego campus, May 12, 2006.

1. History of Neuroscience in Autobiography, vol. 1. Society for Neuroscience, edited by L. Squire.
2. History of Neuroscience in Autobiography, Autobiographical CDs; Society for Neuroscience; edited by L. Squire
3. Strumwasser, F. (2006) IBRO Reporter #30
4. Zupanc GKH (2006) 439:280.



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## Neuroethology and Molecular Evolution: natural bedfellows

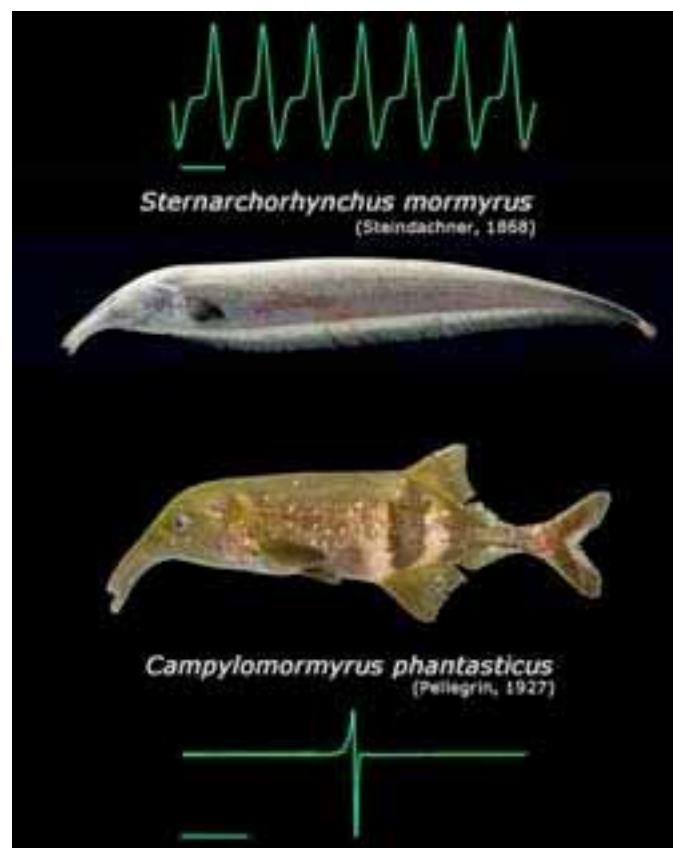
**Harold H. Zakon**

([h.zakon@mail.utexas.edu](mailto:h.zakon@mail.utexas.edu)) Section of Neurobiology, The University of Texas at Austin, USA

Today we have unprecedented opportunities to study gene evolution, with the ability to clone genes from any species and the cornucopia of available and forthcoming

genome databases. Powerful analyses are now possible with computational tools for deciphering phylogenetic histories and detecting the footprint of positive selection within gene sequences. These advances will enrich Neuroethology immensely.

An example of the marriage of molecular evolution and neuroethology is a recent collaborative study between our lab and that of David Hillis [Zakon et al., 2006 PNAS; 103: 3675-3680]. In my laboratory about 7 years ago we had cloned a  $\text{Na}^+$  channel gene from the electric organ of a weakly-electric fish. The purpose was to study how this gene was regulated by androgens and how it shaped a sexually dimorphic electric organ discharge (EOD). Upon sequencing the gene, I aligned the amino acid sequences with related sequences from the muscles (electric organ derives from muscle) of zebrafish, pufferfish, and mammals. The sequences were highly conserved but, where there was variation, it was usually in the sequence from the electric fish. At that point I went to my colleague David Hillis, showed him the sequences, and suggested that the sequence from the electric organ was evolving more rapidly than the others. He told me that there were quantitative and sophisticated methods to test for sequence evolution and, in particular, positive selection. Then he gave me a stack of papers to read and introduced me to Derrick Zwickl, his graduate student, who was to be my tutor on this topic for the next few years. We then cloned this gene in other electric and non-electric fish to have a larger dataset for our analysis.



