

M.A. Whitehead: The Evan Ferguson Award

Dr. M.A. Whitehead, Professor

Emeritus in chemistry at McGill University in Montreal, Canada, has been named the 2013 recipient of the Sigma Xi Evan Ferguson



Award for Service to the Society.

Dr. Whitehead's dedication to Sigma Xi, both on the chapter and international levels, has been exemplary over his nearly five decades of service to the Society. He is also a favorite among the staff of Sigma Xi—well liked for his willingness to engage and strategize for Sigma Xi's bright future.

Dr. Whitehead received his Ph.D. from the University of London, Queen Mary College in 1960, following the completion of his baccalaureate degree from the same institution. From 1960 to 1961, he worked as a postdoctoral and Fulbright fellow at the University of Cincinnati before landing at McGill University in Montreal.

Dr. Whitehead has served as President of his local McGill-Montreal chapter of Sigma Xi several times over the past decade, and was recently named the Honorary Life President for his years of dedicated service. Internationally for Sigma Xi, Dr. Whitehead has served in many roles, including as a member of the Board of Directors, as Director of the Canadian and International Constituency Group, and as a member of the Committee on Nominations from 2007 to 2010. He has also been noted as the driving force behind the great success of the 2004 Sigma Xi Annual Meeting in Montreal.

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From the President



Communicating Science in the 21st Century

In the last issue of the magazine I raised questions about how we communicate science in the 21st century, as technologies offered by social media give researchers a world stage and an audience of millions, instantaneously.

In the currently constructed and ever-evolving cyberspace we must answer questions about what is authentic, what is credible, what is provable, what is reality—even what is science.

Just as provocative are questions of who can claim to be a scientist.

The Tumblr blogosphere, the Twitter sphere, Facebook, vlogs, microblogs, and other Internet realms make us reconsider who we are, how we do science, how we communicate science, how we share it, who owns it, and how we co-create it.

These are all intriguing questions that give us a stellar opportunity to reexamine the role of Sigma Xi in today's society, its future, and the place of its hallmark, award-winning magazine *American Scientist*.

Sigma Xi itself is a dynamic social network. Its programs are designed to build community in ever-extending radii of vibrant energy. New Internet technologies can redefine the portals through which we enter conversations about science.

This year we are working on a white paper that documents the state of the field in science communication technologies and offers a guide to navigating, as well as shaping, the future. How we serve the scientific research community will be imagined and how that vision aligns with our present construction of science communication interstices will be freshly articulated.

The organizers of this project include Dennis Meredith, who will engage notable science communicators across the country, as our new Chair of the Sigma Xi Publications Committee, as well as Corey Powell, the current editor of *American Scientist*. Dennis is an AAAS Fellow, elected “for exemplary leadership in university communications, and for important contributions to the theory and practice of research communication.” Corey is a science writer and a Senior Editor at *Discover* magazine, as well as an adjunct professor of science journalism at NYU.

Colleagues, here is where we will look to you to provide our crowd-sourcing quiddity. This is intended to be a participatory process so that Sigma Xi members become coauthors of the final product.

Online foundational work is expected to be completed this summer, to ready us for adding our virtual voices in the fall. Please plan on joining us soon, then, for a lively internet chat.

Your own thoughts are most welcome, fellow companions.

Linda Meadows

Michael “Michi” Tobler: Young Investigator Award

Sigma Xi is proud to announce that Assistant Professor of zoology at Oklahoma State University, **Dr. Michael “Michi” Tobler** is the 2013 Sigma Xi Young Investigator Award winner.

His research interests vary across topics to include the evolution and maintenance of sex, genital evolution and sexual conflict in live-bearing fishes, as well as geographic variation and systematics of live-bearing

fishes and cichlids in Central America. His current research predominantly focuses on the interplay of adaptation and speciation in extremophile fishes.



