Orange County Chapter

February 2016

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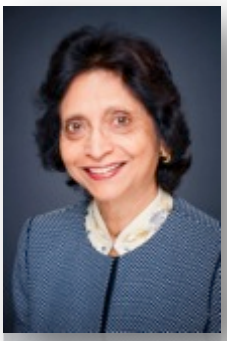
pH Reading from the President

The Orange County chapter of ARCS Foundation was founded by Ms. G. Patricia Beckman, who became interested when her father was invited to several ARCS events. The OC Chapter was founded by Mary Cesario, Mary Lou Furnas, and founding president Patricia Beckman. Each ARCS president has provided great leadership to advance the goals of ARCS and science in our community. As the Orange County ARCS Chapter begins its 16th year as an organization, I am honored to serve as President. What a privilege and responsibility to follow in the footsteps of Patricia Beckman and others.

A president can only be successful with the support of previous leadership and the Board of Directors. A goal this year is to strengthen relationships with our scholar alums, scholars, members, donors and our community.



Chandra Jain
Orange County Chapter President 2015-2016

This Newsletter is just one vehicle to reach out to our community. We are featuring early innovations by Dr. Arnold O. Beckman. The pH meter was just the beginning of many contributions made by Dr. Beckman to the scientific community. I am sure many of our Scholars, including Mr. Sumner Norman, featured in this newsletter, have used Dr. Beckman's innovations during their academic life.

I welcome your feedback to make this Newsletter interesting to read.

We are on the WEB
www.arcsfoundation.org/orange_county

Save the Date

ARCS® Foundation 16th Annual Scholar Awards Dinner
Wednesday, March 23, 2016

ARCS Foundation is an all women all volunteer organization dedicated to supporting the advancement of science in the United States by providing monetary awards to outstanding scholars in the STEMM fields (that double "M" was not a typo…the second "M" is for Medicine). The women who founded ARCS in 1958 saw the need to promote the education of U.S. Citizens in advanced fields of scientific research and applied science. One of 17 chapters, Orange County Chapter provides awards to exceptional PhD students at UC Irvine. This year the chapter is funding 15 ARCS Scholars.

At the Awards Dinner our ARCS Scholars will remind us of their contributions in their fields in science, engineering and medicine now and in the future. This event is a wonderful chance to meet the ARCS Scholars, and learn about their research during the poster session/reception. Keynote speakers will be second year ARCS Scholars who will speak about their research. We hope that you will all be there to share in the festivities.

Chapter Events

February 3: Lunch with Scientist, Greg Weiss, Professor of Chemistry, UCI - " Unboiling an Egg and Beyond"
March 23: 16th Scholar Awards Dinner, Beckman Center
March 30: Field Trip to UCI School of Physical Sciences
June 15: General Membership meeting, Annual Pot Luck, State of the Organization, installation of 2016-17 Officers

Scholar Feature

Sumner Norman
School of Engineering

Sumner Lee Norman is a doctoral candidate in the biorobotics laboratory at UC Irvine. Sumner earned the B.S. degree in Mechanical Engineering from the University of Utah in 2012. He graduated with high honors and the undergraduate research scholar designation after conducting haptics & rehabilitation research at the University of Utah and theoretical physics research at Brigham Young University. Sumner earned the M.S. degree in Mechanical and Aerospace Engineering from UC Irvine in 2014, and is currently working towards a PhD. His research is investigating new methods of recovery after neurological trauma such as stroke and spinal cord injury.

ARCS Scholars 2015-2016

First Year Scholars

Biological Sciences
Allison Najafi, Neurobiology & Behavior

Engineering
Dominique Ingato, Chemical Engineering

Information & Computer Sciences
Christine Wolf, Informatics

Medicine
Lisa (Soyeon) Baik, Physiology & Biophysics

Physical Sciences
Timothy Carleton, Physics & Astronomy

Second Year Scholars

Biological Sciences
Nan Wu Hultgren, Molecular Biology & Biochemistry
Zachariah Reagh, Neurobiology & Behavior

Engineering
Sarkis Babikian, Electrical & Computer Engineering
Sumner Norman, Mechanical & Aerospace Engineering
Caitlin Regan, Biomedical Engineering

Information & Computer Sciences
Kyle Benson, Computer Science

Medicine
Elyse Van Spyk, Biological Chemistry

Physical Sciences
Kristine Dahl Arquero, Atmospheric Chemistry
Clayton Elder, Earth System Science
Thomas Baker, Physics

Sumner was recently invited to present his work at the Congressional Caucuses on Robotics and Innovation on Capitol Hill in Washington, D.C. He met directly with 12 congressional offices and the Office of Science and Technology Policy at the White House to discuss his research and the impact of science funding at the national level. He has also been invited to present at the Institute of Electrical and Electronics Engineers (IEEE) Neural Engineering, American Society for Neurorehabilitation, and Data Science Initiative Conferences. As a graduate student at UC Irvine, Sumner has mentored several undergraduate and high school students, and has taught an undergraduate robotics course. In addition to the ARCS award, Sumner received the National Science Foundation (NSF) Graduate Research Fellowship, Dean's Prize at the Associated Graduate Student Symposium, and Data Science Initiative Summer Fellowship.

