

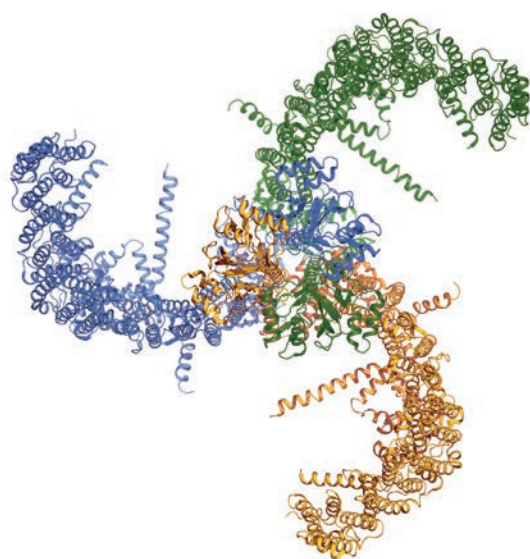


# ANNUAL REPORT 2021 - 2022

# ACHIEVEMENT REWARDS for COLLEGE SCIENTISTS MISSION

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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.



Microscopic image of Piezo1, an ion channel protein associated with pressure, sensation and touch, which was the focus of Nobel Prize winner and 2022 Scientist of the Year (SOY) Dr. Ardem Patapoutian's work for 20 years at Scripps Research. ARCS member Janet Hubka, CEO of ilus Art, used this image to create a unique piece of art, which she presented to Dr. Patapoutian in thanks for his keynote speech at our 2022 Virtual SOY Event.



The ilus Art process:

"We create artwork from the images that scientists take to quantify their research. We do not alter the image or change the color - the scientist is truly the "artist"! Typically, fluorescent dyes are used in the research lab so the scientist and their team can identify the different structures in the cells. When infused into metal, the pictures take on a luminescent quality which scientists say closely resembles what they see when they look through the eye of the microscope. In creating the picture for Dr. Patapoutian, I worked with his lab manager to identify an image that has great meaning to him and represents the work which won the Nobel Prize. The image, together with an accompanying plaque, were produced on metal creating a lasting commemorative gift for our renowned SOY."

## MESSAGE FROM THE PRESIDENT

Wow, what a year! While we were no longer in strict lockdown, we weren't quite back to normal either. I think of this as a transition year—still doing business remotely and virtually for the most part, with a few in-person events, which we now treasure and appreciate. In spite of the continuing challenges of COVID and its variants, we are grateful that we were still able to recruit accomplished and energetic members and to continue to break fund-raising records this year.

One of our major highpoints was honoring Dr. Ardem Patapoutian, a professor of neuroscience at Scripps Research, as our 2022 Scientist of the Year (SOY). Dr. Patapoutian was awarded the Nobel Prize in Medicine or Physiology in 2021 for his ground-breaking work regarding the sense of touch and sensation, and the discovery of two ion channels, Piezo1 and Piezo2, the first of which is pictured on the opposite page.

Thanks to our members, friends, and especially our academic partners, we were able to reach new milestones in all three of our fund-raising components: 1) our SOY net was \$166,000; 2) our annual member giving campaign brought in over \$122,000 with 85% of our members participating; and 3) we received more than \$275,000 in grants and major gifts! All monies raised go directly to our Scholars! We are absolutely humbled by your generosity and support. Thank you!

Our field trips—mostly virtual due to COVID—brought our Scholars, Scholar alumni, friends, and members into the fold and increased our name recognition and footprint. We were treated to a tour of the new Rady's Shell at Jacobs Park, learned about music and the brain from Dr. Ani Patel, and gained insight into cyber security for homes and businesses from Mark Rotarius at Fortress Networx. Finally, we were able to learn

more about the smell/taste loss associated with COVID from Carol Yan, an ENT surgeon at UC San Diego Health, and Julie Carty, one of her patients.

Another new activity has been our "Pop-up Parties," which took place in members' homes. The fun of simply being together in person, meeting new and long-time members, and having our Founders in attendance, was special.