Dr. Tobler has won multiple awards over the course of his career thus far, including the Ralph E. Powe Junior Faculty Enhancement Award from Oak Ridge Associated Universities, the Stoye Award of the American Society of Ichthyologists and Herpetologists, and the Willi Studer Award of the Swiss Federal Institute of Technology. For more on Dr. Tobler’s work, we encourage you to visit his lab’s website at www.sulfide-life.info/mtobler.



Dr. Tobler graduated with a Ph.D. from the University of Zürich in 2008 and spent over two years as a postdoctoral researcher at Texas A&M University, before accepting a position with Oklahoma State University. He was also the Young Investigator Award winner for the Oklahoma State University Chapter of Sigma Xi in 2012, prior to winning this award on the Society’s international level.

Since 1998, the annual Young Investigator Award recognizes excellence in research with a certificate of recognition and a \$5,000 honorarium. The recipient is invited to present a lecture at the Sigma Xi Annual Meeting or other suitable occasion. Dr. Tobler will present his lecture at the 2013 Sigma Xi Student Research Conference over the weekend of November 8 and 9, 2013. •

AAAS Pacific Division Regional Meeting in Las Vegas, Nevada

Manager of Membership **Tammey Bohle** and Manager of Communications **Hallie Sessoms** were proud to represent Sigma Xi at the 94th Annual AAAS Pacific Division (AAASPD) Regional Meeting in Las Vegas, Nevada, June 16–20 at the University of Nevada, Las Vegas. The multiday meeting was quite productive for our team from Headquarters, as Tammey and Hallie worked with Northwest Regional Director of Sigma Xi, **Dr. Linda Mantel**, on revitalizing several local chapters and recruiting new members.

We are pleased to announce that thanks to the efforts made on this trip, the current number of reactivating Sigma Xi chapters is now in the mid-forties.

Between symposia, Hallie and Tammey were able to catch up with Sigma Xi members and hand-deliver Sigma Xi swag to student winners. Our team was also excited to attend a presentation by frequent *American Scientist* contributor **Dr. Robert Chianese** on “Ecological

Restoration Art and ‘Post-Natural’ Aesthetic” during the day-long session on Science and Feeling in the Arts.

Many thanks to AAASPD Executive Director and Sigma Xi Life Member **Dr. Roger Christiansen** and his wife, **Angie**, for allowing Sigma Xi’s Membership Team to attend this wonderful event yet again this year.

If you would like for representatives from Sigma Xi’s Headquarters to attend your organization’s next regional meeting or conference, please contact Tammey Bohle today at tbohle@sigmaxi.org. •



Upcoming Online Journal Benefits from Fundraising Event



In June, Executive Director **Jerry Baker** attended the reception at DIRECTV's 2013 charity golf tournament held outside of Denver, Colorado. Sigma Xi's soon-to-be launched **online journal for high school students in STEM** is one of the beneficiaries of the fundraising event.

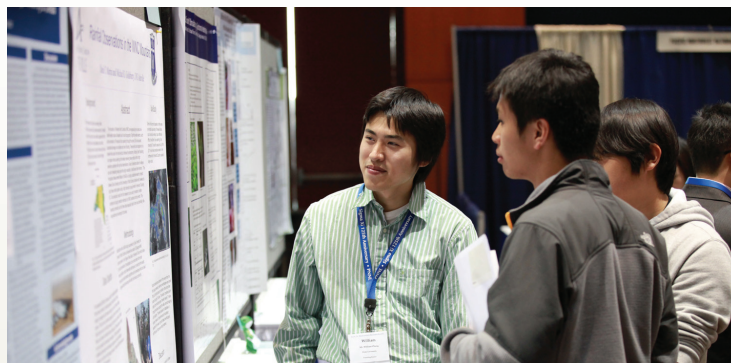
In the photo, Dr. Baker is joined by **David Baker**, member of Sigma Xi Finance Committee and also of DIRECTV, **Jacque Pace** of WNC Satcom Group, LLC, and **Melinda Keith** also of DIRECTV.



