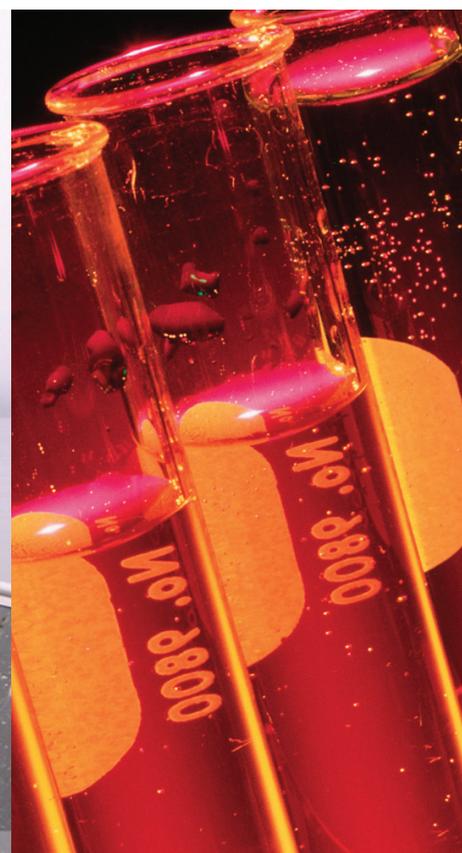


WINTER  
2011

# ACHIEVEMENTS

National Newsletter of ARCS® Foundation



Achievement Rewards for College Scientists

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# Director's Message

*Dear ARCS® Foundation Members:*

We are delighted to present our Winter 2010 edition of Achievements to you, which will bring you up to date on many activities of the National Board in this new ARCS Foundation calendar year. I would like to focus on two major projects that were launched with approval of the National Board during the National Annual Meeting on June 5th.

First, in June the National Board retained a strategy firm, Taku Group, to establish a national identity and consolidate the "brand" of the ARCS Foundation national organization and our Chapters. The CEO of Taku happens to be an ARCS Foundation Scholar Alum and she has been working with the National Communications Committee on a weekly basis to develop a dynamic and meaningful brand for ARCS Foundation. You will see the exciting results in the first quarter of 2011.

A second major effort is also nearing completion to select a vendor which will design, develop and operate a vastly upgraded website and database – providing much greater efficiencies to National and our Chapters, and serving to advance the ARCS Foundation within the general public. This process has been underway for almost two years and it's finally becoming a reality. Initial required funding for this major project was contributed through corporate sponsorships and one very generous private gift. Very exciting- stay tuned!

Aside from these two projects, the ARCS Foundation National Board constantly strives to support our current Chapters while building new Chapters. The Science and Engineering Advisory Council (SEAC), established in January, is currently assessing target areas for our next new Chapter. Discussions will continue at our National Board meeting in February 2011.

I thank you for your wonderful support of ARCS Foundation, and I will close by wishing you and your family a very happy New Year.

*Mary Lassiter Snitch,  
ARCS Foundation, National President*

## ARCS® Foundation Members Honored at University of Utah Commencement

ARCS Foundation members Judith Miller and Cecelia Foxley were honored at the University of Utah May 2010 Commencement Ceremony. The College of Engineering Distinguished Service Award was presented to them by Dean Richard Brown along with the following comments.

Each year at convocation, the College of Engineering presents The Distinguished Service Award to an individual who has demonstrated outstanding service to the advancement of engineering education. This year, we are honored to recognize two amazing individuals who have devoted months of volunteer effort to establish Utah's first chapter of Achievement Rewards for College Scientists – called "ARCS."

ARCS Foundation is a women's volunteer organization that helps both young women and men to achieve their educational aspirations. Their focus is on encouraging and rewarding the best and brightest students to pursue graduate degrees in engineering, science and medicine. Since it was established more than 50 years ago, ARCS Foundation has given away more than 13,000 scholarships valued at \$66 million to some 10,500 students across the country. The inspiration for the Utah chapter came from Judith Miller who spent nearly two years laying the groundwork at the University of Utah. A long time friend of the university, Judith is the past National Board President of ARCS Foundation and has helped establish chapters across the US. We are joining others at such prestigious universities as Cal Tech, Stanford, Berkeley, and Carnegie Mellon that are fortunate enough to have an ARCS Foundation chapter.

We are also pleased to honor Dr. Cecelia Foxley who is serving as the first Utah ARCS Foundation Chapter President. As the former Commissioner of Higher Education, Cece brings in-depth knowledge, understanding and commitment to the higher education process. She also brings her passion as the mother of a successful chemical engineering graduate from the University of Utah. We are extremely grateful to Cece for taking on the huge undertaking of establishing a new chapter.

