

NEUROSCIENCE

SUMMER 2013

Q U A R T E R L Y

“The time is right in the 21st century for creative neuroscientists, mathematicians, and engineers to revolutionize thinking about how the nervous system works at the systems level, a middle-of-the-spectrum view providing a conceptual framework for molecular neuroscience at one end and cognitive neuroscience at the other”

– Larry W. Swanson,
SfN President

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Meet Your New Volunteer Leaders: Results of the 2013 SfN Election

The Society congratulates its newly elected officers and councilors. Chosen by members using an independent online monitoring company, the incoming council members begin their terms at Neuroscience 2013 in San Diego.

The membership elected Steven Hyman, Harvard University, as the incoming president-elect and Marina Picciotto, Yale University, as the incoming treasurer-elect. The elected incoming councilors are Emanuel M. DiCicco-Bloom, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School, and Oswald Steward, Reeve-Irvine Research Center. Appointed to fill Picciotto's seat as councilor is William J. Martin, Theravance.

OFFICERS

Steven E. Hyman is a Distinguished Service Professor of Stem Cell and Regenerative Biology at Harvard University, as well as the director of the Stanley Center for Psychiatric Research at the Broad Institute. His participation at SfN has included serving on numerous committees, including the Program Committee, the Public Information Committee, the Government and Public Affairs Committee, and the Jacob P. Waletzky Award Selection Committee. Hyman's research focuses on the discovery of fundamental mechanisms of disease underlying schizophrenia, bipolar disorder, and autism.

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The NIH BRAIN Initiative

By Story C. Landis, Director, NINDS/NIH and Thomas R. Insel, Director, NIMH/NIH

On April 2, U.S. President Barack Obama announced the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative. He described the initiative eloquently: "...there is this enormous mystery waiting to be unlocked, and the BRAIN Initiative will change that by giving scientists the tools they need to get a dynamic picture of the brain in action and better understand how we think and how we learn and how we remember. And that knowledge could be — will be — transformative." While the focus of his speech was the unveiling of the BRAIN Initiative, Obama used it to emphasize the value of investments in science, remarking on the importance of innovation and stating that scientific advances could provide unanticipated benefits and change our lives.

NIH, the Defense Advanced Research Projects Agency (DARPA), and NSF will lead the federal portion of the BRAIN Initiative. The intent is to launch the initiative in FY2014 with a commitment of federal funding of just over \$100M. In addition, several private partners, including the Allen Institute for Brain Science, the Howard Hughes Medical Institute, the Kavli Foundation, and the Salk Institute for Biological Studies, are also committed to ensuring its success.

Recognizing that there would be many questions about the NIH portion of the BRAIN Initiative, we wrote a short summary of the rationale for the initiative, which can be viewed on the Science website. The summary pointed out that mapping brain structure

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Message from the President

Exploring the Middle Ground Between Gene Networks and Cognition



Larry W. Swanson,
SfN President

Neuroscience in the last quarter of the 20th century was revolutionized by two fields at opposite ends of the spectrum: molecular neuroscience, inspired by Watson and Crick's double helix model, and cognitive neuroscience, enabled by MRI technology applied to living humans. These fields were pioneered by highly creative scientists who forged new, paradigm-shifting conceptual frameworks, as

well as by equally creative mathematicians and engineers who developed new technologies for genome-wide analyses and computer graphics approaches to visualizing complex 3D volumes such as the brain.

The time is right in the 21st century for creative neuroscientists, mathematicians, and engineers to revolutionize thinking about how the nervous system works at the systems level, a middle-of-the-spectrum view providing a conceptual framework for molecular neuroscience at one end and cognitive neuroscience at the other. What is the basic wiring diagram of the nervous system? What are the parts, how does each work, and how are they interconnected to function as a whole? What are the design features of this circuitry, and what are the architectural principles? Systems neuroscience does not benefit from an established conceptual framework like molecular biology's double helix, chemistry's periodic table of the elements, or physiology and medicine's circulatory system model. Without such a framework neuroscience cannot explain the mind and behavior in mechanistic terms because, in the end, the nervous system is an organized network of connections between spatially segregated sets of neurons.

The Obama administration's BRAIN Initiative holds great promise for all domains of neuroscience, including systems neuroscience, because, if history is any guide, innovative neurotechnologies will lead to new conceptual breakthroughs in understanding the organization and function of these connections. We know that, gram for gram, the brain is the most complex object on earth, but, for the first time that complexity does not seem insurmountable to computer scientists used to dealing with the complexity of today's internet. The availability of vast amounts of computer memory has spurred the age of big data, where previously unimaginable amounts of structural and functional neuroscience data (at very high spatial and temporal resolution) can be collected, stored, analyzed, modeled by theoretical neuroscientists, and made available publicly online.

Devising a conceptual framework will require a blend of creativity, scientific rigor, and advanced technology. These three qualities are the heart of this year's special events at Neuroscience 2013 in San Diego, making it an unparalleled place to discuss and shape the field's exciting future.

CREATIVITY

Creativity is at the heart of two events taking place on opening day of Neuroscience 2013. The popular Dialogues Between Neuroscience and Society lecture features Ed Catmull, president of Walt Disney and Pixar Animation Studios. Catmull received his PhD in computer science from the University of Utah, where in Ivan Sutherland's lab he discovered fundamental computer graphics algorithms and vowed to make the first computer-animated movie within a decade. Less than a decade later, George Lucas hired Catmull at Lucasfilm, and when Steve Jobs bought Lucasfilm in 1986 and founded Pixar, Catmull became the chief technical officer. Catmull won an Oscar in 1993 for his development of PhotoRealistic RenderMan software, and, in 1996, the first computer-animated feature film, *Toy Story*, was released by Pixar. Catmull's presentation at Neuroscience 2013, followed by a Q&A with the audience, will deal with the unique creative atmosphere he and his colleagues developed at Pixar.

The annual Fred Kavli Public Symposium will also focus on creativity. Hosted by Antonio Damasio, theoretical neuroscientist and director of the new University of Southern California Brain and Creativity Institute, the theme will be creativity and the brain. The panel will include a music scholar and composer, an artist, and an inventor.

SCIENTIFIC RIGOR AND ADVANCED TECHNOLOGY

Scientific rigor and advanced technology are always at the center of the annual meeting, and will be highlighted in Presidential Special Lecture series, organized around the theme "reinventing systems neuroscience: functional connectome architecture." The first lecturer is Scott Emmons, whose research team uses modern technology to probe the structure-function organization of the entire nervous system of the primitive roundworm, *C. elegans*. The first complete connectome was published in the 1980s using early technology; Emmons's reanalysis is revealing surprising new insights.

