

Arnold and Mabel Beckman Foundation 2022 Annual Report

**SUPPORTING YOUNG SCIENTISTS TODAY
FOR TOMORROW'S BREAKTHROUGH DISCOVERIES**



F O U N D A T I O N

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Our Mission

Dr. Arnold O. Beckman and his wife Mabel established the Foundation to support leading edge research in the fields of chemistry and life sciences, broadly interpreted, and particularly to foster the invention of methods, instruments, and materials that open up new avenues of research and application in those disciplines and related sciences.



On the cover: 2022 Orange County Beckman Legacy Awardee, Pranav Mehta, presents his research at the 2022 Beckman Symposium at Caltech titled 'Comparing anthocyanin concentration between organic and nonorganic red onions'.

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Positive Changes

A Message from the Executive Director

Dear “Beckman Family” and Friends,

After the multitude of challenges that 2020 and 2021 threw at us, we welcomed 2022 and the ability to balance a gradual return to in-person events and continuing to connect with each other using our technology skills.

This year’s headliner was **Dr. Carolyn Bertozzi** (’98 BYI) whose groundbreaking work in bio-orthogonal chemistry was recognized with the **2022 Nobel Prize in Chemistry** and the 2022 Wolf Prize. Congratulations Dr. Bertozzi on these amazing accomplishments!

And after two years of virtual “gatherings”, we were happy to welcome the Beckman Young Investigators back to Irvine for a two-day summit and poster session, and we also hosted seven(!) Regional Symposia at locations across the U.S. for all of our grant awardees to share their research progress with peers. This year we are looking forward to once again holding our full group meeting in Irvine in August 2023.

Last year, **Dr. Jeff Moore** announced that he was resigning as Director of the Beckman Institute at University of Illinois, Urbana-Champaign. We thank him for his dedicated service to the Institute and are equally pleased to welcome **Dr. Nadya Mason** as the newest Beckman Institute Director.

We mourned the passing in September of **Dr. Michael Berns**, the inaugural Director of the Beckman Laser Institute and Medical Clinic. Dr. Berns was a pioneer in using laser technology in biological and medical applications (biophotonics), and he partnered with Dr. Beckman to establish the Beckman Laser Institute and Medical Clinic on the UCI campus.



Anne Hultgren, PhD

A handwritten signature in black ink that reads "Anne Hultgren". The signature is fluid and cursive, with a large loop at the end of the last name.

We also saw several Foundation leadership changes in 2022. In May, we welcomed two new members to our Board of Directors, **Dr. David Hollander** and **Mr. Shlomi Nachman**, both of whom bring extensive knowledge from biotech and start-up industries. Three Board Members retired at the end of their respective terms: **Mr. Jon Fosheim** and **Mr. Peter Simon** in May 2022, and **Mr. Gary Wescombe** in December 2022, after 25 years of service to the Board.

Finally, congratulations to **Dr. Andrew Lyon** (2000 BYI) who was elected to serve a three-year term as Chair of the Board of Directors! Dr. Lyon has given his time and expertise to the Foundation as a proposal reviewer, member of the Scientific Advisory Council, and Board Member for seven years. I’m sure we will benefit from his leadership during his term as Chair.