We asked whether there is a molecular correlate to the evolution of species diversity in the electric organ discharge (EOD) of weakly electric fish. The EOD serves as a species-specific communication signal and is also used to “digitize” the fish’s environment during electrolocation. Variation in EOD duration across species ranges from 200  $\mu\text{sec}$  to 20 msec. We reasoned that the strong influences of natural and, perhaps sexual, selection on the EOD would be visible in the sequence of the  $\text{Na}^+$  channel that generates the EOD. As an added bonus, we asked if convergent evolution at the organismal level is reflected in convergent changes at the molecular level, since the two groups of weakly-electric fishes—the African Mormyriforms and South American Gymnotiforms—evolved independently.

We initially found that the muscle  $\text{Na}^+$  channel gene that is present in mammals in a single copy, duplicated early in the evolution of fishes (likely due to a genome-wide duplication at the origin of teleosts) [Lopreato et al. 2001 PNAS; 98: 7588-7592]. Both  $\text{Na}^+$  channel genes are expressed in muscle in non-electric fishes. However, in electric fish in **both** lineages, only one gene is expressed in muscle; the other gene is solely expressed in the electric organ.

Following its compartmentalization into the electric organ, the  $\text{Na}^+$  channel gene appears to have evolved rapidly and shows indications of positive selection, again in both lineages. We believe these changes were driven by the involvement of this gene in novel processes (electrolocation and communication) and new sets of selection pressures as electric fish dispersed into diverse aquatic habitats, and as a result of speciation.

We found that amino acid changes had occurred in functionally critical parts of the channel, primarily those involved in channel inactivation (closing). The inactivation of  $\text{Na}^+$  channels occurs when an intracellular loop fits inside a pocket at the inside mouth of the pore. We noted significant amino acid changes in the loop in Mormyriforms and changes in the receptor site for the loop in the mouth of the pore in Gymnotiforms. Thus, natural selection seems to have acted convergently on the inactivation process in both lineages but in complementary parts of the channel in the two lineages. We are currently examining how these amino acid changes alter the biophysical properties of the sodium current and how this, in turn, changes the waveform of the EOD.

Is this scenario unique? We note that acoustic communication systems based on the rapid contractions of swim-bladder muscles at frequencies of 100’s of Herz have independently evolved in a number of lineages of fishes, most famously in toadfish and plain-fin midshipman. We are now cloning their muscle  $\text{Na}^+$  channel genes to test whether the ancestral duplication of this gene in fishes has been a platform for the repeated evolution of novel communication systems.

One final note. We had originally dedicated this paper to Ted Bullock on his 90th birthday. Sadly, as we were about to submit the paper, Ted passed away and we had to change the birthday dedication to an *in memoriam*



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## Opportunities for Neuroethology Research in Germany

**Martin Heisenberg,**

([heisenberg@biozentrum.uni-wuerzburg.de](mailto:heisenberg@biozentrum.uni-wuerzburg.de)) Theodor-Boveri-Institut für Biowissenschaften, Würzburg, Germany

The Alexander-von-Humboldt-Foundation, Bonn, Germany, invites highly qualified post-doctoral fellows from all countries (except Germany) to apply for a research fellowship at a German University or other German research institution. Age limit: 40; applications any time. Requirements: (i) doctoral degree or comparable academic qualification; (ii) independent research activity, documented by recognised publications, preferably in international journals; (iii) a research plan agreed upon with an academic host in Germany; (iv) adequate language skills (i.e. good knowledge of English and/or German. Duration of fellowship: 6 to 12 months, with possible extension for up to 24 months. Emolument: monthly fellowship ranging from 2,100 EUR to 3,000 EUR. Additional benefits: Language Fellowship (from two to four months' intensive language course in Germany); travel expenses; family allowances. A total of 600 fellowships per year. Decision process usually takes 6 months but, in exceptional cases, can be as short as six weeks. Present application rate in Neuroethology is low compared with other fields of research.