The second lecture is presented by Gerald Rubin, whose research group is attempting to genetically label every neuron type in the fly brain, with the ultimate goal of describing and

manipulating its much more complex connectome. The third lecture is by Jeff Lichtman, who will discuss his strategy for mapping the wiring diagram of the mouse brain at very high resolution. Finally, the last Presidential Special Lecture will be given by Doris Tsao on strategies to define the structure-function organization networks in the cerebral cortex of humans and other primates.

PAST AND FUTURE

The field of neuroscience, and SfN itself, has come a long way since the first SfN meeting in Washington, D.C., in 1971. As we look to a bright future, I encourage us to honor that history and find in it the roots of future innovation. For instance, the SfN meeting offers the History of Neuroscience lecture, this year given by Roy Wise, who will explore attempts to unravel the neural basis of reward and point to unanswered questions that require fresh approaches. I am also very excited that SfN is starting efforts to chronicle the early years of the Society, documenting how SfN has helped to support and shape the last 43 years of basic neuroscience to make today's remarkable discoveries and applications possible.

Yes, today there are very real challenges for neuroscience given current funding trajectories and consequences for the

scientific enterprise. Yet it remains an incredibly exciting time to be a neuroscientist, and I am confident we will weather these times and that the coming decades will be a era of great progress for neuroscience. Especially in these times, attending the SfN meeting is an important and rewarding way for us to connect, affirm, and advance the field's extraordinary future, while also working together to advocate for global support of neuroscience and our scientific community.

What a contrast 2013 has been from SfN's earliest days — first the European Union's 1 billion euro Human Brain Project was announced, followed by the Obama BRAIN Initiative, which has the potential to evolve into another field-changing project. What next? Exciting times cry out for creative new conceptual and technical directions. As we get closer to developing a viable conceptual framework for the nervous system, possibilities continue to open up for scientists working to answer important and pressing medical questions with profound implications for society as a whole. Neuroscience continues to rely on creativity, scientific rigor, and advanced technology for making breakthroughs, and these will be on extraordinary display at Neuroscience 2013. See you in San Diego! ■

... SfN Elections, continued from page 1

Marina Picciotto is the Charles B.G. Murphy Professor of Psychiatry, deputy chair for basic research, professor of neurobiology and pharmacology, and associate director of the MD/PhD Program at Yale University. She has served as councilor; chair and member of the Program Committee; and chair of the Annual Meeting and Social Technology advisory groups. Picciotto's area of research is the molecular basis of behaviors related to psychiatric illness, specializing in the role of nicotinic acetylcholine receptors and downstream signaling pathways in addiction, depression, and corticothalamic development.

COUNCILORS

Emanuel M. DiCicco-Bloom is a professor of neuroscience and cell biology and pediatrics at the University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School and serves on the Academic Standing Committee and Faculty Council. He has served as a member of the SfN Government and Public Affairs Committee and the Public Education and Communication Committee. His areas of research include nervous system development and how its abnormalities contribute to brain diseases.

Oswald Steward is a professor in the department of anatomy and neurobiology, neurobiology and behavior, and neurosurgery; the director at the Reeve-Irvine Research Center; and a senior associate dean for research at the University of California-Irvine School of Medicine. Steward's service for SfN includes serving as chair and member of both the Chapters Committee and the Public Information Committee, and he was appointed to fill a one-year term as Councilor in 1998. He also served as a member of the Public Advocacy Working Group. Steward's research focuses on the localization of mRNA at synapses, spinal cord injury, and axon regeneration.

William J. Martin is the executive director in the department of pharmacology at Theravance Inc., based in South San Francisco. His primary research interest is the neurobiology of pain. Prior to joining Theravance, Martin worked at Merck Research Laboratories, where he led a team of scientists focused on the discovery of novel analgesics and served as a member on the committee that oversaw the strategic direction of the neuroscience franchise. He is a current member of the Government and Public Affairs Committee and previously served on and chaired the Committee on Diversity in Neuroscience. ■

Sten Grillner: Supporting the Work of Neuroscientists Across the Globe



Sten Grillner,
Secretary General,
International Brain
Research Organization

Sten Grillner was recently elected secretary general of the International Brain Research Organization (IBRO) and has previously served as president of the Federation of European Neuroscience Societies and chairman on the Nobel Committee. He is a professor at the Karolinska Institute's Nobel Institute for Neurophysiology in Stockholm, Sweden. Grillner was the co-recipient of the 2008 Kavli Prize and is considered one of the world's foremost experts in the cellular bases of motor behavior. He is a foreign associate of the U.S. National Academy of Science.

NQ: As the new IBRO secretary-general, what are your priorities for your time in office?

IBRO can be regarded as the glue that aims to keep global neuroscience together. It is the umbrella organization of neuroscience societies and includes no less than 83 members, including SfN, regional societies such as Federation of European Neuroscience Societies (FENS) and Federation of Neuroscience Societies in Latin America (FALAN), and other societies in all parts of the world. One important aim is to promote collaboration across the globe, not least between neuroscience societies in less privileged countries with fewer resources for neuroscience. IBRO also supports different ways to catalyze interaction. This is of particular importance with regard to training at the PhD and postdoctoral levels. For example, IBRO strives to facilitate this development through interaction between SfN, FENS, and the IBRO regional committees in Latin America, Africa, and Asia.

NQ: Can you describe the work of IBRO's new Global Advocacy Committee? What are its goals and how should individual neuroscientists in diverse countries think about engaging in advocacy?

Neuroscientists need to further explain to society, as well as to different stakeholders, the importance of brain research, not only for understanding the basic principles of how our brain operates, but also for understanding the many devastating diseases of the brain. The costs for diseases of the brain amount to no less than one third of the total costs for health care in Europe and North America.

The IBRO Global Advocacy Committee (GAC) is a joint committee with representation from SfN, FENS, the chairs

of the regional committees of IBRO, the Dana Alliance, the International Society of Neurochemistry, and the national societies of Japan and Australia. GAC promises to become an important factor for the promotion of neuroscience in all 83 member organizations. The knowledge and experience of advocacy is well-developed in some countries and practically non-existent in others. The responsibility for promoting neuroscience in each country is almost entirely dependent on local neuroscientists. SfN is a key player in this respect and has developed a strategy. Substantial efforts have gone into developing different aspects of advocacy directed to both the general public and different stakeholders, including policy-makers. Advocacy must, of course, be adapted to the political and economic situations in each country. The GAC will provide a strategy for advocacy and provide resources, most likely for regional organizations working with the national societies in Latin America, Africa, Asia/Pacific, the Middle East and Northern Africa, Europe, and North America.