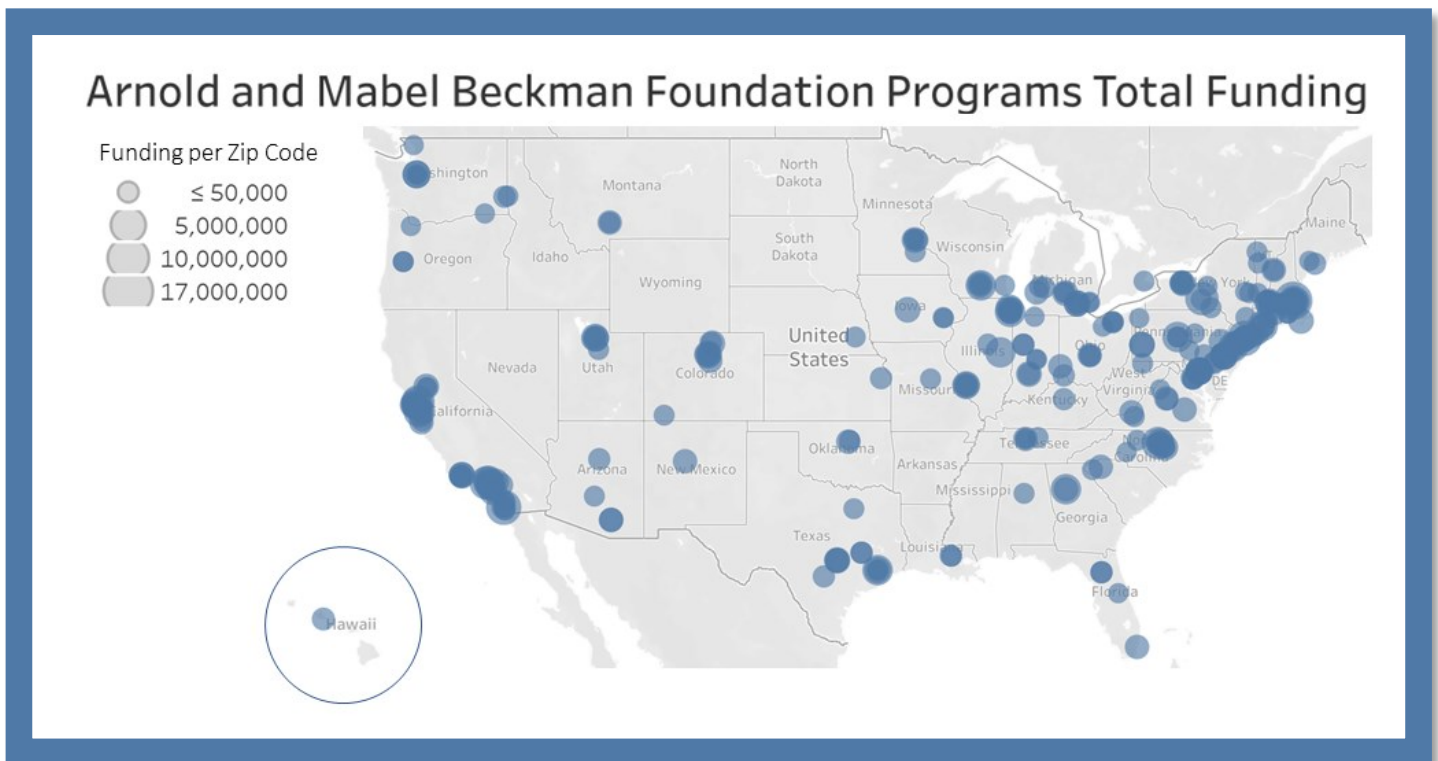
We look forward to the year ahead and celebrating the changes that this year will bring!

Did You Know?

The Foundation's annual grant programs started in 1991 with the Beckman Young Investigator program, and over the ensuing 32 years, we have exceeded

\$225,000,000

in research grants across the United States that support undergraduate students, postdoctoral fellows, junior faculty, and special awards for advanced instrumentation and vision science breakthroughs!



**Note: Map does not include grants for construction or annual funding for the Beckman Institutes and Centers.*

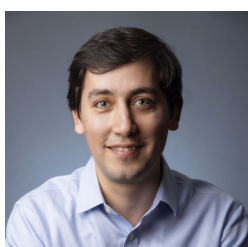
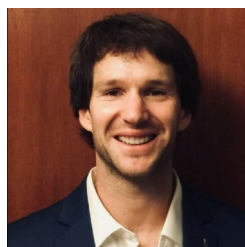
AWARDEE

Awardee Highlights from the Past Year



Carolyn Bertozzi, PhD
1998 Beckman Young Investigator

Received the Nobel Prize in Chemistry for the development of click and biorthogonal chemistry. Additionally, Carolyn Bertozzi won the Wolf Prize in Chemistry. The \$100,000 prize is awarded to outstanding scientists and artists around the world for achievements in the interest of mankind.



John Blazeck, PhD 2019 & Hadi Nia, PhD 2022 Beckman Young Investigators

Received the 2022 NIH Director's New Innovator Award for 1.5 million.



Martin Burke, PhD 2008; Guoping Feng, PhD 2002; Steven Little, PhD 2008; Kim Orth, PhD 2003; Charles Sykes, PhD 2008 Beckman Young Investigators

Five Beckman Young Investigators elected Fellows of the American Association for the Advancement of Science.



Carl Brozek, PhD
2007 Beckman Scholar

Named a 2022 Cottrell Scholar. The Research Corporation for Science Advancement awarded twenty four early career scholars. Each awardee receives \$100,000 to fund their research.



Matthew Jones, PhD
2015 AOB Postdoctoral Fellow

Received an NSF CAREER Award. The five year grant for more than \$650,000, will support the research of Dr. Jones in the fundamental processes of nanoparticle formation.

HIGHLIGHTS

Awardee Highlights—cont'd.



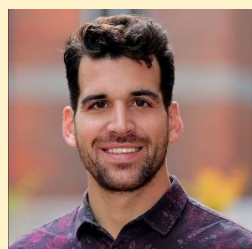
Pamela Chang, PhD
2017 Beckman Young Investigator
Awarded a 2022 Sloan Research Fellowship in Chemistry from The Alfred P. Sloan Foundation. Winners receive \$75,000.