In addition, there have been several silver linings as a result of changes required by COVID:

- Thanks to our virtual format, we have had the opportunity to connect with the 600+ Scholar alumni that we have discovered via social media.
- We have enjoyed increased cooperation and collaboration with ARCS National and the other 14 chapters across the country.
- We have established cross-chapter Collaboration Networks, focused on eight administrative areas of the ARCS organization, that have led to many operational improvements and the benefit of meeting many wonderful, dynamic women, who support the advancement of science and technology in our country.

Could there be a better time and opportunity to support ARCS, our Scholars and our mission? I have been honored and delighted to have served as the president of our chapter for the past three years. I have been blessed with a fabulous team (yes, it does "take a village")! Your friendship, support and encouragement have been invaluable to me.



With deep gratitude to all for your continued support of ARCS and our Scholars,

HOLLY HEATON, RN, JD  
President 2021-2022



# WHO WE ARE: THE HISTORY of ARCS

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October 4, 1957 was a game-changer. On that date, Russia launched Sputnik, a 183-pound satellite, roughly the size of a beach ball, into space. This surprise launch shocked the United States and forced it to rethink its place as the technological leader of the world. It also ushered in the Space Age and the Cold War. The Russian action touched all areas of America, including politics, patriotism, science, the military, and education. In response, the U.S. undertook an unprecedented push to educate Americans in science and math.

As part of that initiative, a group of women in Los Angeles saw the opportunity to make a difference by creating a partnership between science and society. Their goal was to re-establish and re-energize the technological superiority of the United States. They started the first ARCS chapter in September 1958. ARCS (Achievement Rewards for College Scientists) is a nationally recognized nonprofit organization founded and administered by women who volunteer their time and talent to support American advancement in STEM (science, technology, engineering and math) and in biomedical research. It is now comprised of 15 chapters across the nation.

In 1985, four San Diego women established ARCS Foundation San Diego: Karen Bowden, Karon Luce, Barbara McColl, and Pattie Wellborn. Thirty-seven years later, ARCS San Diego has provided over \$11 million in financial awards to the brightest STEM scholars at four local academic institutions. By investing in these scholars, we are securing a better future for American and the world.