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## Origin and Regulation of Bursting Activity in Neurons

**Gennady S. Cymbalyuk,**

([gcym@phy-astr.gsu.edu](mailto:gcym@phy-astr.gsu.edu)) Georgia State University, Atlanta, USA

A conference entitled **Origin and Regulation of Bursting Activity in Neurons** will be held in Atlanta, on April 7th and 8th.

### Keynote Speakers:

Bard Ermentrout (Pittsburgh), John Guckenheimer (Cornell), Eve Marder (Brandeis), Nino Ramirez (Chicago), John Rinzel (NYU), David Terman (Ohio State).

Registration fee, \$130 for faculty and \$50 for postdoctoral fellows. No fee for students. Registration includes breakfast and lunch on Saturday. For further information, see: <http://www.mathstat.gsu.edu/~meetings/>

The meeting is sponsored by Brains & Behavior and by the Center for Neural Communication and Computation at Georgia State University. Please, encourage your undergraduate and graduate students, and postdocs to participate in the conference.

Register by sending an e-mail to Gennady Cymbalyuk ([gcym@phy-astr.gsu.edu](mailto:gcym@phy-astr.gsu.edu)) with the following information:

1. Name
2. Affiliation
3. e-mail:
4. Phone-number:
5. Cell phone number:
6. Position: undergraduate student (); graduate student (); postdoc (); faculty ().
7. Presenting poster ()
8. () I am interested in staying in the Holiday Inn Decatur Conference Plaza in Double Room.
9. () I am interested in staying in the Holiday Inn Decatur Conference Plaza in Single Room.
10. () I am not interested in staying in the Holiday Inn Decatur Conference Plaza.
11. If you are interested in staying in this Hotel, when will you arrive and leave.
12. Do you have any food preferences?

For out-of-town registrants, we have a hotel contract with the Holiday Inn Decatur Conference Plaza (130 Clairemont Ave, Decatur, GA 30030) providing a discount room rate of \$109 per the nights of April 6, 7 and 8. Single and double rooms are available. The number of rooms allocated for our meeting is limited and will be assigned on a first come, first served basis. The hotel is located in downtown Decatur a few minutes away from a MARTA station.

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## ‘Evolution of Vision’ Symposium, 29th European Conference of Visual Perception

**Yuri Shelepin**

([ecvp@yandex.ru](mailto:ecvp@yandex.ru)) I.P.Pavlov Institute of Physiology, St. Petersburg, Russia

A symposium entitled “Evolution of Vision” will be held as part of the 29th European Conference of Visual Perception (ECVP) in St. Petersburg, Russia, 20-25 August



2006. Papers are invited on topics related to visual perception and physiology in invertebrates and to the evolution of vision. The aim of the whole-day symposium is to offer a discussion forum on comparative aspects of visual perception and physiology and their implications for evolutionary scenarios and trends.

The speaker list includes:

J. Zeil (Australian National University)  
L. Fleishman (Union College)  
M. Wicklein (University College London)  
D. Osorio (University of Sussex)  
D. Stavenga (University of Groningen)  
M. Kinoshita (Yokohama City University)  
J. Marshall (University of Queensland)  
J. Niven (University of Cambridge)  
A. Kelber (Lund University)  
D. Hunt (University College London)  
T. Cronin (University of Maryland),  
D. Nilsson (Lund University).

The conference is to take place in the most fascinating town of Russia, a show-place of European (scientific) history and culture. Updated information is available on the conference website: <http://www.ecvp2006.ru>. ECVF is a conference which is organised each year by a committee of volunteers of the scientific community. More information on ECVF conferences can be found at:

<http://www.ecvp.org>

For further information please contact: Dr Natalie Hempel de Ibarra (University of Sussex, e-mail: [nh45@sussex.ac.uk](mailto:nh45@sussex.ac.uk)) or Dr Misha Vorobyev (University of Queensland, e-mail: [m.vorobyev@uq.edu.au](mailto:m.vorobyev@uq.edu.au))

Registration and abstract submission for ECVF2006 are now open. The website of the 29th European Conference on Visual Perception (ECVP2006) is now open. Please go to <http://www.ecvp2006.ru> to sign up!