Tania Lupoli, PhD
2004 Beckman Scholar & 2021 Beckman Young Investigator
ACS Infectious Disease/ACS Division of Biological Chemistry Young Investigator.



Dan Minor Jr, PhD 2002 & Nancy Carrasco, PhD 1991 Beckman Young Investigators
Named 2023 Fellows of the Biophysical Society.



Frank Leibfarth, PhD
2019 Beckman Young Investigator
Awarded the 2022 Journal of Polymer Science Innovation Award.



Jarad Mason, PhD
2019 Beckman Young Investigator
Awarded a 2022 Moore Inventor Fellow.



Robert Gilliard Jr., PhD
2021 Beckman Young Investigator
Awarded the 2022 Lloyd N. Ferguson Young Scientist Award for Excellence in Research.



Jasmine Esparza
2019 Beckman Scholar
Awarded the 2022 Ford Foundation Predoctoral Fellowship.



Leslie Schoop, PhD
2019 Beckman Young Investigator
Awarded the 2021 Office of Naval Research Investigator Award.



Above: 2019 Arnold and Mabel Beckman Foundation's Board of Directors. Top row (l—r): Dr. Jeff Johnston, Dr. Andrew Lyon, Mr. William May, Mr. Gary Wescombe, Dr. Larry Kline. Bottom row (l—r): Mr. Jon Fosheim, Mrs. Lynn Rahn, Mr. Steve Pizula, Mrs. Jackie Dorrance, Mr. Peter Simon, Dr. Deborah Wuttke.

I. Foundation Leadership

“Hire the best people and then get out of their way.” - Dr. Beckman

We're grateful to the team of individuals who dedicate themselves to the success of the Arnold and Mabel Beckman Foundation, including:



F O U N D A T I O N

Board of Directors

Dr. Jane Buchan, PhD
 Mrs. Jacqueline Dorrance (Secretary)
 Mr. Jon Fosheim
 Dr. David Hollander, MD
 Dr. Jeffrey Johnston, PhD (Vice-Chair)
 Dr. Lawrence Kline, MD
 Dr. Andrew Lyon, PhD & '00 BYI (Chair-Elect)
 Ms. Kristen Monson
 Mr. Shlomi Nachman
 Mr. Steven Pizula
 Mrs. Lynn Rahn (Treasurer)
 Mr. Peter Simon
 Mr. Gary Wescombe (Past Chair)
 Dr. Deborah Wuttke, PhD & '99 BYI

LEADERSHIP

Foundation Staff

Ms. Catrina Bryant, BA
Ms. Jackie Chamberlin, CIMA, CPA
Ms. Esther Devanney, BS
Mrs. Tiana Godges, BA
Dr. Anne Hultgren, PhD
Ms. Elizabeth Koppe, BA
Mrs. Nicole Patras, BA
Ms. Kaerie Ray, MBA

Scientific Advisory Council

Dr. Annaliese Franz, PhD
Dr. Kent Hill, PhD (Co-Chair)
Dr. Philip LeDuc, PhD
Dr. Anne McNeil, PhD (Co-Chair)
Dr. Karl Mueller, PhD
Dr. Kim Orth, PhD
Dr. Jason Shear, PhD

The Foundation's Program Executive Committees are instrumental in leading the proposal review committees, developing final award recommendations, and conducting annual assessments of the program requirements. Our special thanks to the 2022 Executive Committee members:

BYI Executive Committee

Dr. Rae Anderson, PhD
Dr. Sean Elliot, PhD
Dr. Julianne Grose, PhD
Dr. Shiv Halasyamani, PhD
Dr. Ke Hu, PhD
Dr. Peng Jin, PhD
Dr. Jonathon Lai, PhD
Dr. Jonathon Wilker, PhD

AOB Postdoctoral Fellows Executive Committee

Dr. Carolyn Anderson, PhD
Dr. Steven Leone, PhD
Dr. George O'Doherty, PhD

BSP Executive Committee

Dr. Nicholas Ball, PhD
Dr. Ming Hammond, PhD
Dr. Laura Hunsicker-Wang, PhD
Dr. Margaret Saha, PhD

OC Beckman Legacy Executive Committee

Dr. Noreen Galvin, PhD
Dr. Brian Goess, PhD
Dr. Peter Nemes, PhD
Dr. Christina Stallings, PhD



Above: Lead halide perovskite in the lab of 2017 BYI Erik Grumstrup, PhD.

II. Beckman Young Investigator Program

The Beckman Young Investigator (BYI) Program provides four years of research support amounting to \$600,000 to promising young faculty members in the early stages of their academic careers in the chemical and life sciences, broadly defined, who have not yet received a major award from another organization.

Projects must be truly innovative, high-risk, and show promise for contributing to significant advances in chemistry and the life sciences, with preference to those that foster the invention of methods, instruments and materials that will open new avenues of research in science.