## FACTS AT A GLANCE

**106** CURRENT MEMBERS

**1985** CHAPTER STARTED WITH 4 FOUNDERS

**\$11,802,000** FUNDED SINCE 1985

**50** SCHOLARS AWARDED **\$455,000** IN 2020-2021

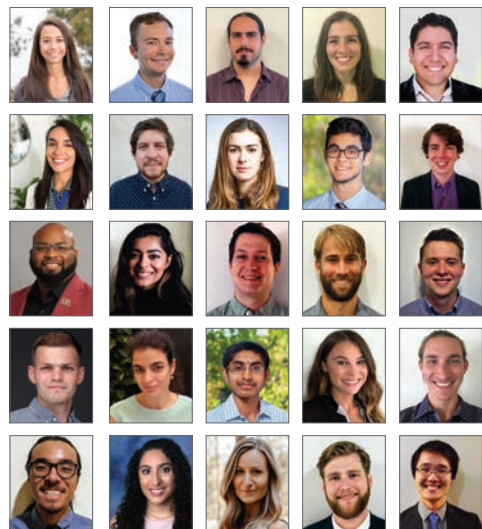
**98%** GRADUATION RATE



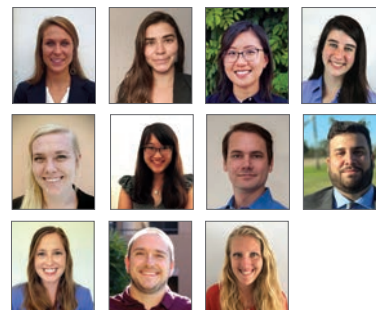
# OUR SCHOLARS ... TOMORROW'S LEADERS

## 2021-2022 ARCS SAN DIEGO CHAPTER SCHOLARS

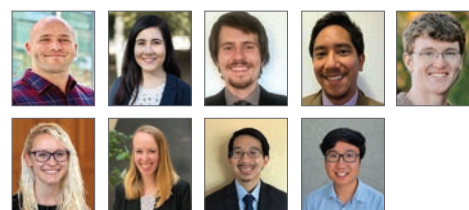
### UNIVERSITY OF CALIFORNIA, SAN DIEGO



### SAN DIEGO STATE UNIVERSITY



### SCRIPPS RESEARCH



### UNIVERSITY OF SAN DIEGO



We are so proud of our Scholars. We continue to be amazed by their hard work, dedication, and resilience while enduring a second year of the coronavirus pandemic, which meant continued mask wearing, remote learning and social distancing, to name only a few of the hardships. We are also grateful for our academic partners - UC San Diego, San Diego State University, Scripps Research and the University of San Diego – who choose our Scholars and who are approved by the ARCS National Board on the basis of excellence in basic science, engineering, math and medical research.

Our Scholars are all PhD candidates and are conducting research and making new discoveries that will lead to advances in global health and wellness, understanding and treatment of disease, national security, ecological improvements, space exploration and many other STEM areas.

We are proud to volunteer our time to promote scientific advancement in our country and provide unrestricted funds to tomorrow's leaders. 100% of our contributions go directly to our Scholars, not to administration or infrastructure. ARCS is one of the largest contributors to basic science education of any private membership organization in the United States.

# SCHOLAR SELECTION

Scholars must be U.S. citizens and meet ARCS-established academic criteria with a minimum 3.5 GPA, while pursuing undergraduate and graduate degrees in a wide range of scientific subjects. These Scholars are specializing in astronomy, biochemistry, botany, cell and molecular biology, chemistry, computer science, ecology, engineering, genetics, marine biology, mathematics, medical research, oceanography, physics and more.



