



# Orange County Chapter

August 5, 2014

## Board of Directors

**President**

Ellen M. Lewis

**President Elect**

Chandra Jain

**Immediate Past President**

Barbara Hamkalo

**Corresponding Secretary**

Toni Sullivan

**Recording Secretary**

Jackie Rojas

**Treasurer**

Kathy Kerrigan/Arzu Osborne

**Director, Membership**

Linda Crans

**Director, University and Scholar Relations**

Marie Richman

**Director, Special Events**

Regina O'Meara

**Director, Data Base Management**

Judy Greenspon

**Directors, Fund Development**

Barbara Hamkalo, Carol Malouf, Terri Carr, Catherine Emmi

**Director, Alumni Relations**

Sue Alexopoulos

Diana Casey, Co-Chair Scholar Awards Dinner

**Historian**

Teresa Rogers

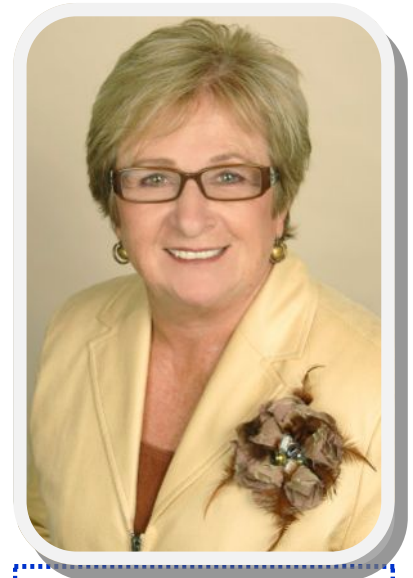
**Parliamentarian**

Catherine Kusnick, MD



## pH Reading From The President

As many of you know, Barbara Hamkalo Ph.D., served as President of The ARCS Foundation, Orange County Chapter for the past three years. Her leadership, dedication, and mentorship to our chapter have been extraordinary and commendable. We all applaud her commitment to promoting and supporting the ARCS mission of advancing science in our world today and into the future. As she transitions from the role of President and begins her new role as Immediate Past-President it is only fitting that she shares the highlights of this past year with each of you. This issue of the "pH Reading" will include Barbara's "SWAN SONG" and highlights of this past year. Here's to you Barbara.....Salute.



*Ellen M. Lewis, MSN, RN, FAAN*

*Orange County Chapter  
President, 2014-2015*

## Upcoming Events

- Sept. 17-20 National ARCS Annual Meeting-UTAH
- Sept.24, 2014 3:00 PM BOD Meeting
- October 2, 2014 6:00PM Reception, 7:00 PM The Arnold O. Beckman Family Annual Science Lecture
- Annual Scholar Dinner 3/11/2015

**ARCS Scholar Awards Dinner  
A Huge Success**

The Scholar Awards Dinner celebrated its 14th anniversary on March 4, 2014. As of this celebratory evening our Orange County Chapter has seen awards to our Scholars totaling \$2,038,000. We have come a long way from 1999. Our members should be proud of our accomplishments. But we are more proud of our ARCS Scholars!

Our 2013-2014 Scholars were all in attendance to explain their research. During the Reception our first year Scholars – Peyton Paulick, Jed Brubaker, Maria Inez Falcon, Suzanne (Suzi) Klaus and Cynthia Northrup explained their research areas to very interested guests. This year Sarkis Babikian attended the Dinner. He joined our Scholars, beginning on April 1, 2014, as our Broadcom Foundation Scholar. We look forward to hearing about his research next year at the 15th Scholar Awards Dinner.

Then we all went to the auditorium to hear our second year Scholars give 3 minute lectures regarding their research (always a challenge). Andrew Newman, Annie Vogel-Ciernia, Melinda Simon, Samuel Hallman, Virginia Liu, Matthew Dawson and Mona Wood enlightened the audience with their thesis projects in many areas of science and engineering.

Dinner followed where conversations abounded with energy and inquiry. Thank you to all ARCS members, community members, foundations and corporations who have donated funds to support our ARCS Scholars, especially to those who gave a full Award. These young people will go out into the world contributing to advancing science and technology in America. Our Chapter is very proud to have helped them on their way.

Special thanks to those who worked before and during the Awards Dinner. And a special thanks to our "honorary chapter member" – Richard Nesbit, who made our name tags.