2022 BYI National Recognition:

Nobel Prize in Chemistry: Carolyn Bertozzi

Alfred P. Sloan Award:

Alison Wendlandt, Nicolas Pégard,

Jennifer Bridwell-Rabb

NIH New Innovator:

Hadi Nia

2022 BYI Program Stats:

250+ Applicants

10 Researchers Selected for Awards
Representing **9** Institutions

\$6 Million in Funding for '18-'22 Awardees

2022 Beckman Young Investigator Awardees

Milan Delor, PhD
Columbia University

Dylan Domaille, PhD
Colorado School of Mines



Pallav Kosuri, PhD
Salk Institute for Biological Studies
"Revealing the mechanome of the heart"

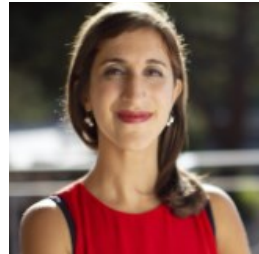
Mark Mimee, PhD
University of Chicago



Tania Morimoto, PhD
University of California, San Diego
"Next Generation Endoscopes: Soft, Growing Robots with Reconfigurable Joints and Variable Stiffness"

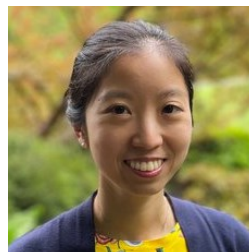
Anthony Mustoe, PhD
*2015 AOB Postdoctoral Fellow
Baylor College of Medicine

Hadi Nia, PhD
Boston University



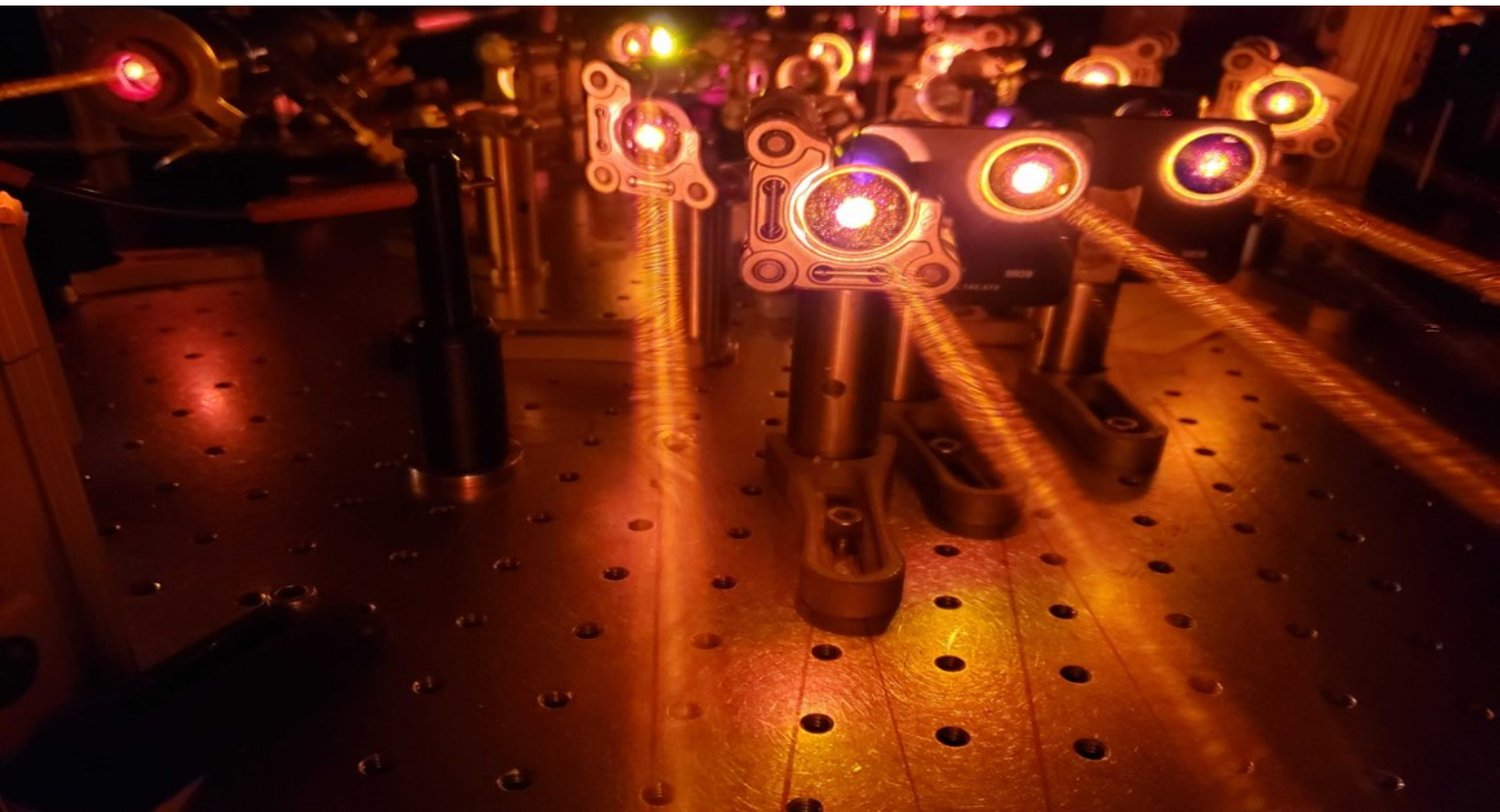
Lisa Poulidakos, PhD
University of California, San Diego
"Colorimetric Metasurfaces for Next-Generation, On-Chip Imaging of Tissue Microstructure"