Thanks to Judith and Cece, the ARCS Foundation Utah chapter will award its first three graduate fellowships this year. The value of these fellowships is being matched by the College of Engineering. We are extremely grateful for their vision and enthusiasm in recruiting some of Utah's leading women as ARCS Foundation chapter members.

In addition to this plaque, the college will award a scholarship in their name this fall to a student who has demonstrated distinguished service.

Judith and Cece, on behalf of future generations of students, we thank you for your lifelong commitment to supporting our nation's future engineering leaders."

*Ms. Judith Miller, Dean Richard Brown and Dr. Cecelia Foxley*



## ARCS® Foundation Alumna Receives Prestigious MacArthur Fellowship

*(Article excerpts from Oregon State University newsletter)*

Kelly Benoit-Bird, a pioneering young oceanographer from Oregon State University, has been selected as one of 23 recipients nationwide of prestigious 2010 MacArthur Fellowships. Popularly called “Genius Awards,” the fellowships include a \$500,000 stipend to further the recipient’s scholarship. They are presented annually by the John D. and Catherine T. MacArthur Foundation. Kelly earned her PhD at the University of Hawaii and received an ARCS Foundation Scholar Award in 2003 from the Honolulu Chapter.



*Dr. Kelly Benoit-Bird*

Benoit-Bird, 34, studies the interrelationships of animals in different marine environments, using acoustics and other sophisticated technologies. Her innovative uses of sonar in tracking marine creatures from Humboldt squid to spinner dolphins have led to new

discoveries about their feeding behavior, movements and even communication.

“This is a well-deserved recognition of a tremendous young scientist who not only is creative, but is an exceptionally well-rounded person,” said Mark Abbott, dean of the OSU College of Oceanic and Atmospheric Sciences. “Kelly has been instrumental in discovering new types of behaviors and structures within marine ecosystems and her observations of these actions occur in time and space scales never before seen.”

In 2005, Benoit-Bird received the Young Investigator Award from the Office of Naval Research just one year after joining the OSU faculty. The next year, she was honored by the White House with a prestigious Presidential Early Career Award for scientists and engineers. She also has received the Early Career Award from the American Geophysical Union, and was honored last year with the R. Bruce Lindsay Award for achievement by the Acoustical Society of America.

The Acoustical Society, in fact, is using Benoit-Bird as a model scientist in publications aimed at middle school students.

Benoit-Bird studies how different marine species from zooplankton to whales relate to each other in marine environments and throughout time. Her wide-ranging research includes projects on forage fish assemblages in the

Bering Sea, schooling of pelagic fish, jumbo squid in the Gulf of California, predation effects on zooplankton, foraging of dusky dolphins and sperm whale diets.

Much of her work utilizes sophisticated acoustic monitoring that allows her to track, for example, the balletic movements of foraging spinner dolphins at night when the use of cameras and lighting would be intrusive. She also creates her own digital representations of the data, and often free-hands her own scientific illustrations.

Some of Benoit-Bird’s most recent research has focused on the importance of thin layers of plankton that may range over miles of the ocean, but are only a couple of feet thick. Benoit-Bird and her colleagues concluded that these unusual assemblages are important to the feeding behavior of anchovies and sardines, helping drive the marine food web.

“We were able to create a three-dimensional map of the zooplankton and measure the response of the anchovies and sardines,” she said. “They completely changed their behavior when they encountered the thin layer.”

Just why plankton arrange themselves in the thin layer may be the subject of her follow-up research. Benoit-Bird’s studies have been funded by the National Science Foundation, Office of Naval Research and other organizations.

## Portland Chapter Tops \$1 Million in Awards and Bill Gates Sr. headlines the Celebration

“How much progress could we make if the smartest people in the world turned their attention to the poorest?” William Gates Sr. addressed this and other questions as the keynote speaker at the ARCS Foundation Portland Chapter Scholar Awards Luncheon, held October 19, 2010.

Mr. Gates was in Portland to celebrate the Chapter’s million

dollar milestone. Start-up money from the Gates Foundation enabled the Portland ARCS Foundation Chapter to turn an initial \$15,000 investment into \$1.1 million in scholar award support over six years for students in science, engineering, and medical research doctoral study at OHSU (Oregon Health & Science University) and Oregon State University. Chapter President Caron Ogg spoke on behalf of the 90 women members in honoring the achievements and future promise of our scholars. Also addressing the record setting audience of 400 was Mary Snitch, National ARCS Foundation

President and Portland ARCS Foundation Scholar Alumnus Clayton Winkler whose research in neuroscience at OHSU is a step in achieving a cure for MS.