**AMANDA THERESE ALKER**

**SDSU/UC SAN DIEGO**

College of Sciences

Concentration: Cell and Molecular Biology

Specialization: Environmental Microbiology



**SERGIO RODRIGUEZ LABRA**

**SCRIPPS RESEARCH**

Skaggs Graduate School of Chemical and Biological Sciences

Concentration: Biomedical Science

Specialization: Translational Neuroscience



**JERVAUGHN DEANTHONY HUNTER**

**UCSD**

Jacobs School of Engineering

Concentration: Bioengineering

Specialization: Tissue Engineering and Regenerative Medicine



**PATRICIA JINHAЕ MAGDALUYO**

**USD**

Hahn School of Nursing and Health Sciences

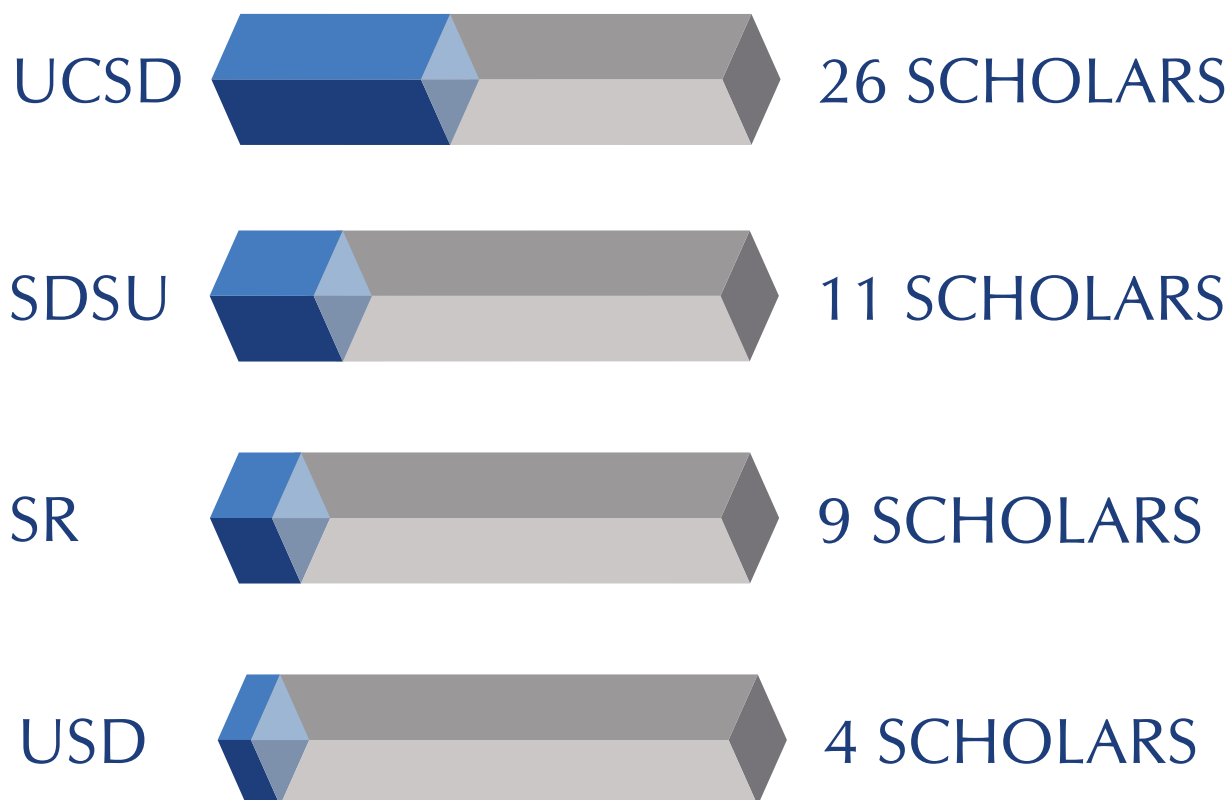
Concentration: Nursing

Specialization: Oncology Patient Experience



The amount of funding available for ARCS Scholar Awards is calculated each year by using a distribution formula based on the percentage of eligible Scholars enrolled at each ARCS-approved recipient university.

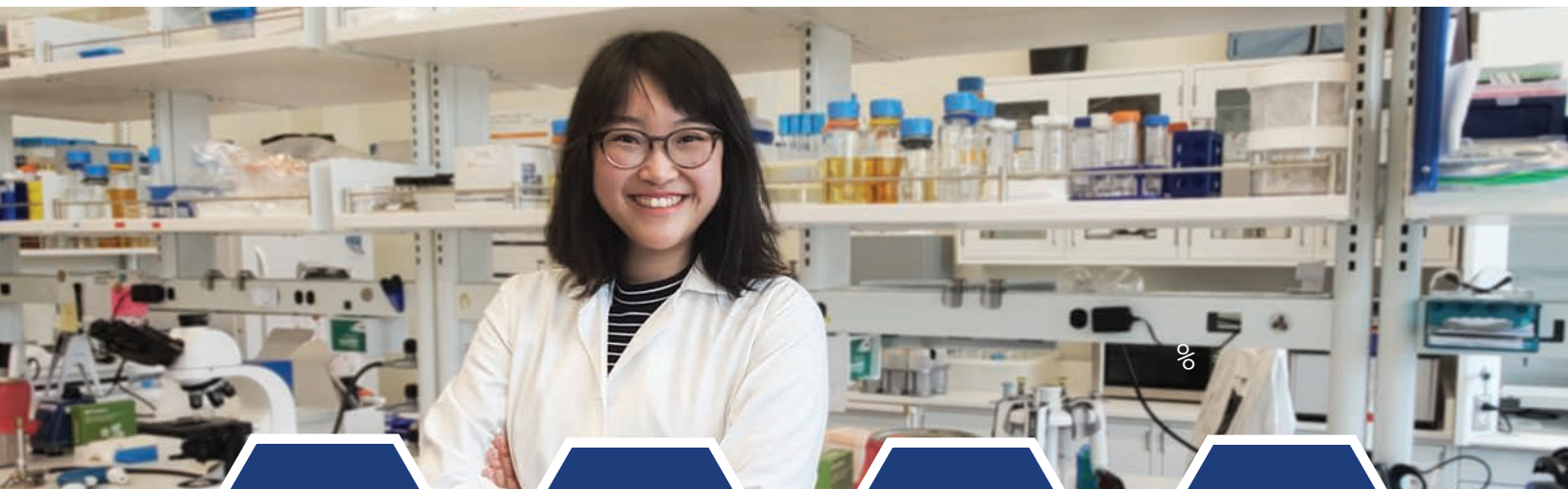
The **2021-2022 academic year awards** were allocated as follows:



# ARCS SAN DIEGO

## CUMULATIVE FUNDING 1985-2022

TOTAL AWARDS GRANTED 1,584  
TOTAL FUNDING \$11,802,000



\$6,337,500

809  
AWARDS

UC San Diego

\$3,594,500

482  
AWARDS



\$1,215,000

203  
AWARDS



\$655,000

90  
AWARDS





# 2022 SCIENTIST of THE YEAR VIRTUAL EVENT

As the saying goes, “third time’s a charm,” and so it was for our third virtual SOY event presented as a YouTube Premiere on April 24th, 2022. Not only were we thrilled to be honoring a newly minted Nobel laureate, we were also so impressed by the talent and dedication to science that were on full display among our Scholars and Scholar alumni. We were also incredibly grateful to our members and sponsors who helped us raise over \$170,000 for our Scholars! Definitely one for the history books!



**ARDEM PATAPOUTIAN, PhD – 2022 SCIENTIST OF THE YEAR** | Dr. Patapoutian is a molecular biologist and professor in the Dorris Neuroscience Center at Scripps Research. He shared the 2021 Nobel Prize in Physiology or Medicine for his research into how the body senses touch and other mechanical stimuli. Dr. Patapoutian grew up in Lebanon during the civil war. He studied chemistry at the American University of Beirut before fleeing to the United States at age 18 with hopes of becoming a doctor, but while studying at UCLA he fell in love with basic research.



**ARYN GITTIS, PhD – ARCS SCHOLAR ALUMNI SPEAKER** | Dr. Gittis is a neuroscientist in the Department of Biological Sciences at Carnegie Mellon University, whose research focuses on neural circuits in the basal ganglia, a multifunctional brain region that plays a role in the regulation of movement, learning, motivation, and reward. She is interested in how basal ganglia circuits are altered by experience and why some circuits break down in movement disorders such as Parkinson’s disease and dystonia.



**JULIA NUSSBACHER, PHD – ARCS SCHOLAR ALUMNI SPEAKER** | Dr. Nussbacher is an RNA biochemist and bioinformatician. She has worked at San Diego biotech company Locanabio since May of 2019 as their lead bioinformatician, managing all next-generation sequencing and analysis, as well as the Laboratory Information Management System for all of research and development. She also develops informatics pipelines to analyze the efficacy and specificity of Locanabio’s RNA-targeting CRISPR gene therapies for neurodegenerative, neuromuscular, and retinal diseases.

“NOBEL” TITLE SPONSOR

**UC San Diego**

GOLD SPONSORS



**SAN DIEGO STATE  
UNIVERSITY**



**Scripps Research**

# BENEFITS of ARCS MEMBERSHIP

ARCS members have the opportunity to actively engage with Scholars and academic partners at presentations, lab and site visits, and social events. Members also enjoy learning about cutting-edge technologies and establishing relationships with Scholars. In 2021-2022, due to the ongoing pandemic, most of these activities took place via Zoom.



Photo Credit: The Rady Shell

**THE RADY SHELL AT JACOBS PARK** | ARCS members and guests attended a field trip to the Rady Shell at Jacobs Park. The tour was presented by the San Diego Symphony Technology Team, who provided information on the many facets of this iconic new venue by San Diego Bay. Following the tour we had a delicious prearranged lunch at the Prebys Plaza.