The conference will take place August 20-25th, 2006, in St-Petersburg, Russia, on the banks of the river Neva. Registration of attendants will take place in the Main Conference Hall of the Military Medical Academy from 10.00 onwards on Sunday August 20. Later that day, the opening session will be held 3 miles down the river in the Academy of Sciences' historic building, which has stood on the banks of the River Neva since the Eighteenth Century. There the Perception Lecture will be given by Professor J. D. Mollon of Cambridge University. The lecture will be followed by a visit to the Monument and Museum of M. V. Lomonosov (1711-1765), the founder of the trichromatic theory of vision and wave theory. On the same evening, a reception will be held near the palace of the first Russian member of the Royal Society of London and first Governor of St. Petersburg, Duke Aleksander Danilovich Menshikov (1673-1729), at nearby St-Petersburg University (1725). The scientific meetings, sessions and symposia from August 21 to 25 which cover the full range of visual science and will take

place in the Main Conference Hall of the Military Medical Academy. This Hall is only 100 m far from the Hotel St-Petersburg. The final symposium will be devoted to Art and Imagination in Human and Computer Vision. On Wednesday August 23, a Banquet will be organized.

Tourist attractions will include: an excursion to the Hermitage and Russian Museum, the famous Peterhoff fountains and Pavlovsk landscape park, Russian Ballet, Opera and Philharmonic classical music. A boat trip along the famous St-Petersburg rivers and canals will reveal to you the charm of this, the Northern capital of Russia! We hope to see you with us!

Please book the hotel as soon as possible. St-Petersburg hotels are filled by tourists in August. The simplest way is to go to <http://www.ecvp2006.ru>

Yuri Shelepin, MD, PhD, DS, Professor  
Executive Chair, European Conference on Visual Perception 2005  
<http://ecvp2006.ru>

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Email: [ecvp@yandex.ru](mailto:ecvp@yandex.ru)



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## Animal Behavior Society

**Jill Mateo**

[jmateo@uchicago.edu](mailto:jmateo@uchicago.edu) University of Chicago, IL, USA

The Animal Behavior Society's 43rd annual meeting will be held 12-16 August 2006 in Snowbird, Utah, USA. Famous for its mountain scenery, wildlife and natural environment, the resort at Snowbird offers a perfect locale for our meeting.

We have an exciting schedule planned, including a Key-note Address by Tim Clutton-Brock (Cambridge University), a Distinguished Animal Behaviorist Address by Robert Trivers (Rutgers University), and a Fellow's Address by Carl Gerhardt (University of Missouri). Symposia include "Behavioral Syndromes" (organized by Andy Sih and Alison Bell) and "Sensory Ecology" (Tim Wright, Jenny Boughmann and Paige Warren), and there will be a workshop on Data Collection Software (organized by Sue Margulis).

The meeting will follow a similar format to those of previous years, with a welcoming picnic on Saturday and a closing banquet on Wednesday. The Snowbird Ski and Summer Resort in the Wasatch mountains of eastern

Utah, 45 minutes from Salt Lake City, is perfectly situated to serve as the starting point for a vacation, less than one day's drive to Grand Canyon, Zion, Arches and Bryce National Parks. Scientific sessions will be held in the Cliff Lodge at Snowbird, the same building where all of the hotel rooms are located. The condos are in the Lodge and the Inn at Snowbird, a moderate 5-minute walk from the meeting rooms.

We'll see you in Snowbird! For further information see <http://www.animalbehavior.org/ABS/Meetings/Snowbird06/>, or contact the designated host Jeff Galef (mailto:galef@mcmaster.ca). Contact Jill Mateo, Acting Chair of the ABS Public Affairs Committee, for a press pass (mailto:jmateo@uchicago.edu).