In his talk entitled “Making a Difference: The Value of Philanthropy in Education,” Mr. Gates described grant programs at the Bill and Melinda Gates Foundation that seek to engage the brightest scientific minds in solving chronic health and infrastructure problems in the developing world. A key element of this strategy is the Foundation’s 2003 publication of ten Grand Challenges in Global Health, modeled on German mathematician David Hilbert’s 23 problems in mathematics, which were published in 1900 and have stimulated innovation in mathematics ever since.

The 41 current recipients of ARCS Foundation Portland Chapter awards met with Mr. Gates before the luncheon. “These are young people who see something that can be corrected,” said Mr. Gates in concluding his remarks. “We want them to be able to pursue that passion.”



*Bill Gates, Sr. and visiting Seattle members Susie Swindells, Carlyn Steiner, Vicki Glant, Camille Uhler, and Dottie Simpson.*



*Portland Chapter 2011 Scholar Award Recipients*



*Bill Gates, Sr. giving the keynote address*



*Portland Chapter President Caron Ogg with Bill Gates, Sr.*

# Reaching Out

*By 2010 Phoenix Scholar Award Recipient, Greg Apker*

Within the last month, the first publication from my graduate research work, “Interacting Noise Sources Shape Patterns of Arm Movement Variability in Three-Dimensional Space” was accepted to The Journal of Neurophysiology. Indeed, this was a great day for both me and my advisor/mentor, as we had been working on this project for almost three years. While this was a major accomplishment for me personally I owed a special thanks to my sponsors, Dr. Robert and Nancy Spetzler and the ARCS Foundation. Let me explain...

My research is in neural engineering at Arizona State University in the VisuoMotor Learning Laboratory. Specifically, we investigate how the brain receives information from the senses (for example, vision and touch) to plan and execute arm movements, or more simply, Sensory-Motor integration. For example, suppose you wish to take a sip from the mug on the table while reading this article. You see the mug in front of you, and your arm effortlessly moves directly toward the mug in just the right way so as to grip the handle. Simple, right? In fact, this happens to be an incredibly

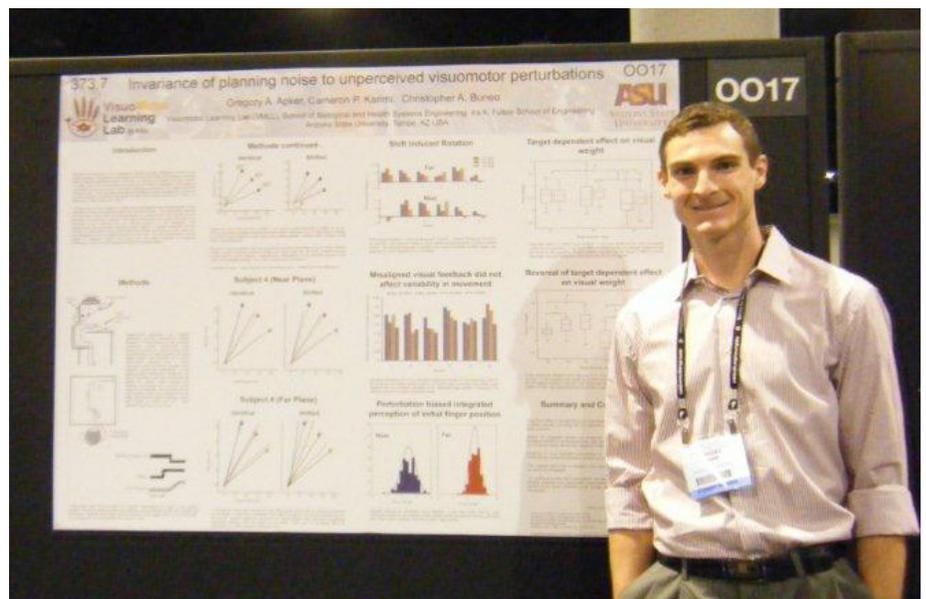
complex task, which even today’s most powerful computers struggle to reproduce, yet the brain is able to carry out nearly instantly. However, the brain is very delicate, and damage to the brain, such as from a car accident or a stroke, can result in irreversible deficit or loss of hand-eye coordination. My research focuses on investigating how the brain performs complex sensory-motor processes at its most fundamental levels. Ultimately, we hope to gain greater insight into the nature of movement disorders as a means toward developing more successful rehabilitation techniques as well as new devices to restore functionality when physical therapy alone cannot.

An important key to success for any research scientist is traveling to conferences to find other scientists with ideas and perspective which can turn someone’s “interesting data” into “meaningful results” and

just maybe “ground breaking scientific discoveries.” So two years ago, when I learned that I had been selected as an ARCS Foundation scholar, I immediately put the funding to use seizing an opportunity to travel to a small, but expensive conference, which draws many distinguished scientists in my field. While there, I attended several lectures, one of which has had a great impact on the work I have done since. In short, the lecture described how applications of statistics and probability theory can help us understand how the brain combines multiple senses seamlessly together.