I would like to thank Ellen Lewis for permitting me to have a few final words. The past 3 years presented many challenges, but also many rewards. The most long-lasting of these rewards are the many close friendships I've made with members of our chapter. I acknowledge and thank all the board members for their tireless efforts and dedication to our organization. Beyond Orange County I made many new close friends on the National Board. Most notable of these are the other chapter presidents, a truly impressive group of dedicated and talented women. Added to this group, are the members of the Presidents' Advanced Training Sessions (PATS) ad hoc committee that I chaired. The project was established after Pat Beckman's passing as a way to memorialize her contributions to several chapters in addition to ours and to the National Board. We proposed a coherent series of training activities to address the multitude of topics associated with the management of a non-profit organization along with resources currently available. Our project was approved by the National Board Executive Committee at the National Board meeting in June. A button will be added to the NB website to access these materials. During the course of our discussions, we realized that all chapter and board members could benefit from this program, not just the presidents. Therefore, we renamed the project "The Learning Portal" and it is dedicated to Pat Beckman's memory.



MY SWAN SONG

I am extremely proud of our current and alumni scholars who are the reason we exist. Finally, on behalf of our chapter, I thank Southern California Edison, the Beckman Coulter Foundation, the Broadcom Foundation, the Massen Greene Foundation and all our members who contribute to the Scholar Awards Fund.

By Barbara Hamkalo, Ph.D.

Immediate Past President for ARCS  
Foundation Orange County Chapter

Please don't forget ARCS-OC in your estate planning :)



## ARCS Scholars

2013-14

### Second Year Scholars

#### Biological Sciences

- ◇ Andrew Newman
- ◇ Annie Vogel-Ciernia

#### School of Medicine

- ◇ Virginia Liu

#### Engineering

- ◇ Melinda Simon

#### Information & Computer Sciences

- ◇ Samuel Hallman

#### Physical Sciences

- ◇ Matthew Dawson

#### Physical Sciences & Medicine

- ◇ Mona Wood

### First Year Scholars

#### Engineering

- ◇ Peyton Paulick
- ◇ Sarkis Babikian

#### Physical Sciences

- ◇ Cynthia Northrup

#### Information & Computer Sciences

- ◇ Jed Brubaker

#### Medicine

- ◇ Maria (Inez) Falcon
- ◇ Suzanne (Suzi) Klaus

\*2014-15 Scholars will be named in Fall \*



### A Bumper Crop of Newly-Minted PhDs

Five ARCS Scholars and two Scholar Alumnae successfully defended their PhD theses during the 2013-14 academic year. Last month you read about **Anne Kelly** and her research project. Each month, this newsletter will highlight the research of another of our new PhDs as well as the ongoing research of current scholars.

Briefly, **Andrew Newman** defended his work on blood vessel growth, a process called angiogenesis. This process plays an important role in both tumor development and tissue engineering. Andrew now works for BPS Bioscience, Inc. as a Technical Marketing Specialist. **Peyton Paulick's** thesis described the development of 3 assistive medical technologies for the aging population. Among them is a novel non-invasive direct hearing device. Peyton is currently exploring positions in R&D at medical technology companies while she explores opportunities to commercialize the hearing device. **Sara Saedinia** (our Scholar Alumna) worked on a technology for the production of highly integrated 3D devices suitable for application to a wide variety of microfluidic assays. Among the applications are analyses of biochemical components in very small samples. Sara continues to work on innovative ideas and projects while applying for a position in the biotechnology field. **Mindy Simon's** thesis focused on developing miniaturized sensors to interact with stem cells at the single cell level. As did Sara, she employed microfluidic technology (aka Lab on a Chip). Mindy is now a postdoctoral scholar at Stanford University Medical School. **Annie Vogel-Ciernia's** research represents a novel approach to the study of disorders that impair memory. She demonstrated a novel mechanism required for long-term memory formation that involves the remodeling of nucleoprotein complexes to regulate gene expression. She is headed to UC Davis as a postdoctoral scholar. As we were going to 'press', another scholar successfully defended his PhD thesis. **Matt Dawson** developed a method for measuring gas-phase ammonia and amines at the part-per-trillion level, a major advance since ambient particulate matter has been linked to cardiovascular disease, pulmonary function issues and increased incidence of lung cancer. Matt is currently a postdoctoral scholar in Dr. Dab-dub's group in Engineering at UCI. Also, congratulations to alumnus **Nicolas Mangano** who received the Special Interest Group Software Engineers (SIGSOFT Award) for Outstanding Doctoral Dissertation.



## Stem Cell Center

By Dennis Richman

ARCS members attended a lecture and tour/demonstration at the Sue and Bill Gross Stem Cell Research Center at UCI on February 26, 2014. The UCI Stem Cell Center is uniquely staffed by PhD's, MD's, and clinical technicians to develop "lab to hospital" treatment protocols for debilitating diseases such as spinal cord injuries, Alzheimer's Disease, and cancers.

Professor Peter Donovan gave a stimulating overview of the Stem Cell Center's charter that includes medical training and public awareness. The lecture prompted numerous questions regarding UCI's world class leading role in stem cell research, current medical breakthroughs, and possible timelines to introduce new medical procedures that are individually tailored to eliminate side effects and tissue rejection.