Marcel Schreier, PhD
University of Wisconsin, Madison



Dianne Xiao, PhD
University of Washington *2017 AOB
Postdoctoral Fellow
"Elucidating Structure-Activity Relationships in Defect-Rich Cu Electrocatalysts for Renewable Fuel Production"





Above: AOB Postdoctoral Fellow James Gaynor's research in the Attosecond Atomic and Molecular Dynamics Laboratory at UC Berkeley uses a neon-filled hollow-core fiber compressor (pictured) to generate laser pulses covering 500-1000 nm with sub-5 femtosecond pulse durations. Image credit: Dr. James D. Gaynor and Dr. Ashley P. Fidler

III. Arnold O. Beckman Postdoctoral Fellows

The Arnold O. Beckman Postdoctoral Fellows Award Program supports first and second year postdoctoral fellows at research institutions who are judged to have the highest potential for success in a career in chemistry, and who will become the next generation of leaders and innovators in science, engineering, and technology.

The program awards \$180,000 over two years for salary, fringe benefits, and research expenditures; instrumentation fellowships will receive additional one-time \$200,000 for material/development costs.

2022 Postdoc Program Stats:

70 Applicants

14 Researchers Selected for Awards

9 Institutions Represented

**\$1.5 Million in Funding
for '20 -'22 Awardees**

POSTDOC

2022 Arnold O. Beckman Postdoctoral Fellows

Alexandria Bredar, PhD
University of North Carolina, Chapel Hill

Andrew Zahrt, PhD
Massachusetts Institute of Technology



Caitlin Randolph, PhD
Purdue University

“Microfluidics Assisted Mass Spectrometry based Artificially Intelligent Platform for Single Cell Lipidomics”

Conner Harper, PhD
University of California, Berkeley

Jacob Spies, PhD
University of California, Berkeley



Jaehyeok Jin, PhD
Columbia University

“Multiscale Phase-Field Modeling of Next-Generation Energy Storage Materials”

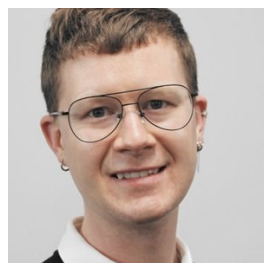
Jill Alty, PhD
Massachusetts Institute of Technology