I’ll briefly describe this theory in the context of my research to give you a glimpse of the work I currently do: If you close your eyes, you’ll notice that you still have a rough idea of where your hand is, enough to where you can guide your finger to your nose without seeing it. This is

*Phoenix Scholar Award Recipient, Greg Apker*



called proprioception, and on a reliability scale from 1-10 (1 being totally untrustworthy and 10 being completely reliable) let's say proprioception is about a "4". Open your eyes, and you know instantly where your hand is with a great deal of confidence. That's because vision is about a "7.5" on the reliability scale. According to this theory, when the brain receives both proprioception and vision at the same time, it combines them according to their reliability. The really clever part is that the brain can combine their individual reliabilities to become even more confident of the hand's position. So if vision is a 7.5 and the other is a 4, their combined score is about a 9, greater than either one alone! While these numbers are entirely arbitrary, I hope this example illustrates the theory of how the characteristics (e.g., statistical properties) of sensory information affect our perception of ourselves and enable us to efficiently interact with our surrounding environment.

When I learned that I was to be a two-time ARCS Foundation scholar, I packed my bags again and returned to the same conference where I had attended that all-important lecture. Once again, the ARCS Foundation had delivered me to another key moment in my graduate career: while presenting my latest findings from an experiment, I found myself talking to a man who had inspired a lot of work in the field of sensory-motor integration.

A few months later, I reached out to him for feedback regarding a paper I had been writing about the research. His critique was very helpful and a short time later the paper was submitted and recently accepted for publication.

Given all of this, when I was asked if I would write a brief article for the ARCS Foundation newsletter briefly describing my research, it seemed only fitting to do so in the context of how much the ARCS Foundation has contributed to the definition of my work. Additionally, the timing was such that it gave me a perfect opportunity to share with you as yet another example of how the ARCS Foundation makes a tangible difference in the lives and works of its scholars.

## Los Angeles Chapter Welcomes Two New Members

The Los Angeles Chapter is pleased to welcome two outstanding new members to our chapter.

**April J Ho** was supported by the ARCS Foundation as a PhD student in the Neuroscience Interdisciplinary Program at UCLA from 2007-2010. She is currently working at L.E.K. Consulting as a Life Science Specialist and helps pharmaceutical and biotechnology companies bring innovative products to the market. Before graduating, she worked in the Laboratory of Neuro Imaging under Dr. Paul Thompson researching the effects of obesity on



*Dr. April J Ho*

the brain. Before graduate school, she worked for Eli Lilly & Company in the neuroscience division. She is a recipient of the National Science Foundation Graduate Student Research Fellowship. April is also an active member in the Association for Women in Science (AWIS) and has contributed several column articles to the AWIS Magazine, attended numerous regional and local meetings, and currently serves as a Western Region Representative for National AWIS.

**Jamee Bomar** graduated summa cum laude from the University of Michigan in 2002. After graduation, she worked with Dr. Margit Burmeister to determine the genetic basis of Cayman Ataxia, a rare recessive ataxia present in the Cayman Islands. This work resulted in a first author Nature Genetics publication. She then worked with Dr. Mark Opp to elucidate the role of human urocortin II in circadian

## Next Issue

*Congratulations to the Northern California Chapter who is celebrating their 40th Anniversary this year! Details and photos of their celebration will be featured in the Spring ACHIEVEMENTS Newsletter.*



*Jamee Bomar*

rhythms. At the University of California, Los Angeles, as a staff research associate, Jamee focused on identifying the transcriptional targets of FOX2, the only known protein directly involved in language disorders, in the developing human brain under the mentorship of Dr. Daniel Geschwind. This work was accepted by the scientific journal Nature. Jamee is a Ph.D.

candidate who is currently in her fourth year in the IDP neuroscience program at UCLA. She works in Dr. Geschwind's lab on determining the developmental role of JAKMIP1, an autism candidate gene. Jamee is the student representative for the neuroscience IDP executive committee and the UCLA neurology grand rounds selection subcommittee. She also is a member of the NSIDP neuroscience graduate forum. Jamee is a UCLA brain research institute volunteer judge for the California state science fair and also volunteers for UCLA's project brainstorm, a community teaching outreach program. Jamee was recently nominated for the K. Patricia Cross Future Leader Award. Jamee is a member of the Association for Women in Sciences. In her free time, Jamee is a marathon runner and is currently training for the Boston Marathon.

## An ARCS® Foundation National News Publication

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