Evan Ferguson Award

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Beginning in 2008, Sigma Xi has presented the Evan Ferguson Award annually in recognition of outstanding service to the Society and its mission. The award is given in honor of Evan Ferguson's 24 years on the staff of Sigma Xi Headquarters. Known as "Mr. Sigma Xi," and widely recognized for his commitment and dedication to Sigma Xi's traditions and mission, Ferguson's combination of positive perspective and good nature was a mainstay for members, staff, and the Society as a whole. Dr. Whitehead will be recognized with a plaque and a lifetime subscription to *American Scientist* magazine in the fall of 2013. •



2013 Sigma Xi Student Research Conference will be held November 8 and 9, 2013

On November 8 and 9, 2013, undergraduate and graduate students from around the world are invited to present their research, participate in mentoring and networking activities, tour research facilities, and attend panel discussions and other events near our Headquarters in Research Triangle Park, North Carolina.

Featured speakers include 2013 Sigma Xi Award Winners **Rita Colwell**, (Former Director, National Science Foundation), **Chad Mirkin** (Director of the International Institute for Nanotechnology), and **Michael Tobler** (Assistant Professor, Oklahoma State University).

Students will present research to be evaluated by professional researchers in all fields of science and engineering. We look forward to welcoming both Sigma Xi members and nonmembers as participants at this year's conference. For more information, please visit our website at www.sigmaxi.org. •



Meet Your Fellow Companion: Mike Harding

Sigma Xi members hail from diverse fields of academia, government, and industry. Our motto is the Greek "Spoudon Xymones," or "Companions in Zealous Research." With that thought in mind, each issue in Sigma Xi Today, we like to take a moment to highlight a different "Fellow Companion"—to learn more about their work and what the honor of induction into Sigma Xi has meant for their career.

We are excited to feature **Mike Harding**, currently a graduate student at Mercer University in Macon, Georgia, in this issue's Meet Your Fellow Companions Interview Series. Harding came in first place in the engineering division at Sigma Xi's first annual virtual Student Research Showcase in the spring of 2013 for his project, *A Novel Total Ankle Replacement Device for Reduction and Compensation of Limb Length Discrepancies*. A member of the reactivating chapter at Mercer University, Harding's research covers timely medical engineering topics and brings a unique student perspective on both the coming advancements in his field and the influence of his membership in Sigma Xi on his future career.



Do you have a particular teacher or professor who inspired your love of science? Why?

Dr. Sinjae Hyun, Professor of computational fluid dynamics in the Dept. of Biomedical Engineering at Mercer University has definitely inspired my research and love of science. His relationships with students develop quickly, thanks to both his interactive teaching and his great ability to listen. Personally, I struggled to adapt to the college workload, as many students do. Dr. Hyun recognized the potential of my work and helped me attain that potential through constructive feedback. His charisma and motivational teaching styles provided a structure for my personal development into the professional and hardworking student that I am today.

Describe the patent and publishing experience—were there any bumps along the way for you?

Intellectual property (IP) has been a tough road to travel for me. I currently have three patents pending for medical devices, and each of these have been delayed or rejected for various reasons. First, the most time-consuming part of a patent application is the initial patent search. It is critical to determine if other similar ideas exist and to identify what each inventor claims in a patent. The second most critical step is defining what is special about your idea and how it is different from other ideas that are similar.

What has the honor of induction into Sigma Xi meant to you?

As part of the first class of inductees into Sigma Xi at Mercer University, I was able to work with our chapter president to learn about Sigma Xi and the benefits and opportunities that it offers students. I was very impressed with the amount of research opportunities available to Sigma Xi members. The Grants-in-Aid of Research program is simply amazing in its work to provide students and faculty at small institutions with funding for research of technological breakthroughs. The Research Showcase, the first digital conference of its kind, provided a means of sharing research over digital media while conversing with viewers and judges through forums.

How do you believe Sigma Xi will serve you in the future?