Photo Credit: Jon Chase/Harvard Staff Photography

**MUSIC, EVOLUTION, AND ANIMAL RESPONSES TO MUSIC** | Zoom presentation by Dr. Aniruddh (Ani) Patel, Professor of Psychology at Tufts University, on the cognitive, neural, and evolutionary foundations of music. "Is human musicality an innate ability or a cultural invention?" was one of many intriguing questions Dr. Patel explored with us during his fascinating talk.



**COVID'S TOLL ON TASTE AND SMELL** | Zoom presentation by Dr. Carol Yan, a renowned rhinologist at UC San Diego Health, and one of her patients, Julie Carty, to discuss the latest research and treatments for anosmia and parosmia. One of the many mysteries surrounding COVID-19 is the peculiar side effect of patients losing their sense of taste and smell. In the medical field, it's called anosmia. A less publicized side effect that follows many COVID-19 patients is parosmia, which is when scents and flavors become distorted, e.g., lemons may taste like sewage!



**CYBERSECURITY – BEST PRACTICES** | Zoom presentation by Mark Rotarius, Operations Manager and Senior Engineer at Fortress Networx, on the important and timely topic of "Cyber Security: Best Practices for Personal Computers and Devices." We learned about phishing attacks, data protection, malware, creating strong passwords and more.

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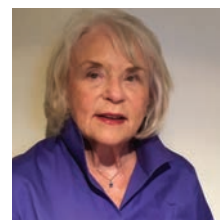
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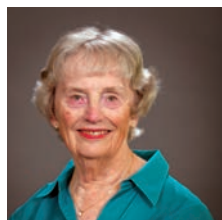
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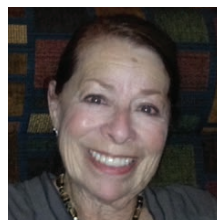
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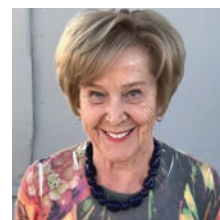
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# 2021-2022 DONOR HONOR ROLL

JULY 1, 2021 – JUNE 30, 2022  
GIFTS RECEIVED FOR AWARDS TO BE MADE IN THE ACADEMIC YEAR  
2022-2023

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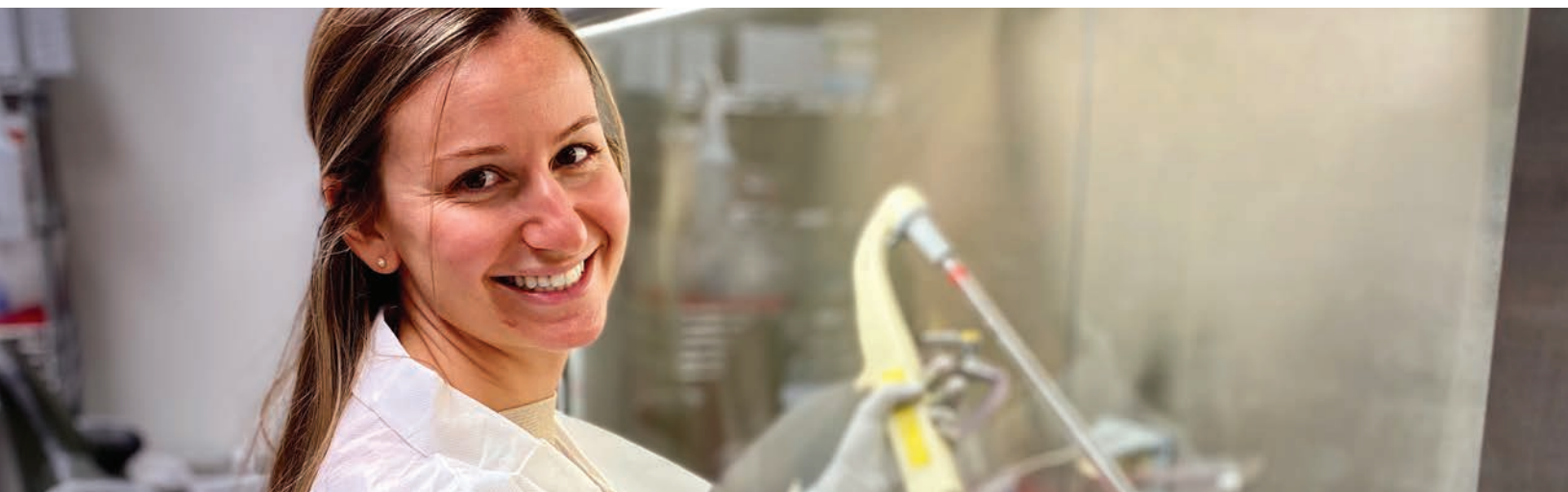
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## IN-KIND