## Details of Meeting

**Date:** May 12, 2006

### Locations:

Scientific presentations: on UCSD campus, 2-5PM  
Reception and dinner: Birch Aquarium, UCSD, La Jolla, CA. 6 PM

All members of ISN are welcome. Please do let us know that you are coming, so we can have enough food and drink. Also, let us know if you need help getting a place to stay.

**\*\*RSVP to Bill Kristan <wkristan@ucsd.edu> before April 15, 2006\*\***



## A Celebration of Neurodiversity: The Joys of Studying Spined, Spineless and Hemichordated Nervous Systems: A tribute to the research passions of T.H. Bullock



Theodore Holmes Bullock: Sagacity, humanity and phylogeny

**Bill Kristan** ([wkristan@ucsd.edu](mailto:wkristan@ucsd.edu))

Section of Neurobiology, Division of Biological Sciences, UC San Diego, USA

## Course Notices

### MBL Course on Neural Systems & Behavior: Marine Biological Laboratory, Woods Hole, MA, USA. June 11 - August 6, 2006

**Sarah Bottjer**

([bottjer@usc.edu](mailto:bottjer@usc.edu)) University of Southern California, Los Angeles, CA, USA

**Michael Dickinson**

([flyman@caltech.edu](mailto:flyman@caltech.edu)) California Institute of Technology, Pasadena, CA, USA

Each year, the Marine Biological Laboratory in Woods Hole offers an eight-week course entitled Neural Systems and Behavior. Through a series of intensive laboratory exercises and complementary lectures, this long-standing course has helped train many of today's leading behavioral neurobiologists. We hope that you will encourage members of your lab, as well as other outstanding students you may know, to apply for admission to this year's course, which will run from June 11 through August 6, 2005.

The course provides broad training in modern approaches to the study of behavior. Through a combination of lectures, exercises, and projects, students investigate behavior at the molecular, systems, and organismal levels using state-of-the-art techniques. The course is divided into two-week exercises, each taught by a team of leading researchers, providing participants with an in-depth familiarity with several different experimental model systems. Topics include: the cellular basis of pattern generation, the development and neuromodulatory control of cell and circuit specificity, learning and plasticity, sensory processing and feature detection, sensory-motor integration, spatial memory, and social communication. The laboratory provides access to many complementary methods including intracellular

recording, single cell dye-injection, whole-cell voltage and current clamp, neural genetics, and quantitative behavioral methods and computational analysis. Students spend a portion of each exercise designing, performing, and analyzing the results of their own project.

The course is affiliated with a Scholars-in-Residence program, in which distinguished scientists spend several days interacting with the students and faculty of the course. This program allows students to interact with top researchers, who provide an overview of the intellectual history within their respective fields. The combination of formal and informal interaction with the teaching faculty, together with the extensive laboratory experience, provides students with outstanding training and a memorable summer.

The course seeks exceptional students with backgrounds in neuroscience, biology, psychology, ethology, computational neuroscience, mathematics, engineering, and physics. Although many students take the course in their second or third year of graduate school, we also encourage postdoctoral fellows to apply. We are committed to filling the course with the highest caliber students representing a diverse array of backgrounds and interests. Applications from women and minority students are strongly encouraged.

Interested students may obtain further information and application forms by contacting Carol Hamel, Admissions Coordinator, Education Office, MBL, 7 MBL Street, Woods Hole, MA 02543-1015 (telephone 508-289-7401). Information and applications are also available online (<http://www.mbl.edu/education>) or via email ([admissions@mbl.edu](mailto:admissions@mbl.edu)). The deadline for receipt of completed applications is February 1, 2006. Substantial financial assistance is available to qualified applicants. Support for the course is provided in part by grants from the National Institute of Mental Health and the Grass Foundation.