After the introduction, ARCS members donned white coats and toured the lab facilities. Professors, Medical Doctors, Post-Docs, and graduate students all worked different aspects of the Stem Cell Center's multi-faceted approach. We asked questions about the gelatinous acid used to provide a scaffold for stem cell generated organs to form correct shapes and sizes when the stem cells are not in contact with a normal body environment. Of particular interest was stem cell generation of brain cells that were then electromagnetically separated into three types so that the one type (just neuron cells) could be grown in the incubators and then used to cure some brain cancers without recurring tumors. Also of interest was microscopically seeing only a few (less than 100) stem cell generated heart cells beating on their own.

**VERY IMPRESSIVE!**

## Atmospheric Pollution Solutions

By Dennis and Marie Richman

At the annual ARCS Dinner with a Scientist on April 23, 2014, Professor Barbara Finlayson-Pitts presented a lecture and demonstration entitled **Enjoying Air We Can't Chew**. Among other distinctions, she is a member of the National Academy of Sciences and the American Academy of Arts and Sciences. She is the founding Director of an Organized Research Unit, AirUCI (Atmospheric Integrated Research at UC Irvine). One of our current ARCS Scholars, Mathew Dawson, is conducting his Ph.D. research in her group.

Professor Finlayson-Pitts described her current research efforts in the context of climatic change issues such as those attributed to volatile organic compound (VOC) reactions in the atmosphere and explained the ozone paradox: In the upper atmosphere, ozone protects life on Earth from ultraviolet radiation but at the surface it damages human lung and plant tissues. Her demonstrations included a flask of ozone and lemon peel to show that even natural VOC's such as terpenes from tree sap can react to form the particulates that cause haze in the Blue Mountains. Next she showed how ozone destroys elastic materials as in rubber bands and tires by breaking their polymeric bonds, causing them to harden, become brittle, and then shatter. Finally, Professor Finlayson-Pitts demonstrated in a large glass flask how clear oxides of nitrogen created from car engine combustion react with air to create brown smog and additional ozone.

The lecture and demonstration focused on man-made causes of accelerated climatic change as well as possible solutions. Professor Finlayson-Pitts noted past successes in addressing atmospheric issues at both the regional level (reducing smog in Southern California) and the international level (shrinking the ozone hole discovered by UCI's Nobel Laureate Professor Sherwood Rowland). Because of our success in improving air quality, although the number of cars on the road has doubled, the concentration of ozone at ground level has been reduced by a factor of three. International cooperation has resulted in a shrinking of the ozone hole in the upper atmosphere that was caused by chlorofluorocarbons used as refrigerants and cleaning solvents. These successes raise the hope of addressing human contributions to climate change, but the time required to see the impact of reducing CO<sub>2</sub> emissions to pre-industrial revolution levels, even if that is achievable, will exceed our lifetime.



## Arnold O. Beckman Family Science Lecture and Dinner 2013 Elizabeth H. Blackburn

We were fortunate to have **Dr. Elizabeth H. Blackburn** as our featured speaker last December. Liz is the Morris Herzstein Professor of Biology and Physiology in the Department of Biochemistry and Biophysics at the University of California, San Francisco. Her biochemical and molecular studies that unraveled the structure of chromosome ends, telomeres, and the mechanism of action of the enzyme that maintains telomeres, telomerase, earned her the 2009 Nobel Prize in Physiology and Medicine, along with her ex-graduate student, Carol Greider. Barbara McClintock published many papers as early as the 1930s describing the instability of broken chromosome ends resulting in chromosome fusions using light microscopy. In contrast, the natural ends of chromosomes are stable. However, the biochemical/molecular nature of telomeres was a mystery until Liz's breakthrough studies. In her lecture Liz took us on a tour of a plethora of biological phenomena that can be explained by either the inactivation or reactivation of telomerase. Among these are cancer, typically accompanied by telomere reactivation and aging, typically accompanied by inactivation of telomerase, hence creating ever shortening telomere ends. Work in Liz's laboratory over the past several years has extended studies in a variety of directions. This work is an outstanding example of the importance of interdisciplinary research.

In addition to the lecture, ARCS scholars organized a meeting with Liz, which was open to all graduate students. This fall, we will name an Elizabeth Blackburn Scholar, supported by several of our members and friends.