I think that my research work and my experience in the Sigma Xi Student



Research Showcase will benefit both my academic career and future employment opportunities. Recognition in a nationwide showcase serves to justify the importance of my individual research, and also puts my research in front of experts in my field to view and provide a critique of my studies.

What is your favorite motto?

My favorite motto is from Steve Jobs's 2005 Stanford University commencement speech: "No one wants to die. Everyone wants to go to heaven, but no one wants to die to get there. Don't live your life in the dogma of someone else's ideas. If today was your last, would you want to do what you are about to do? Stay hungry, stay foolish."

Sigma Xi just celebrated its 125th year. What advances do you see in your field of research over the next 125 years?

The development of the bionic human a.k.a. the real-life Iron Man (kidding)! Actually, I see the development of self-sustaining orthopedic devices with minimally invasive procedures. As life expectancies increase with breakthroughs in medicine, the need for medical devices will also increase to compensate for material wears in the human body. This research and development will skyrocket to produce some pretty amazing results that I believe will be even better than some of the more recent breakthroughs in our society. •

Please note that the text above is just a small excerpt of all Michael Harding had to say in response to our questionnaire. To read his interview in full, please visit Sigma Xi's website at <http://www.sigmaxi.org>.

Meet Your Fellow Companion: Junfeng Pan

We are pleased to feature **Junfeng Pan**, currently a research scientist and tech lead for ads data and model engineering at Facebook in Menlo Park, California, in this issue's Meet Your Fellow Companions Interview Series. After completing extensive coursework for his master's and Ph.D. in computer science in China, Pan moved to the United States to work first for Google and now Facebook in the ever-expanding world of data mining and machine learning. A dedicated Sigma Xi member, Pan's current work in artificial intelligence constantly requires interdisciplinary science knowledge and teamwork. He is an outstanding example of a fresh face of Sigma Xi's future and we are proud to feature him here in our *Meet Your Fellow Companions Series*.



What is the focus of your current research?

Currently, my main focus is on maximizing the user and advertiser experience by finding the best matches of ads and users from user responses. It is a complex smart learning model and system that can learn on large scales and in nearly real time. It simulates the human learning process at a certain level. For example, when we learn to play a song on the piano, there is an easy and a hard part. When we make a mistake, we focus on the challenging part and practice to improve. Our learning system is similar to this learning process as it moves through the stages of prediction, actual user feedback, recognition of the error, then improvement of the prediction in real time. The difference is that, our model and system work at scale. It is a distributed system spread out over a huge set of machines in multiple global regions. It learns and predicts in the magnitude of billions or trillions on a daily basis.

Tell us about something we might see in our daily lives that directly correlates to your work.

This is the most straightforward question I can answer. If you are a Facebook user, you see my work. Facebook has over 1 billion monthly active users, forming the largest scale social network on the planet.

Give us an example of how multi-disciplinary research directly contributed to your work.

This is the most exciting part of my work, as it crosses at least three domains. First, I work

on real-time learning and prediction models and systems, which are based on a solid foundation of mathematics, probability and artificial intelligence, all of which aim to simulate human learning. Second, we research user behavior in our social network while preserving privacy. Finally, we work to understand advertiser behavior. Advertisers provide bids for their ads in a variety of formats. We work to optimize multiple objectives that are most suited to auction mechanics. Auction theory is widely studied in the field of economics.

What are your thoughts on the future of STEM education?

Interest is one important key. Science, technology, engineering, and mathematics are highly correlated fields. Many students may become frustrated at the complexity of an equation at the beginning. However, it is up to us to better communicate to students that an interesting problem, and the search for its answer, can be both inspirational and rewarding. Once they find the beauty in STEM, it will drive them forward.

When you're not working on your research, what do you do in your free time?

I am into hiking. We are fortunate to have good weather here in the San Francisco Bay area with access to a lot of hiking trails.

What is your favorite motto?

"Many of life's failures are people who did not realize how close they were to success when they gave up." —Thomas Edison

What has the honor of induction into Sigma Xi meant to you?