NQ: Public outreach is important to advance the field — it helps build public support that encourages governments to prioritize scientific research and it also creates “brain aware” citizens. What are some of the best ways that organizations like IBRO and SfN can promote neuroscience in the public sphere? What is IBRO doing in this regard?

The promotion of Brain Awareness Week (BAW) in North America, Europe, and many other parts of the world has no doubt contributed to public interest in both the healthy and diseased brain. BAW presentations to children of all ages and lectures for general audiences contribute to public awareness. Another important contribution to facilitate increased knowledge is *BrainFacts.org*, a public information initiative of SfN, The Kavli Foundation, and the Gatsby Charitable Foundation. The ability to have accurate information presented in an attractive way through a website is of unsurpassed importance. This is a source of accurate information about the brain and mind for schools, universities, and the interested community in all parts of the world. Promoting knowledge about the brain is a high priority for IBRO. This priority is also reflected in the work of the Global Advocacy Committee, discussed above.

NQ: What are some of IBRO's highest educational priorities and are there particular successes the neuroscience community should know more about?

All the regional committees, with funding from IBRO, arrange courses for PhD students in different regions. The courses range from basic to advanced techniques, and aim to recruit the most competitive PhD students and postdoctoral trainees from different areas. The committees allow the students to form their own networks. IBRO has also provided support for participation in courses at the Woods Hole science institutions and the Cold Spring Harbor Laboratory.

NQ: What are IBRO's observations about trends in neuroscience around the world? What are the unique regional challenges and opportunities of which neuroscientists should be aware?

Even if the neuroscience scene in North America is currently very competitive, proving to hold challenges for many neuroscientists, the challenges of neuroscientists in other parts of the world are often at an altogether different level. To facilitate the development of neuroscience in, for instance, the Middle East and Northern Africa, IBRO has recently formed a new subregional committee known as Middle East North Africa (MENA). There is an additional possibility and a modest budget to stimulate the interaction between researchers within this general area, and also with the global neuroscience community. ■

New Committee Addresses Rise in Ethics Complaints

By Peggy Mason

Editor's note: Peggy Mason is the chair of the new SfN Ethics Committee, established by the SfN Council in 2012 as part of SfN's enduring commitment to responsible scientific conduct and ethics. This article is the first in an occasional series focusing on questions of responsible conduct and ethical "best practices" in research.

Allegations and findings of scientific misconduct at *The Journal of Neuroscience* and other biomedical journals are on the rise. In 2008, SfN received an average of less than one complaint every other week. Last year, SfN received 34 complaints, for an average of one case every week and a half. In the first five months of 2013, SfN has received an average of more than one case each week (see chart on page 10).

Prior to March 1, ethics cases at *The Journal* were referred to the Scientific Publications Committee, and the burden of evaluating complaints fell primarily on the chair of the committee and *The Journal* editor-in-chief. In the age of open access and diminishing resources, scientific societies and their journals face a myriad of challenges and the rising number of ethics cases has demanded increasing attention and focus.

SfN Council created an Ethics Committee in order to relieve *The Journal* leadership of the ethics-related workload. Council also used the opportunity to broaden the scope of duties beyond handling allegations of scientific misconduct

and has charged the Ethics Committee with "ensuring consistency in the treatment of ethics issues across the spectrum of Society activities."

REVIEW OF ETHICS COMPLAINTS

Beginning March 1, new cases of alleged scientific misconduct have been sent to the Ethics Committee for evaluation and recommendations for action. Allegations come from authors, editors, readers, and reviewers. Although the vast majority of complaints concern alleged misconduct in an article or manuscript for *The Journal*, the Committee has also had the opportunity to advocate for authors whose published work in *The Journal* is plagiarized or misrepresented in other journals.

The Ethics Committee takes every allegation seriously. Cases are evaluated using SfN's policies and guidelines as reference, which can be found in the Member Center area of SfN.org. The Ethics Committee recognizes that being on either end of an ethics allegation is difficult personally and professionally and therefore has designed an approach that seeks to protect confidentiality and ensure due process.

When an allegation is not supported by close examination, the complaint is dismissed. Resolution of many additional

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Scientists Examine How Brain Processes Facial Expressions

From the furrowed brow of a boss to the mischievous grin of a toddler, we spend a lot of time looking at people's faces for clues about their thoughts and feelings. While scientists once debated whether the brain had a special system dedicated to faces, a growing number of studies show the brain processes faces differently than other visual information.

"We have evolved highly elaborate and highly specific mechanisms to detect mood, emotion, intention, and focus of interest information from faces," explained Martha Farah of the University of Pennsylvania during a press conference on facial recognition at Neuroscience 2012. Farah moderated the event, where presenters described recent studies uncovering the subsystems at work when individuals extract information from the faces of others.

AMYGDALA CELLS LOOK FOR INFORMATION IN EYES

Like people, nonhuman primates are very social animals, making them an ideal model for scientists studying how the brain works when processing faces. Previous studies show that monkeys look into the eyes of others for clues about emotions. Press conference presenter Katalin Gothard and colleagues at the University of Arizona wanted to understand what happens in the brain when this interactive behavior takes place.

Gothard's team took electrical readings from amygdala cells in monkeys as the animals watched another monkey on a video display. The researchers also monitored where the viewer monkey directed its gaze on the video display. When the viewer monkey focused on the eyes of the monkey on screen, a small group of cells in the amygdala fired consistently. When the monkey on screen appeared to make eye contact with the viewer monkey, these cells became more active. In contrast, this activity dipped when the viewer monkey looked at other areas on the monkey's face or elsewhere on screen.

The findings suggest some cells in the amygdala are "attuned to look for information in the eyes," Gothard said.

VENTROLATERAL PREFRONTAL CORTEX CAPTURES CHANGES IN FACIAL EXPRESSION

Scientists are uncovering new information about how the brain processes facial identity and expression from imaging studies of nonhuman primates, explained press conference presenter Shi-Pi Ku of New York University.

Ku described a recent study in which she and colleagues showed monkeys a series of images of monkeys displaying a variety of facial expressions while the viewer monkeys underwent an fMRI. The researchers found that when the viewer monkeys looked at images of the animals with different facial expressions, they displayed heightened activity in the ventrolateral prefrontal cortex (VLPFC) — a region previously shown to be sensitive to changes in voice — compared to when they viewed identical facial expressions.

Ku said the findings suggest the VLPFC might play an important role in the integration of facial expressions and vocalization information.