Matthew Kessinger, PhD
University of North Carolina, Chapel Hill

Michael Burroughs, PhD
Stanford University

Rachel Bangle, PhD
Duke University

Samuel Dunning, PhD
Carnegie Institution for Science



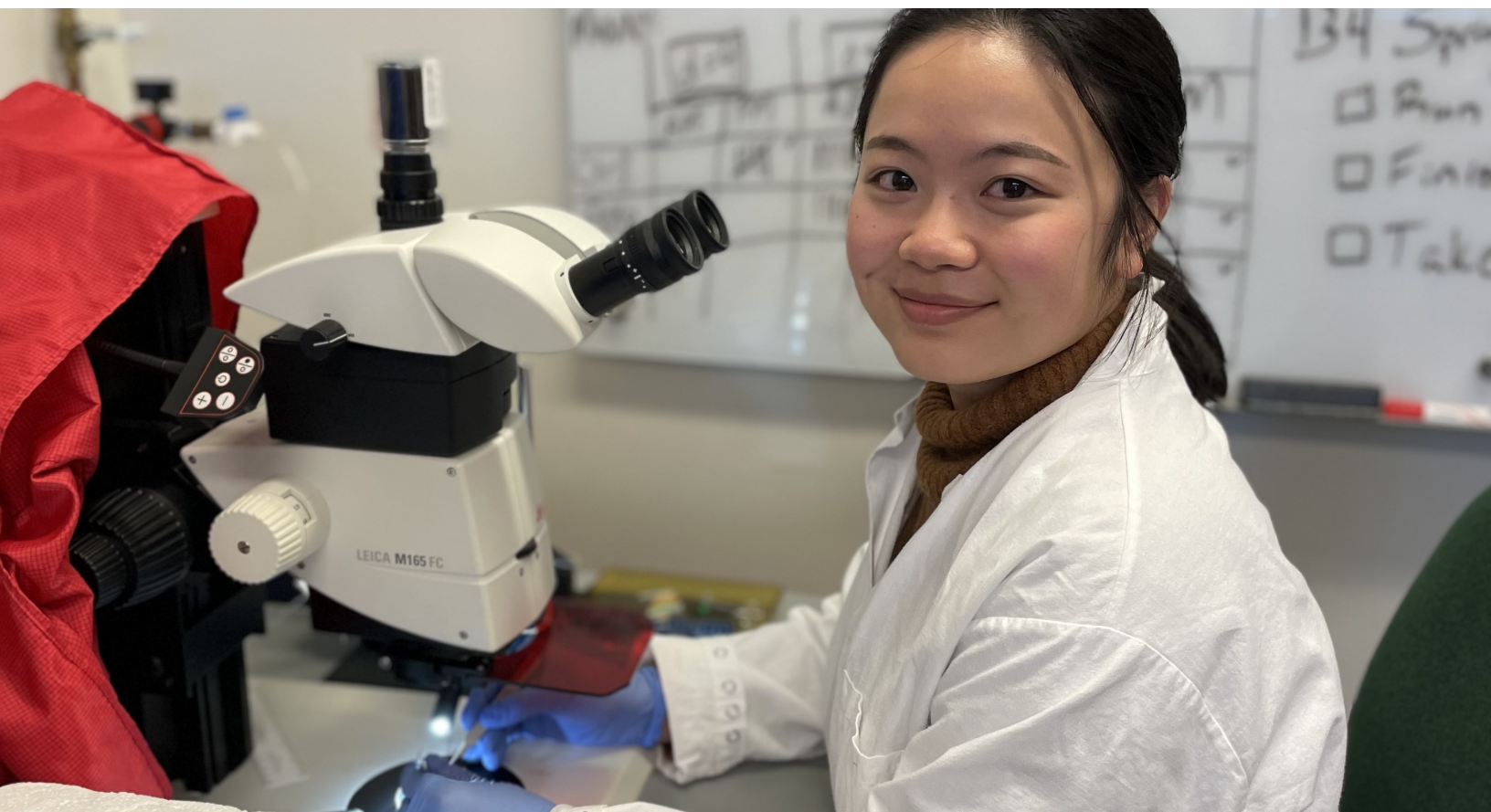
Samuel Thompson, PhD
Stanford University

“Expanding the synthetic potential in protein engineering with proteins that fold and function in water-immiscible solvents”

Tracy Schloemer, PhD
Stanford University

Wesley Chang, PhD
California Institute of Technology





*Above: 2021 Beckman Scholar Anthea Bell looks at characterization of the spaetzle protein in the Mediterranean field cricket *Gryllus bimaculatus* and its function in central nervous system plasticity for her research project at Bowdoin College in the lab of Professor Hadley Horch. Photo Credit: Tabarak Al Musawi*

IV. Beckman Scholars Program

The Beckman Scholars Program provides an in-depth, sustained research experience for exceptional undergraduate students in chemistry, biological sciences, or interdisciplinary combinations thereof. The program's award of \$26,000 for a student and mentor team over 15 continuous months of research, in conjunction with the Annual Beckman Symposium, offers an academically stimulating and unique educational experience.

The award spans three years and six student/mentor pairs are named per institution; applications by invitation only.

BSP National Recognition in 2022:

2022 Goldwater Scholars: Harry Dang, Arabella Hunter, Christina McBride, Sarah Noga

2022 NSF GRFPs Recipients: Anton Barybin, Ariel Gale, Jenny Lam, Kevin Pataroque, Nikita Sivakumar, Saman Tabatabaee, Lucy Yang

2022 BSP Program Stats:

14 Institutions Selected for 2022 Awards

72 Scholar/Mentor Teams began their Research Projects

\$1.8+ Million in Funding for '20-'22 Awardees

BSP

2022 Beckman Scholars

Isaac Ali

North Carolina State University

Karina Amador

Trinity College



Maxwell Austin

University of Utah

"Antimicrobial peptide stabilization and natural product scaffold mimicry using triazolinedione-based cyclization methods"

Abdullah Bajwah

University of Maryland, Baltimore County

Katharine Barrett

Bowdoin College

Conor Bready

Furman University

Camille Bridgewater

Virginia Polytechnic Institute

Lucy Brownstein

Smith College

Colin Burdette

Furman University



Camryn Carter

University of Richmond

"Small molecule interference with the hACE2 and SARS-COV-2 RBD complex junction"