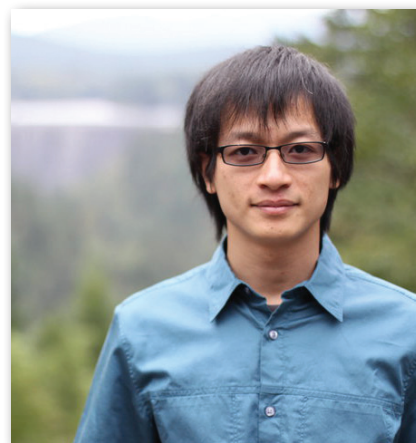
It was a great honor for me to be accepted as a member. It meant that my work was not only recognized by those in my own field but also in a broader research society. My acceptance continues to stimulate me to move forward in my research.

Has Sigma Xi helped further your career? If so, how?

Sigma Xi has helped me broaden my vision in multidisciplinary research. I am inspired to think out of the box when I meet challenging problems.

What advice would you give a young researcher just starting out in your field?

Find an interesting problem that inspires you, it will push you forward. •



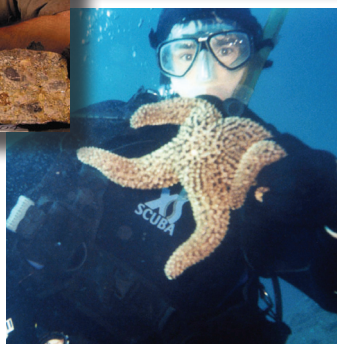
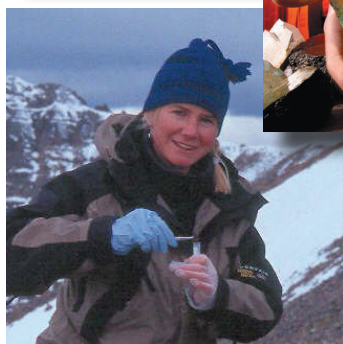
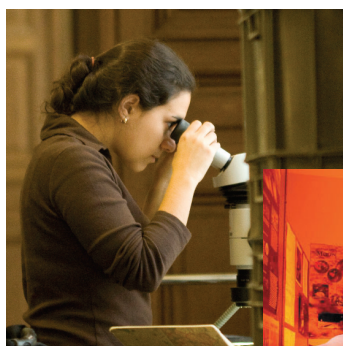
Please note that the text above is just a small excerpt of all Dr. Pan had to say in response to our questionnaire. To read his interview in full, please visit Sigma Xi's website at <http://www.sigmaxi.org>.

Grants-in-Aid of Research Deadline: October 15



**GRANTS-IN-AID
OF RESEARCH**
SIGMA XI

Sigma Xi's Grants-in-Aid of Research, valued at up to \$1,000, are available to undergraduate and graduate students in all areas of science and engineering. Designated funds from the National Academy of Sciences allow for grants of up to \$5,000 for astronomy research and \$2,500 for vision-related research. Students use the funding to pay for travel expenses to and from a research site, or for the purchase of nonstandard laboratory equipment necessary to complete a specific project. For more information, please visit Sigma Xi's website at www.sigmaxi.org.



Have YOU Received Your New Membership Kit?

Be sure to keep an eye on your mailbox—our newly styled **Membership Kit** will be making its way to you soon. This new kit will be easier for you to read and use, and includes a durable Sigma Xi Membership Card for you to carry with pride.

If you don't receive yours within 4–6 weeks of renewing your membership in Sigma Xi, please email us at memberinfo@sigmaxi.org.

SAVE • THE • DATE

The 2013 Sigma Xi Annual Meeting will be hosted virtually on November 9, 2013.

Last year's virtual Annual Meeting was a true success, as members from around the world participated with Sigma Xi's Board of Directors and fellow companions from the comfort of their homes or offices. We would like to encourage members to join chapter delegates in attending this year's meeting on **Science Communications in the 21st Century**. We look forward to "seeing" you virtually then!