CHANGES IN FACIAL STRUCTURE INTERRUPT ACTIVITY PATTERNS IN ORBITOFRONTAL CORTEX

In addition to interpreting facial expressions, the brain helps people identify key differences in facial structure. For instance, previous studies show that when adults look at the faces of infants, the orbitofrontal cortex (OFC) becomes activated more quickly than when they view adult faces. This region is involved in reward and emotional processing, and its activation may help people quickly respond to the needs of infants, according to press conference presenter Christine Parsons of the University of Oxford.

Some studies suggest parents of infants with cleft lip are less responsive to their babies than other parents. Parsons tested whether slight changes in the structure of the face could alter OFC activity by asking adults to view pictures of baby faces with and without cleft lip alongside typical adult faces while undergoing magnetoencephalography (MEG).

The group found that while adults displayed heightened activity in the OFC when viewing images of typical baby faces, this activity was less strong when viewing images of infants with cleft lip. Additionally, activity in the fusiform face area (FFA) — an area of the brain specialized in face processing — was much weaker in response to the baby faces with cleft lip compared to babies without cleft lip or adults.

"This study suggests the importance of the structure of the baby face in eliciting the OFC activity and suggests that even very small changes [in facial structure] can interrupt activity patterns that may be implicated in facilitating caregiving," Parsons said. "This is not to say parents of infants with cleft lip necessarily have difficulties with their infants, because

that’s clearly not the case. However, these results may help clinicians focus on how best to support early interactions between parents and infants with cleft lip where needed.”

INTERNAL, EXTERNAL CUES OF HIERARCHY AFFECT AUTOMATIC MIRRORING OF FACIAL EXPRESSIONS

The information revealed by viewing a face is not just important to the relationship formed between a parent and child. Studies show the ability to mirror and respond to others’ facial expressions plays a key role in building relationships. Press conference presenter Evan Carr and colleagues at the University of California, San Diego, wanted to know if a person’s propensity to mimic the expressions of others changes according to how powerful a person feels or how powerful they view others to be.

To test this, the scientists asked people to watch videos of others in high-status (physician) and low-status (fast food worker) positions expressing happiness or anger. Before the video, participants completed a writing exercise primed to make them feel powerful or powerless. As the study participants watched the videos, researchers used facial electromyography (fEMG) to measure activity of two muscles that help form a smile or a frown.

The study revealed that participants reacted more strongly when a high-status individual frowned, regardless of how powerful or powerless they felt. With smiling, however, people who felt powerful were less likely to return a smile to a high-status person; people who felt powerless smiled at both high- and low-status individuals.

“The fact that both power and status seem to dictate how much you are willing to return a smile to another person suggests that subconsciously and without our awareness we are able to act as ‘human chameleons,’ in a sense to adapt to different social situations,” Carr said.

MIMICRY MAY HELP PEOPLE DETERMINE SMILE AUTHENTICITY

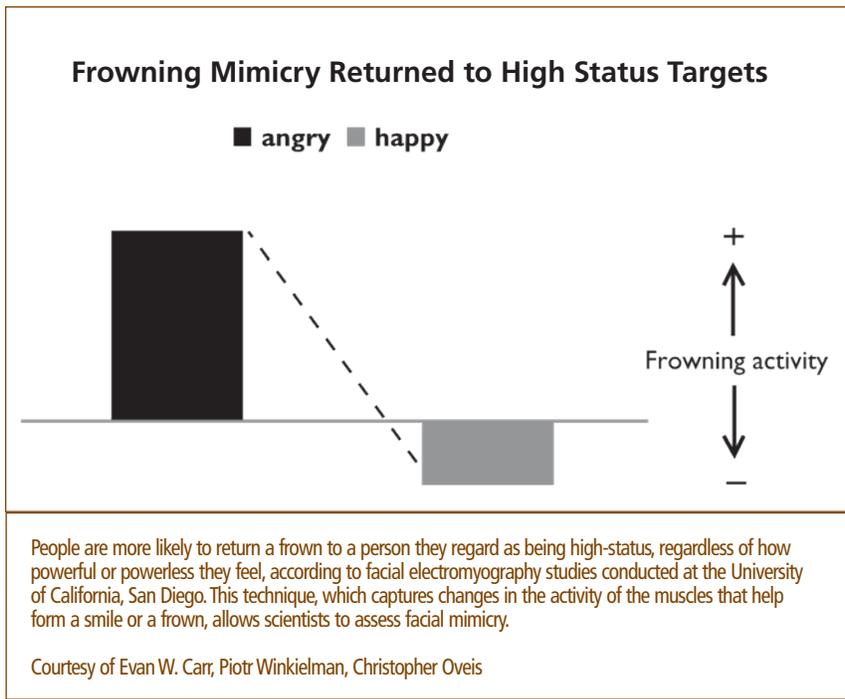
A smile can be a powerful communication tool, but how do people judge its authenticity? To investigate, Sebastian Korb and his colleagues at the University of Wisconsin,

Madison, and the University of Geneva in Switzerland showed a group of people videos of a variety of smiles. The scientists used fEMG to measure changes in participants’ facial muscle movement as they viewed the videos.

The study found that single greatest contributor to smile authenticity was the smile intensity — reflected in the activation of the muscle that raises the corners of the lips. The researchers also found that while participants mimicked nearly all smiles, the stronger the smile on screen, the stronger the participants responded with a smile. The findings suggest “facial mimicry might play a role in helping us to interpret that ambiguous smile,” Korb said.

In addition to understanding how the brain helps people decode faces in everyday situations, face processing research may help advance what is understood about disorders where social behavior is affected. For instance, people with autism and schizophrenia may experience difficulties understanding facial expressions or making eye contact with others.

“For our survival we depend on our ability to get along with and have relationships with others,” Farah noted. As such, “it makes sense that humans have such a complex and evolutionarily conserved processing system for interpreting faces.” ■



Council Round-Up: Spring 2013 Meeting

The SfN Council met April 29-30 in Washington, D.C., for its annual spring meeting. The following highlights some of the key discussion items.

SfN FY2014 OPERATING BUDGET

Council passed the FY2014 operating budget, which includes a modest number of new initiatives, including messaging and communication initiatives, U.S. and global advocacy partnerships, documenting the history of SfN, and enhancing professional development activities. At the same time, the Society continues to invest in its technical and information support infrastructure to better serve SfN's membership and add new programs.

The approved FY2014 budget projects a 1.78 percent increase in the Society's revenue and a 2.32 percent increase in expenditures over the FY2013 budget. Given the financial challenges the field is facing, Council decided to freeze membership dues for an additional year and maintain 2012 annual meeting registration fees for Neuroscience 2013. Going forward, Council and the Finance Committee will continue to monitor the Society's finances while remaining mindful of the funding environment of members.