Sumner's research investigates the use of brain computer interface (BCI) technology in robot-assisted therapy after stroke, the leading cause of disability worldwide. Each year, approximately 795,000 people suffer a stroke in the U.S., costing the United States healthcare system an estimated 34 billion dollars. In recent years, innovations in robot-assisted movement therapy have provided patients with the ability to train in a more controlled and engaging environment, leading to modest increases in recovery. However, the optimal human-machine interaction strategies of rehabilitation robots remain unknown. BCI systems are able to decode signals that are recorded using non-invasive electrodes on the surface of the patient's scalp, known as electroencephalography, or "EEG". Sumner's research proposes BCI systems for the purpose of enhancing robot-assisted rehabilitation training. Thus far, his research has characterized new facets of brain activity during robot-assisted therapy and found biomarkers of brain function that can predict response to robot therapy. These findings have shown for the first time that BCI can play an important role throughout the rehabilitation process, including outcome prediction, online training, and detection of patient engagement in therapy. Through the findings of his research, Sumner aims to improve the quality of life for stroke survivors in both clinical outcome and activities of daily living through BCI-robot rehabilitation.

Through the generous support of Sue and Nick Alexopoulos and ARCS Foundation, Sumner was able to attend several conferences that would have not otherwise been possible. Most prominently, this includes the IEEE Neural Engineering conference in Montpellier, France. Sumner was also able to purchase a state of the art PC dedicated to processing the large datasets inherent to BCI research. In addition to the personal and financial support, the wonderfully active nature of the ARCS leadership and members has provided Sumner with invaluable experiences to meet and network with world leaders in both academic and industrial sciences.

ARCS Members Visit the Science Heritage Center

Arnold Beckman and the Acidometer -1934

The Board and a small group of ARCS members visited the Science Heritage Center (SHC) at Keck Graduate Institute (KGI) in Claremont California. The tour was hosted by Jim Osborne, the Robert E. Finnigan Professor at KGI, Director of the Center for Biomarker Research, and Curator of the exhibit. SHC was founded in 2010 by Jim and consists of more than 50 instruments spanning multiple generations, allowing visitors to trace the technical developments that made each model better than the one that preceded it. Visitors can see how various inventions developed for government and industry lead to breakthroughs in medicine by giving physicians the tools they need to diagnose and manage a variety of diseases and medical conditions.

For example, the Oxygen Analyzer on display dates back to 1943. Invented by Beckman and Nobel Prize winner Linus Pauling, it was initially developed to measure the oxygen content of air in airplanes and submarines. Later, it was used to help hospital staff accurately monitor oxygen levels in incubators to reduce the risk of blindness among premature infants.

Pauling Oxygen Meter - 1943

Another important instrument on exhibit is the first commercial automated blood cell counter, the model A Coulter Counter. In 1948, Coulter invented a way to count and measure cells using impedance measurements, the Coulter Principle. He introduced the first automated blood cell counter based on it in 1956. Today, a majority of blood cell counters are based on the Coulter Principle, and this Principal has also found wide use in industrial applications requiring particle analysis.

The Coulter Counter

The tour was followed by lunch at La Parolaccia, a wonderful Italian restaurant in the village of Claremont.

The Science Heritage Center is open to the public and KGI encourages individuals interested in the history of scientific instruments, high school groups and undergraduate college students to tour the exhibit in hopes of sparking their interest in translating advances in life science into innovative commercial products.

Science Heritage Center
KECK GRADUATE INSTITUTE
of Applied Life Sciences

Donate to ARCS Foundation Orange County. Why Give?

A gift to ARCS Foundation is an opportunity to contribute to America's scientific and economic future by supporting the best of our nation's science and engineering graduate students. For corporations, foundations and individuals, ARCS Foundation provides a unique and cost-effective method to provide direct support for the most promising scholars at UC Irvine

Mission Statement

The ARCS Foundation provides scholarships to academically outstanding United States citizens studying science, medicine and engineering thereby contributing to the worldwide advancement of science and technology.

100% of donations to Scholar Awards go to ARCS Scholar Awards

ARCS Scholars Luncheon
Hosted this year by the Dean of the School of Physical Sciences, Dr. Kenneth Janda
January 14, 2016

Engineering -Dominique Ingato, Sumner Norman, Dean Gregory Washington, Caitlin Regan

Biological Sciences: Associate Dean Michael Mulligan, Nan Wu Hultgren, Allison Najafi, Dean Frank LaFerla

Check out the ARCS National Chapter News on the WEB arcsfoundation.org

ARCS® Foundation, Inc. is a national organization dedicated to supporting the best and brightest U.S. graduate and undergraduate scholars by providing financial awards in science, engineering and medical research.

The Foundation's Impact:

Support Research: 500 ARCS Scholars have conducted scientific research during their careers, 75,000 articles published in refereed journals by ARCS Scholars, 65,000 papers and major presentations made $1.5 billion in grant funding from NIH, NSF, other agencies and foundations awarded .

Foster Innovation: 6800 scientific awards have been received by ARCS Scholars , 3600 patents are registered by 1000 scholars.

Contribute to Economic Development: 1800 science-related company start-ups have been founded by ARCS Scholars, $10 billion in annual revenue generated by these companies to date.

Build the STEM Pipeline: 6200 ARCS Scholars help teach/mentor K-12 students today, 3.2 million K-12 students have been taught and mentored by ARCS Scholars, 9 out of 10 ARCS Scholars complete their degrees and work in their funded fields, more than 5000 ARCS Scholars are currently working to advance science in America.

Read more about ARCS Scholars and their impact on Science

ARCS Foundation National Annual Report October 2015 -

"Inspired and enabled by ARCS Foundation's financial support at a crucial moment in their scientific careers, ARCS Foundation's scholars are an impressive, influential and growing community."

See more in the Scholars Tab on the ARCS Web page

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