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## **Sensory Ecology**

### **An International Course for Postgraduate Students**

**Almut Kelber**

([almut.kelber@cob.lu.se](mailto:almut.kelber@cob.lu.se)) Lund University, Sweden

The senses of animals are essential for every aspect of daily life. Whether detecting a mate or a prey, escaping the attentions of a predator or simply monitoring the surrounding habitat, an animal's senses are critical to its survival. To respond to the opportunities and dangers of the world quickly and effectively, each species must possess a sensory system that is uniquely optimised to its particular ecology. This "sensory ecology" has driven the remarkable range of sensory systems we find in Nature today.

Now in its second decade, the international postgraduate course Sensory Ecology is known throughout the world. The two-week course – which is limited to 30 participants – is organised by the Department of Cell & Organism Biology and the Department of Ecology at the University of Lund, and the Department of Crop Science at the Swedish University of Agricultural Sciences. The course is held every second year in October. The world's leading authorities in sensory ecology are invited to Lund to deliver an outstanding program of lectures covering all animal senses. The next course will take place in Lund from October 9-21, 2006. The deadline for applications is August 1<sup>st</sup> 2006.

Please see the course web site for application procedures, details of the course contents and other practical information:

[www.biol.lu.se/cellorgbiol/sensecol](http://www.biol.lu.se/cellorgbiol/sensecol)

One can also contact the organisers via the following e-mail address: [Sensory.Ecology@cob.lu.se](mailto:Sensory.Ecology@cob.lu.se)



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## **Positions Available**

**Course Assistants** for summer 2006, Neural Systems and Behavior (NS&B) course at the Marine Biological Laboratory (MBL), Woods Hole, MA.

Neural Systems and Behavior (NS&B) is an intensive, 8-week laboratory/lecture summer course for pre- and postdoctoral students. The NS&B Head Course Assistant (HCA) and Course Assistant (CA) work under the supervision of the two course Co-Directors. Duties include preparation of solutions, overseeing inventory, ordering supplies, assisting faculty, running errands, helping to organize social events, and many other diverse and important functions. Training is provided by MBL before the course begins. The HCA and CA must be in residence between about June 5 and August 7, 2006. Hours are flexible but include late nights and weekends. Applicants should have at least 2 years of undergraduate training in biology or a related field. Both positions require initiative, flexibility, organizational skills, basic familiarity with laboratory techniques, and the ability to work well with other people in an intensive environment. Compensation includes weekly minimum salary of \$300, room & board, and round-trip travel to Woods Hole.

Questions regarding the position may be directed to the Co-Directors: Sarah Bottjer, USC, ([bottjer@usc.edu](mailto:bottjer@usc.edu)), or Michael Dickinson, Caltech, ([flyman@caltech.edu](mailto:flyman@caltech.edu)).

Applicants should send resume, a written statement of qualifications & interest (2 pages maximum), and three letters of reference directly to the MBL by February 15, 2006:



Human Resources Office  
Attn: NS&B  
Marine Biological Laboratory, 7 MBL Street, Woods  
Hole, MA 02543-1015, USA  
e-mail: [resume@mbledu](mailto:resume@mbledu)  
voice: 508-289-7422  
web: <[www.mbledu](http://www.mbledu)>

MBL is an EEO Affirmative Action Institution.

### University of Oslo Postdoctoral Position

POSTDOCTORAL POSITION IN SPINAL CORD ELECTROPHYSIOLOGY. A postdoctoral position is available in the field of spinal cord electrophysiology at the Department of Physiology, Institute of Basic Medical Sciences, University of Oslo, Norway, working on a project supported by the Christopher Reeve Foundation. The project involves stimulation of descending tracts in neonatal and young adult mice combined with visual patch clamp recording and calcium imaging of spinal neurons. The laboratory is led by Professor Joel Glover and the project will be performed in collaboration with a senior researcher with substantial experience in mammalian spinal cord physiology.

Qualifications: The applicant must have a PhD or be expecting a PhD in the very near future. Research background in vertebrate CNS function is preferred. Given the nature of the project, the applicant should have broad expertise in electrophysiological techniques. Experience with the following is desirable: CNS stimulation techniques, patch clamp recording, optical/video techniques (either visual patch, calcium imaging, or other).