ADVOCACY

With sequestration taking effect, the U.S. government is operating on a continuing resolution through the end of the fiscal year (September 30, 2013). Modest increases were passed as part of the resolution for both NIH and NSF, but were more than wiped out by the imposition of sequestration cuts. The Society continues to push for advocacy engagement, emphasizing that Congress still needs to act on sequestration and reverse the trajectory looking toward FY2014.

In addition, Council discussed the importance of Hill Day participation by scientists, including students and postdoctoral fellows, and continuing the conversations started during Hill Day throughout the year. Council agreed on the importance of increasing participation and engagement in advocacy-related activities including lab tours, media contributions to op-eds and blog posts, utilizing social media, and coalition engagement.

BRAIN INITIATIVE LAUNCH

On April 2, the Obama administration announced the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative, as part of the President's proposed FY2014 federal budget. SfN leaders were invited to the White House for the announcement. Initial funding totals \$100 million, divided between NIH, NSF, and Defense Advanced Research Projects Agency to "help researchers find new ways to treat, cure, and even prevent brain disorders." Council discussed the importance of the Society's role in emphasizing basic science

and ensuring that the initiative accounts for the diverse disciplines within the field of neuroscience.

PROFESSIONAL DEVELOPMENT AND GLOBAL PROGRAMS OUTREACH

Staff provided Council with an update on the progress of Latin America and European education activities, global advocacy, and professional development with an intentional and growing thread regarding online programs. Council approved the continued funding of the Teaching Tools Workshops that aim to equip educators in the African region with the knowledge, tools, and techniques needed to teach neuroscientists. In addition, it approved the FENS-SfN Higher Education Schools collaboration that provides week-long courses for the development of neuroscientists in Europe.

Additionally, the Society continues to expand its global advocacy partnership with IBRO and is embarking on a new partnership with IBRO's Women in World Neuroscience committee, sharing the goals of improving career development, mentoring, and networking opportunities for women in the field.

Following Council's approved Professional Development Strategic Plan, which includes a long-term vision for SfN becoming a leading provider of online neuroscience education, training, and career-related resources and information, Council appointed the formation of the Online Programming Advisory Group to provide scientific perspective on a comprehensive strategy for online education and training.

TRAINEE ADVISORY COMMITTEE

Council approved the forward creation of the Trainee Advisory Committee to provide the perspective of young neuroscientists. Council values the input of the Trainee Advisory Group and concluded that the trainee perspective should be available to Council and committees.

TECHNOLOGY AND WEB UPDATES

Staff reported on the successful launch of SfN.org in February, which serves as a communication hub of information for the Society and the field. The site allows members to stay up-to-date with information, resources, and news from around the world.

Council also approved the proposed mobile responsive design approach to SfN.org and *BrainFacts.org*, which aims to provide an optimal viewing experience — easy reading and navigation with a minimum of resizing, panning, and scrolling — across a wide range of devices (from desktop computer monitors to mobile phones) to improve and personalize the user experience. ■

SfN.org Illuminates Neuroscience Career Paths

One of the best ways to explore career issues and paths in the field of neuroscience is to talk with peers about their experience, especially on a topic like a career outside of academia or how to secure that next postdoctoral fellowship. But how do you find the right person to talk to and when do you find the time?

A new set of videos, career development resources, and career path profiles in SfN's new NeuroJobs Career Center gives members a way to learn from their colleagues about a wide range of topics at their own convenience. Some videos and resources explore paths beyond academia while others tap current postdoctoral members for insights into their experiences. Additional resources focus on getting papers published, mentoring, and responsible conduct.

The resources are the latest arrival in SfN's expanding set of online programs for members, an initiative led by SfN's Professional Development Committee. Over time, the program will be adding more professional development and training resources for members worldwide on SfN.org, including videos and original topical overviews, as well as live and archived webinars on vital topics to members.

CAREERS BEYOND THE BENCH: VIDEOS AND PROFILES DISCUSS LIFE OUTSIDE OF ACADEMIA

"My career has been anything but a straight line," said Katja Brose, editor-in-chief at the journal *Neuron*, who was featured in a video exploring her career in scientific publishing. Other featured career profiles range from teaching secondary science to writing about science for the public, as well as working in biotechnology, government, and as a science advocate on Capitol Hill.

The concept for these career resources grew from the "Careers Beyond the Bench" workshops offered at the SfN annual meeting. The popularity of these sessions evidenced a need for more information about the expanding opportunities in neuroscience for members around the globe.

TIPS FOR FINDING A POSTDOCTORAL POSITION, MENTORING, PUBLISHING

In a new section that helps members navigate career stages, a first video features reflections from four postdoctoral fellows. Topics include help in beginning to research a postdoctoral position, with particular attention to those

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cases is straightforward and can be quickly and easily accomplished. For example, a manuscript may include a small amount of previously published data without the necessary explicit statement disclosing the previous study. In this case, the authors are educated, the manuscript corrected, and the case closed.

Complaints that are not dismissed or easily resolved are examined in further detail by the Ethics Committee. The first step is always that the target of the allegation is afforded the opportunity to respond, potentially providing an explanation or documentation that resolves the case. Nonetheless, additional information is often needed and, in such instances, the home institution is usually asked to perform an investigation that ideally includes both analysis of original data and lab notebooks and interviews with involved scientists.

In cases involving articles or manuscripts with serious errors, the committee takes actions designed to ensure the accuracy

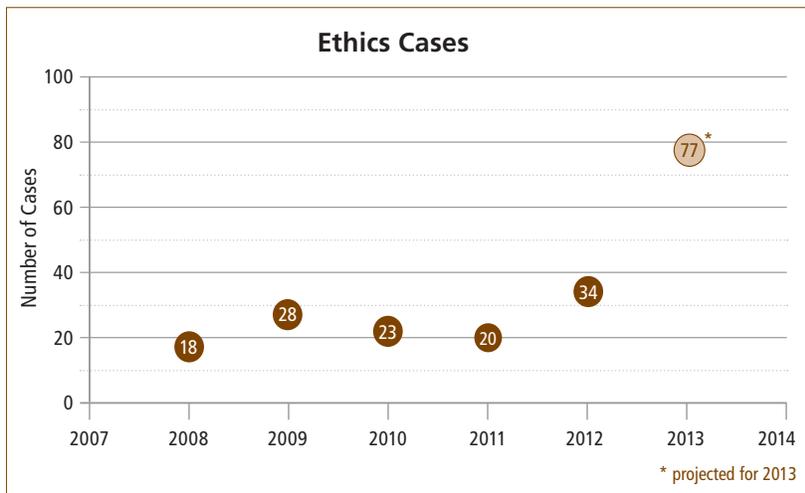
of the scientific record and reprimand those who have failed to adhere to SfN's policies on responsible conduct. Intent is immaterial. The accuracy of the scientific record must be protected. Serious errors in articles or manuscripts must be either corrected or removed through article retraction or manuscript rejection. Those responsible for these serious errors, either directly through their actions or indirectly through inadequate or negligent oversight, are sanctioned. Sanctions preclude participation in SfN activities (submitting manuscripts or abstracts, speaking at the annual meeting, serving as reviewers or editors), typically for a period of 1-3 years. Sanctions are not made public. Nonetheless, SfN intends that sanctions deter repeated offenses and promote a wider appreciation of the importance of research ethics.