# SCHOLAR FEATURE



## **Jed Brubaker**

Jed Brubaker is a Ph.D. candidate in Informatics in the Donald Bren School of Information and Computer Sciences at UC Irvine (UCI), where he researches the design of identity-related technologies and the experiences they enable. His dissertation focuses on our “digital afterlives” and how to improve the management of accounts and personal data after we die. Brubaker’s research has been published widely, has been nominated for best paper awards three times, and his research has been featured in national and international press. He received an NSF Graduate Research Fellowship honorable mention and was named UCI’s Most Promising Future Faculty Member for 2013. Brubaker earned his M.A. at Georgetown University in Communication, Culture and Technology, and previously graduated Summa Cum Laude with a B.S. in Psychology from the University of Utah. He currently holds

appointments with Facebook and with the Intel Science and Technology Center for Social Computing.

As to the focus of Jed’s dissertation research: Death challenges many of the assumptions we hold for user accounts, social media, and digital identity architecture more generally. By studying death in the context of social media, Jed’s work aims to help us better understand how people interact with and experience digital identity systems, demonstrate limitations of current architecture, and in turn, better enable social systems to support the entirety of our lives -- including when those lives come to an end.

Jed has spent four years focusing on people’s experiences and attitudes about death on social network sites, documenting how sites like Facebook are changing the contemporary American experience of death. Most recently, he is focusing on the pragmatic question of what we do with people’s accounts and data when they die. The common approach is to treat accounts and data as assets that can be included in a will and trust and bequeathed to a loved one. However, Facebook profiles are more than a collection of assets -- they are digital identities -- and Jed was struck by the strangeness of “giving away” an identity. During user research, he found that heirs did not talk about ownership. Instead they talked about caring for the deceased digital identity, and for the community the deceased left behind. Based on this, he proposes “stewardship” as an alternative model to inheritance that focuses on the needs of those who care for the people and data we leave behind. He is currently in the process of developing stewardship-based prototype systems and working directly with Facebook to implement stewardship for the 1.3 billion people who connect, socialize, and even grieve on the world’s largest social network. An impressive goal!

ARCS funding has helped Jed scale his work on three fronts: data collection, system design and implementation, and dissemination. ARCS support has allowed him to scale data collection by covering a variety of research expenses from participant compensation and transcription to analysis. In turn, improved data collection positioned him to be ready to design and implement design prototypes based on his research findings. On this front, he is using ARCS funding to pay for the technical expenses associated with developing and hosting these systems. Finally, he has used ARCS funding to help fund travel to various conferences and venues where he has shared his work. In particular, his collaboration with Facebook might not have come into fruition were it not for the ability to visit Facebook and share his work in person.

Authored by Ann Brown  
President of ARCS  
Foundation, Colorado



## IMPACT of ARCS Foundation Scholar Awards

ARCS® Foundation is a national organization of women committed to advancing science in America through raising funds for scholar awards. These awards go to promising graduate and undergraduate students who are pursuing degrees in science, engineering and medical research.

With 17 Chapters nationwide and 1520 volunteer members, we have awarded over \$87 million to 8900 scholars since 1958. We have 54 Partner Universities with 587 University Departments. Our Chapter Endowments total over \$17 million to help perpetuate our efforts. Below is a summary of the impact of this investment to:



### Support Research

- 7500 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

(Above information is derived from 2013 Scholar Survey)



ACHIEVEMENT REWARDS FOR COLLEGE SCIENTISTS

We are on the web

[https://www.arcsfoundation.org/orange\\_county/](https://www.arcsfoundation.org/orange_county/)

## Contact Info

ARCS Foundation, Inc  
Orange County Chapter  
P.O. Box 10942  
Newport Beach, CA 92658-0942

E-mail: [orangecounty@arcsfoundation.org](mailto:orangecounty@arcsfoundation.org)

If your personal interests align with ARCS' Mission and you would like information about membership, please email **Linda Crans** at [LLcrans@yahoo.com](mailto:LLcrans@yahoo.com)



## Mission Statement

The ARCS Foundation advances science and technology in the United States by providing financial awards to academically outstanding U.S. citizens studying to complete degrees in science, engineering, and medical research.

## Acknowledgements

Thank you Barbara Hamkalo, Sue Alexopoulos, Dennis and Marie Richman for contributing content featured in this newsletter edition.

## Preview of Guest Speakers

### The Arnold O. Beckman Family Annual Science Lecture & Reception

#### Eyal and Leya Aronoff

Eyal traces his interest in autism to the time his daughter Leya was diagnosed with autism at age two and a half.

When Leya was eight, she was treated with Sensory Enrichment Therapy that enabled her to overcome the barriers that kept her behind. However, even after Leya overcame the symptoms of autism, she did not find her "voice" until age thirteen, when she discovered poetry. Today, Leya is a vibrant young woman. Her autism is but a distant memory.

Read more about these speakers in the next edition of the "pH Reading" and at

[www.mendability.com](http://www.mendability.com).

<http://andseewhereittakesyou.tumblr.com>

## 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**.





• Orange County Chapter •