ilus Art  
Scripps Research

The amounts above indicate donations to the ARCS Foundation Scholar Awards Fund, Endowment Fund and Memorial Funds.

See an error or omission? Please send an email to: [sandiego@arcsfoundation.org](mailto:sandiego@arcsfoundation.org)



# OUR ALUMNI—CHANGING THE WORLD!

Thousands of ARCS Scholar alumni go on to make outstanding contributions to advance science and keep America competitive. Here are just a few standouts in 2021-2022 from our chapter.



**SHADI SAMI, MS (1998 ARCS SCHOLAR, SDSU)** is currently the Principal Civil Engineer for the City of Poway, where major changes to the water system are in the works. November 2020, soon after Shadi was hired, the Poway City Council approved several steps to initiate a massive water improvement program for the city. This was prompted by a 2019 crisis when the city's water supply was contaminated by storm water. The program consists of several parts, but would ultimately replace the city's existing, decades-old clear well with new storage reservoirs. It would also connect the city with the San Diego Water Authority's treated water, creating treated water pipelines, a pump station and forebay. "It's the largest capital improvement program the City of Poway has ever undertaken," Shadi reported to ABC 10News in June 2021, when the project was set to begin.



**JACOB SENDOWSKI, PHD (2006-2007 ARCS SCHOLAR, UCSD)** received his BS in Electrical Engineering at UCSD. He went on to earn his MS and then a PhD in Electrical Engineering from Caltech and immediately got a job in the research and development department at Intel. Despite his extensive education in electrical engineering, Jacob admits he always had an interest in business and entrepreneurship. He discovered a new calling while in the grocery store with his wife Michelle and later presented Souper Cubes® on Shark Tank, which aired on February 19, 2021. They made a deal with Entrepreneur and Investor Lori Greiner, who gave them her infamous "golden ticket" for the best "hero item" pitched during a season, plus \$400,000 for a five percent stake in the Souper Products Company. The Sendowskis are now selling their products in 800+ Bed, Bath, and Beyond stores across the US and in Canada.



**MYA BREITBART, PHD (2006, UCSD/SDSU)**, professor and microbiologist at the University of South Florida College of Marine Science, is among 15 prominent scholars from throughout the state of Florida who were selected for membership to the Academy of Science, Engineering and Medicine of Florida (ASEMFL) in May 2022. The ASEMFL brings together the nation's most distinguished scholars who live and work in Florida. Breitbart was selected for her pioneering research in the field of viral metagenomics.

# INVESTING IN AMERICA'S FUTURE



Join us to support ARCS Scholars and invest in the future of science, technology, research and innovation in America. The Scholar Award Fund is supported by ARCS members, foundations, academic institutions, businesses, and individuals in the community.

**Give online at [san-diego.arcsfoundation.org](https://san-diego.arcsfoundation.org)**

**Donations by check may be mailed to:**

ARCS Foundation, Inc. – San Diego Chapter

Attn: Christine Diaz, 207 West D Street, Encinitas, CA 92024

All gifts are tax-deductible and greatly appreciated by our members, the Scholars and their academic institutions.

**100%** OF EVERY DONATION GOES TOWARDS SCHOLAR AWARDS

To make a donation of stock, create an endowment, include ARCS in your Estate plans, or request additional information, please contact:

Kathe Albrecht, President | [kalbrec@gmail.com](mailto:kalbrec@gmail.com)

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ARCS Foundation is a national nonprofit organization administered entirely by women.

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