AN ETHICAL WAY FORWARD

The Ethics Committee endeavors to serve the SfN membership. While the details of individual cases remain confidential, the approach taken by the committee should be

transparent and open to all. The committee therefore invites you to write to ethics@sfn.org with your comments and questions. Further information about dealing with allegations of unethical scientific conduct can be found in the Member Center area of SfN.org.

The public paints scientists with a broad brush. Misconduct by a single scientist, even in a field we perceive as distant, diminishes the public's faith in all scientists. Thus, any broach of ethics not only harms scientific progress but also damages the public perception of science and scientists in all fields. Since our work ultimately depends on the public for support, it behooves us to earn the public's respect and commitment. ■



graduate students who live outside of the United States, as well as ways to maximize a postdoctoral experience. Challenges also are candidly addressed. Future topics in the navigating career stages will include additional programs tailored for established scientists as well as younger student and postdoctoral members.

Additional resources available in the NeuroJobs Career Center include a video on research misconduct in publishing, also featuring Katja Brose of *Neuron*, a presentation from Verity Brown of the University of St. Andrews focused on getting a paper published, and other resources from the Neuroscience 2012 panel on paper publishing. ■

IWiN Working to Advance Women in Neuroscience

According to SfN's recently published Neuroscience Departments and Programs survey, women represent just more than half of the graduate students in neuroscience, but only 29 percent of all tenure-track faculty and 24 percent of full professors. To help address the disparity, the Society has led a three-year initiative to raise awareness about the issue of gender bias in neuroscience and provide practical lessons and tools for addressing it.

The efforts are part of the Department Chair Training to Increase Women in Neuroscience (IWiN) program, funded by NSF's ADVANCE program, which seeks to increase the representation and advancement of women in academic science and engineering careers, thereby contributing to the development of a more diverse science and engineering workforce.

The program began in 2010 with a series of two-day workshops at academic institutions across the United States to draw attention to the issue and educate university leaders. After five workshops for a total of nearly 150 participants, more than a dozen academic institutions have conducted workshops of their own, essentially replicating the IWiN curriculum. Today, SfN is building on those intensive efforts to communicate more broadly about these issues to the entire neuroscience community and to institutional leadership.

One important topic addressed by the workshops was the issue of "implicit bias." Though cases of overt sexism still exist, implicit bias — subtle, unconscious discrimination — is much more common and, according to recent research, women are just as likely to perpetrate it as men. Implicit bias is based in cultural stereotypes, such as the widely held (though rarely articulated) belief that men are naturally more intelligent than women, while women make better helpers. Women are often seen as nurturers, while their competence may be overlooked and undervalued.

A recent study from Northwestern University effectively illustrates this concept. The researchers asked 127 faculty members to assess a candidate for a lab manager position. They were asked to evaluate the applicant's competence and desirability as an employee and to make

recommendations about salary and mentoring. All of the faculty members received identical applications, except half of the applicants had male names and half of the applicants had female names.

Overall, the applicants with male names were seen as more competent and more desirable, and faculty members recommended they receive more money and more mentoring. Moreover, both male and female faculty members demonstrated the same bias in their reviews of candidates. In other words, in the university setting, men with the exact same qualifications as women are seen as more capable and stronger candidates, as well as deserving better pay and more guidance.

At the IWiN workshops, the discussions around implicit bias led to many revelatory moments, as participants recognized how often unconscious biases favored men at all levels, from recruitment to promotion.

At the IWiN workshops, the discussions around implicit bias led to many revelatory moments, as participants recognized how often unconscious biases favored men at all levels, from recruitment to promotion. "It was life-changing and I'll never look at a search committee the same way again," said an associate dean from Ohio State.

The IWiN initiative also goes beyond the initial set of workshops to reach broader audiences and increase impact at institutions across the United States. On June 6, SfN hosted a webinar focusing on understanding and addressing implicit bias. The recorded webinar is available on the SfN website. In addition, a series of articles and videos will be rolled out focused on issues and experiences involving implicit bias, recruitment, promotion, and creating a favorable climate for women in academia.

During Neuroscience 2013 this fall, IWiN project leaders will offer a workshop on best practices and strategies for recruiting and retaining a diverse faculty. Also at the annual meeting, but outside the IWiN grant, the inaugural symposium on Empirical Approaches to Neuroscience and Society this year will look at the data behind gender bias in science. These and other resources will be part of a growing online multimedia library aimed at increasing awareness about gender disparity and expanding the dialogue about possible solutions. Visit the Women in Neuroscience page at SfN.org for more information, including a list of resources and participating IWiN institutions. ■

BrainFacts.org Celebrates Its First Anniversary

One year ago, to celebrate the launch of *BrainFacts.org*, SfN leadership and founding partners, the Gatsby Charitable Foundation and The Kavli Foundation, gathered at public launch events in Washington, D.C., and London. Those celebrations kicked off a year of rapid development and growth for the new website. Today, the site has made tremendous strides in fulfilling its mission — sharing what neuroscientists know, exploring what they don't yet know fully, and discussing how today's research advances understanding.

“The website launched at an exciting time for neuroscience,” said Nick Spitzer, editor-in-chief of *BrainFacts.org* and professor, vice chair of neurobiology at the University of California, San Diego; and director of the UCSD Kavli Institute for Brain and Mind. “Dialogue about the brain and brain health, as well as new discoveries about the brain, are engaging people around the world. Visitors to *BrainFacts.org* can learn the latest news about neuroscience, get background about specific issues, and even engage in an online discussion, all through this website. It's an exciting endeavor to be part of.”