Research environment: The research environment includes modern electrophysiological and optical recording setups, full wet-lab for dissection and histological methods, confocal microscope, electronics workshop, in-house animal facility. The laboratory currently has 13 members including 3 postdocs. The Institute of Basic Medical Sciences at the University of Oslo is home to several strong groups in neuroscience with ample opportunities for intellectual and social interaction.

Oslo is the capital of Norway and is situated at the head of the Oslo fjord, surrounded by forested hills with unparalleled skiing and hiking possibilities within minutes of downtown. It has a cosmopolitan atmosphere and an active night-life with numerous cultural diversions. English can be used without problem.

Terms of the position: The position is for 1-2 years (second year contingent on progress during first year) and is available immediately.

Contact:

Joel Glover at [joel.glover@medisin.uio.no](mailto:joel.glover@medisin.uio.no) or Marie-Claude Perreault at [m.c.perreault@medisin.uio.no](mailto:m.c.perreault@medisin.uio.no)

### Boston University Postdoctoral Position

POSTDOCTORAL POSITION available immediately at Boston University to study neural mechanisms underlying

sexually distinct vocal pattern generation in African clawed frogs.

We use a variety of techniques including electrophysiological, histological, molecular biological and behavioral methods *in vivo* and *in vitro* to understand how neurons and neuronal circuit generate sex-specific vocal rhythms [http://www.bu.edu/biology/Faculty\\_Staff/yamaguchi.html](http://www.bu.edu/biology/Faculty_Staff/yamaguchi.html)

Candidates must have a Ph.D. and a strong background in electrophysiology, although applicants with a strong background in related disciplines of systems neuroscience are welcome to apply. This NIH funded position is renewable for up to three years.

Boston University is located in central Boston. The Biology Department has strong groups of faculty interested in neurobiology (<http://www.bu.edu/biology>) and there is a very active neuroscience community across campus (<http://www.bu.edu/neuro/index.html>). In addition to cultural diversity, Boston offers an intellectually stimulating environment for neuroscientists arising from the large number of universities in the metropolitan area.

Qualified applicants should e-mail CV, statement of research interests, and the names of three references to Dr. Ayako Yamaguchi, [ay@bu.edu](mailto:ay@bu.edu).



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## Material for Future ISN Newsletters

The Editor would welcome, indeed wholly depends upon, material for future newsletters to fill the various sections of each issue. Reference to past issues will reveal the scope and style of contributions, the breadth of their variation and the depth of their originality. Material is solicited for meetings, courses, and job opportunities which might include some aspect of neuroethology and therefore be of interest to readers of the Newsletter. Advertisements for positions (faculty or trainees) should generally aim to be not longer than 200 words, or 300 words for multiple jobs advertised in a single submission. Announcements of new books (copyright 2005) *written or edited by ISN members* should include the full citation information (including ISBN) *plus* a 40-50 word description of the book. (Note that books containing chapters contributed by an ISN member are not appropriate for inclusion.) We also welcome announcements of awards to ISN members, and of courses and future meetings, reports on recent meetings, discussions of research areas or topics of interest to neuroethologists, laboratory profiles, and editorials. We also regretfully publish occasional obituaries and memorials. Word limits depend on the type of article.

Material should be submitted no earlier than one month before the next issue (in this case, March, 2006). Have an idea for an article that you or someone else would write? Contact the Secretary prior to submission to de-



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termine the length and suitability of material to be submitted. For those who may feel their particular interest (research field, geographical region, chromosomal complement, age group, whether to dress to the left or right, etc) has been under-represented in past Newsletters, please see this as both an invitation and challenge to offset the perceived lack of representation. Remember: the Newsletter represents us all, but an empty Newsletter represents nobody, or worse still, may actually represent nothing. All material must be submitted electronically, preferably as an attached file to an e-mail prepared in MS Word and sent to Ian Meinertzhagen at iam@dal.ca

## Add our Link to Your Website!

Adding a link to ISN (<http://neuroethology.org>) on your website helps raise our profile in the scientific community.



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