Daniela Castellanos

Macalester College

Tanya Castellanos

California State University, San Marcos

Anthony Chavez

University of Southern California

Sera Choi

Virginia Polytechnic Institute

Janie DeGroot

Hope College

2022 Awardee Institutions

Barnard College

Binghamton University

Indiana University (IUPUI)

Macalester College

Ohio State University

Trinity College

Trinity University

University of Arizona

University of California, Los Angeles

University of California, Santa Barbara

University of Kentucky

University of Maryland, Baltimore County

Vanderbilt University

Vassar College

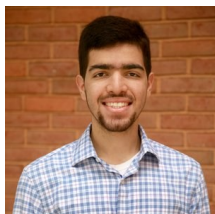


BSP

2022 Beckman Scholars—continued

Vilhelmina Done
University of Utah

Payton Downey
Carnegie Mellon University



Yassin Elalamy
University of Maryland, Baltimore County
“Determining the function of a small membrane protein involved in pathogenic iron acquisition”

Anabelle Elikan
Barnard College

Zachary Ellis
West Virginia University

Lake Ernst
Miami University

Dariana Serrano Fraticelli
Vassar College

Oscar Garrett
Haverford College



Elaf Ghoneim
University of Kentucky
“Defining the mechanisms of action of novel anti-inflammatory small molecule drug candidates currently in clinical trials”

Noah Gilbertson
Trinity University

Nicholas Gladkov
University of California, Los Angeles

Nick Godzik
University of California, Santa Barbara



Tierani Green
Barnard College
“Purification and characterization of the metalloenzyme UndB”

Jocelyn Gunn
University of Colorado, Boulder

Stefan Hansel
Tufts University

Skylar Harrelson
North Carolina State University

Aspen Hawkins
Trinity College

Haley Heine
Macalester College



BSP

2022 Beckman Scholars—continued



Hana Hieshima

Smith College

“Structural biochemistry of molecular motor cooperation in cellular cargo transport”

Bryan Ho

West Virginia University

Sarah Hourihan

Vanderbilt University

Brian K. Hu

Carnegie Mellon University



Samuel Idah-Oze

Texas A&M University

“Wearable point of care medical devices”

Benjamin Janda

Chapman University

Linnea Johnson

Indiana University (IUPUI)

Keya Jonnalagadda

University of California, Los Angeles

Jade Kang

Georgia State University

Amber Keith

Virginia Polytechnic Institute



Louie Kulber

Pomona College

“Exploring a pathway for the unconventional secretion of signal peptide proteins in C. elegans”

Justin Kwon

University of California, Irvine

Eva Lorenz

Trinity University

Nicholas Mortimore

University of Arizona

Angelyn Nguyen

University of Southern California

Sufana Noorwez

Vassar College

Steven Oakes

University of Colorado, Boulder

Chinedu Odedo

Georgia State University

Talia O’Shea

Wellesley College



BSP

2022 Beckman Scholars—continued

Clay Page

James Madison University

Arjun Pamidi

University of California, Irvine

Antony Peng

Vanderbilt University

Daniela Pierro

Pomona College

Quinton Reed

College of William and Mary

Travis Richard

Texas A&M University

Nicholas Richardson

Indiana University (IUPUI)

Mackenzie Riley

Carnegie Mellon University



Clara Rodriguez

Binghamton University

"Skin topography analysis over time for forensic application"

Emily Scheib

Ohio State University

Ishaan Shah

Chapman University

Liam Shanahan

Ohio State University



Leah Slepoi

Tufts University

"Identification of nucleases that cleave sites of DNA damage resulting from transcription-replication conflicts"