Through the partnership of SfN and the Gatsby and Kavli Foundations, *BrainFacts.org* has become a destination for the brain-curious public. By offering unique resources and providing fresh, up-to-date information that encourages visitors to return repeatedly, *BrainFacts.org* has enjoyed success in its first year, including:

- Attracting an average of more than a thousand visitors daily.
- Generating more than 1 million page views.
- Generating more than 50 pieces of original SfN content, with more than 50 articles contributed by content partners and 25 additional resources added to the educator section.
- An active presence in social media.
- Partnerships with the National Institute on Drug Abuse (NIDA) and TED, the nonprofit whose mission is to spread great ideas.

Additionally, the site has garnered favor with an international audience, with nearly 50 percent of readership coming from outside the United States.

RAISING PUBLIC AWARENESS AROUND BRAIN SCIENCE

Early evaluation of the site's popularity indicates that visitors access information about basic science as often as translational content. Neuroanatomy pages are among the most visited. “We are pleased that many of the site's visitors are interested in how the brain and nervous system work at a



basic level,” Spitzer said. “One of the goals of *BrainFacts.org* is to share the excitement of fundamental scientific discovery and educate about the scientific process. Preliminary analytics show the site is successfully engaging people at that level.”

Visitor feedback on social media illustrates energy and excitement about the site. Tweets praising the site's content are in abundance, and, according to Facebook analytics, *BrainFacts.org* content reaches an average of 10,000 viewers each week, mainly due to users sharing articles posted on the site.

NEW WEBSITE FEATURES

In December, *BrainFacts.org* launched a blog to enable greater engagement with the public, as well as bring additional perspectives to provide commentary on the latest research findings in the field. Visitors to the site also are able to create a free account to sign up for personalized messages called e-alerts, which provide subscribers monthly emails with the most current *BrainFacts.org* content. In recent months, nearly 250 science educators signed up to receive these updates.

PLANS FOR NEXT YEAR AND BEYOND

SfN's partnership with the Gatsby Charitable Foundation and The Kavli Foundation has allowed *BrainFacts.org* to reach success in its first year. Along with SfN's volunteer leadership, these organizations have shown dedication to the advancement of science and technology worldwide by providing guidance and sharing content. Future plans for the site include continuing to enhance the site's breadth of coverage across the field by partnering with additional content providers to raise the visibility of brain science and health.

A public information initiative of The Gatsby Charitable Foundation, The Kavli Foundation, and the Society for Neuroscience, BrainFacts.org is a resource for the general public, policymakers, educators, and students of all ages. ■

and function is already a vibrant, exciting field of science. From Brainbow and CLARITY to the Human Connectome Project, we are seeing unprecedented images of neural architecture. Breakthrough technologies, such as two-photon imaging, light-sheet microscopy, and miniaturized microendoscopes, together with calcium imaging and voltage imaging, have given us the first dynamic views of how the brain encodes information in modular circuits. Optogenetics has enabled precise manipulation of circuit activity with light pulses. These are just a few of the recent breakthroughs that can be the springboard for a new revolution in studying brain function, helping us to answer the biggest questions in neuroscience: How does the brain process information? What is the neural basis of behavior? How can we relate brain to mind?

Planning for the NIH BRAIN Initiative is well underway. NIH Director Francis Collins appointed a group of 15 external advisors, the BRAIN team, co-chaired by Cornelia Bargmann from Rockefeller University and William Newsome from Stanford University, to lead the effort. Their charge was to develop a scientific plan that will identify areas of high priority (i.e. improving current tools, identifying new directions) and deliver specific recommendations for timelines, milestones, and cost estimates.

To ensure broad scientific input to the development of the plan, the BRAIN team organized four meetings this summer. The first in San Francisco addressed molecular approaches. The second in New York City will focus on large-scale recording techniques. The third meeting in Boston will address computation, theory, and big data. The final meeting in Minneapolis will consider human measurements and analysis. Meeting agendas and summaries are to be posted on the BRAIN Initiative section of the NIH website, which also provides an opportunity for community input including contributing by submitting ideas that NIH staff will provide to the NIH BRAIN team. A draft plan will be presented to the Advisory Committee to the NIH director in December 2013 and the final plan completed in June 2014.

What will the BRAIN Initiative cost? The President has asked for roughly \$100 million across the three federal agencies to launch the first year. He noted that it's going to require a "serious effort, a sustained effort." The actual NIH budget for 2014 will be determined by Congress and may not be final for several months. Nevertheless, NIH's intention is to commit at least \$40 million for new projects within BRAIN next year and to ramp up this commitment in subsequent years. To allow us time to issue requests for applications that would be funded in 2014, we have asked the

Bargmann-Newsome team to provide some initial recommendations by the fall of 2013. These recommendations would be incorporated into the draft and final plans.

In the first year, much of the NIH funding will come from sources set aside for special projects. One of the largest contributions (\$10 million) will be from the NIH Neuroscience Blueprint, a consortium of 15 institutes and centers at NIH developed to support cross-cutting initiatives like technology development and neuroscience training. The NIH director's office, which has funds to support new, bold projects, will be the other major contributor (\$10 million). The balance will be contributed by individual institutes, including NIBIB, NIDA, NIMH, and NINDS. Each of us normally sets aside funds for initiatives. Recognizing the importance of and potential payoff from the development of new technologies, we will invest a portion of our initiative funds in BRAIN with little impact on our paylines.

Since at least 15 NIH institutes and centers fund neuroscience research, we wanted this project to involve many parts of NIH rather than be embedded in a single institute or center. The NIH Blueprint has for the past seven years successfully managed common initiatives including the Human Connectome, the Neuroinformatics Framework, the Blueprint Neurotherapeutics Project, training programs, and a host of R01s and R21s. It is the logical home for NIH BRAIN. NIH BRAIN will also need to synergize with plans developing at DARPA and NSF, as well as projects outside of government and some ambitious new efforts outside of the United States, such as the European Human Brain Project.

The President ended his announcement of the BRAIN Initiative by saying, "I don't want our children or grandchildren to look back on this day and wish we had done more to keep America at the cutting edge. I want them to look back and be proud that we took some risks, that we seized this opportunity." The combination of public health need and scientific opportunity is really why the BRAIN Initiative is "the next great American project". As with the previous "great American project", the Human Genome Project, the first step of the BRAIN Initiative is a careful, inclusive, deliberate planning process. Mapping the brain is quite different from mapping the genome – there will be no obvious endpoint and no linear sequence to decode. But the lessons learned from this earlier effort – lessons about tool development, ethical implications, and partnerships — can be helpful as we launch a new, even more daunting adventure. We predict that the BRAIN Initiative will transform neuroscience and, in addition, yield better diagnostics and therapeutics for the billions worldwide who suffer from brain disorders. ■

Neuroscience 2013 Offers Opportunities to Learn, Connect

Neuroscience 2013 in San Diego is fast approaching, with member registration opening July 17. The world's largest gathering of neuroscientists, the annual meeting features presentations from top scientists and experts in the field. This year's program offers new, innovative ways to connect with peers and share and advance great science.

FOCUS ON CREATIVITY

Discussion of creativity will be the focus of remarks by Ed Catmull, president of Walt Disney and Pixar Animation Studios and featured speaker for the Dialogues Between Neuroscience and Society session. He will address the complex reality of creativity, including the need for structure in producing art, the balance between art and technology, and the role of culture in the creation of new ideas. Catmull suggests that hidden barriers exist that impede creativity and candor, and those challenges must be overcome so that creative ideas can flourish. The Dialogues lecture is scheduled for Saturday, November 9, 11 a.m.-1 p.m.

HIGHLIGHTING THE FUNCTIONAL CONNECTOME

The Neuroscience 2013 Presidential Special Lecture Series features a variety of presentations that advance research related to the connectome, a comprehensive map of neural connections in the brain. This year's lecturers will discuss the *C. elegans* functional connectome; the functional connectome of *Drosophila*, the mouse connectome; and the systems organization of the monkey-human cerebral cortex. Scott W. Emmons of the Albert Einstein College of Medicine will speak about how the connectome of the roundworm *C. elegans* reveals the neural pathways that underlie its voluntary behavior. Gerald M. Rubin of the Howard Hughes Medical Institute will address the workings of



Neuroscience 2013 offers unparalleled opportunities for neuroscientists to engage in professional development and learning, including symposia, minisymposia, lectures, and workshops. Check SfN.org for more information and to plan your schedule. Beginning in October, the Neuroscience Meeting Planner and Neuroscience 2013 app will be available to help you plan your time.

the nervous system that allow for the manipulation of individual neuron types. Jeff Lichtman of Harvard University will probe the connective maps of the brain and their value in functions when subsets of neurons are compromised. Doris Tsao of the California Institute of Technology will delve into the method by which the brain processes a representation of objects from retinal input. The series will run Saturday through Tuesday at 5:15 p.m. during the meeting.

LEARN, NETWORK, AND ADVANCE YOUR CAREER

The annual meeting provides unparalleled opportunities for neuroscientists to engage in professional training, career development, and networking.

In addition to 52 scientific symposia and minisymposia, this year features a Neurobiology of Disease Workshop on "Human Disorders in a Dish: Induced Pluripotent Stem Cell Models

of Disease" and two short courses highlighting "Chemo and Optogenetics: Light and Chemical Control of Neuronal Circuits" and "The Science of Large Data Sets: Spikes, Fields, and Voxels." A wide range of professional and career development offerings include the popular Meet-the-Expert series, mentoring roundtables on career-related topics, and workshops on career paths, grant funding, and much more. These sessions and workshops provide opportunities for neuroscientists at various stages of their careers to network, receive guidance, and learn how to develop their skills. For more information on these and other events, log on to SfN.org/workshops.

For undergraduate student looking to explore their next training move, the second annual Graduate School Fair provides an opportunity to meet face-to-face with graduate neuroscience departments and programs. Visit SfN.org/workshops for more information

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43	trees
19,489	gallons of water
1,235	pounds of solid waste
4,322	pounds of hazardous effluent

about attending and exhibiting at the Graduate School Fair.

Many of the symposia, minisymposia, and lectures taking place at Neuroscience 2013 are accredited by the Accreditation Council for Continuing Medical Education and may serve as continuing medical education credit opportunities for physicians in the field.

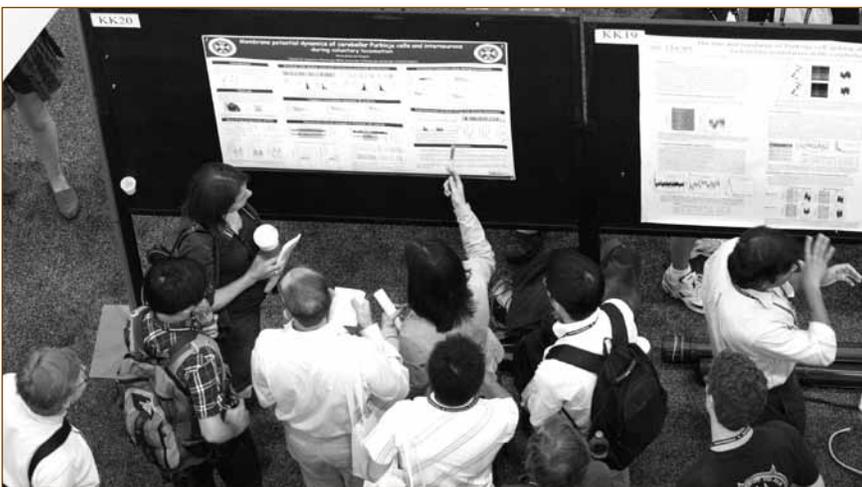
BRINGING TECHNOLOGY AND NEW MEDIA TO NEUROSCIENCE 2013

SfN invites all meeting attendees and the public to get involved with social media during the annual meeting. You can follow the official meeting Twitter account, @Neurosci2013, and use the meeting's hashtag, #SfN13, to comment on what you are seeing, hearing, and learning in real time. You will also receive social media updates from SfN, letting you know about programs and developments throughout the meeting. SfN members are also encouraged to connect with peers and other attendees through *NeurOnLine*, the Society's official online member community. Find a topic of interest being discussed at the meeting or create one of your own.

Official meeting bloggers are being selected to provide fresh perspectives to the public on each of the meeting themes. Find out how to become a meeting blogger at SfN.org, and contribute to the Neuroscience 2013 buzz.

Advanced, user-friendly applications help you plan your Neuroscience 2013 experience. The mobile meeting app and online Neuroscience Meeting Planner will allow attendees to navigate sessions, create personalized itineraries, and read full-text abstracts. Exhibitor details will also be available in the mobile app and My Neuroscience Marketplace online. These tools will become available closer to the meeting.

This year, the meeting will feature 90 dynamic poster presentations that bring neuroscience to life. These interactive displays will feature multimedia content including videos, slideshows, and animations, and provide the opportunity for face-to-face interaction with scientists. SfN encourages members to explore ways to share cutting-edge discoveries with one another and the public through dynamic posters, social media, and other outreach that supports the exciting work of SfN members and the field. ■



Neuroscience 2013 will feature more than 15,000 poster presentations spread over five days. This year, more than 30,000 neuroscientists are expected in San Diego to discuss the latest developments in the field.

SAVE THE DATE



Member Registration Opens July 17

Register early to save time and money and secure housing.

Visit SfN.org for additional dates and details.



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