Parker Smith

University of California, Irvine

Parker Sornberger

University of Kentucky

Alana Thomas

College of William and Mary

Mihir Upadhye

University of California, Santa Barbara

Shruti Venkatesh

Binghamton University

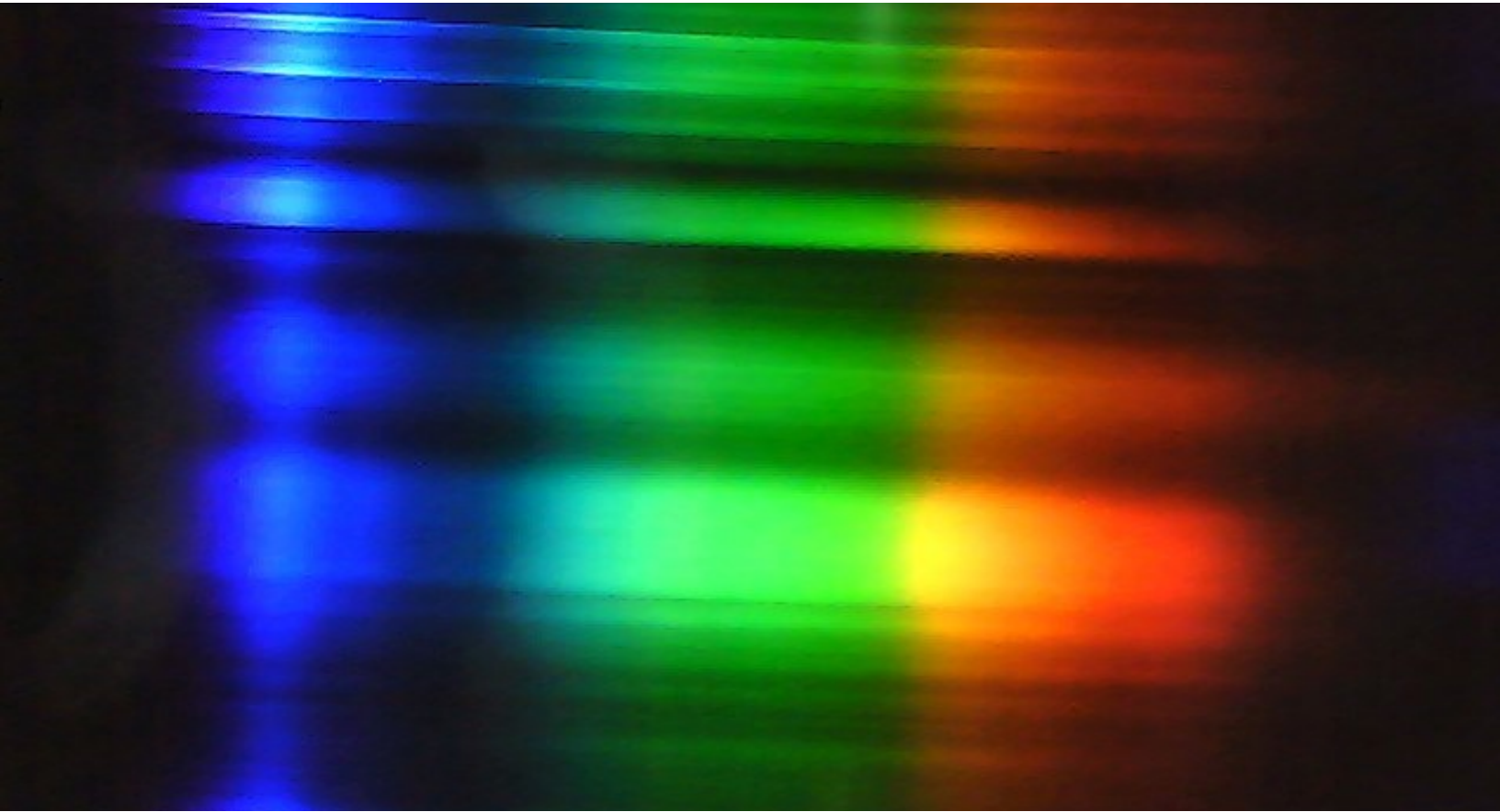
Bryce Wilson

University of Arizona

Helen Xia

University of Richmond





Above: Color-band light spectrum of black tea captured with a bent diffraction grating. Image credit: Elizabeth Koppe

VI. OC Beckman Legacy

The Arnold and Mabel Beckman Foundation is proud to announce the completion of the second year of the Orange County Beckman Legacy Award.

High school seniors worked with a science teacher mentor at their school to complete a spectrophotometer build, inspired by the revolutionary tools of Dr. Arnold O. Beckman, conduct lab work, create their own unique experiment, and answer reflection questions. Submitted projects were evaluated by the Foundation using a panel of outside experts.

2022 Program Highlights:

- The 2022 program was completed as a hybrid program at school and by distance learning.
- Applications for review were blinded.
- Awardees received from \$8,000 to \$16,000 college scholarships.

2022 Legacy Program Stats:

41 Applicants

6 Students Selected for Awards

5 High Schools Represented

\$72,000 in Funding for '22 Awardees

LEGACY

2022 Orange County Beckman Legacy Awardees



Lara Karas, First Place

Woodbridge High School, currently attending University of California, Los Angeles

"Effect of oxidation on the degradation of anthocyanin pigment"



Shaurya Raswan, First Place

Northwood High School, currently attending University of California, San Diego

"Effect of urban fertilizer runoff on harmful algae bloom in Orange County's water"



Charlene Hui, Second Place

Woodbridge High School, currently attending Vanderbilt University

"Effects of roasting time on concentration of melanoidins in coffee"



Gabriel Samcam-Vargas, Second Place

Tustin High School, currently attending Princeton University

"Concentration of L-ascorbic acid (vitamin C) between organic vs. inorganic produce using UV-Spectrophotometry"



Ethan Lai, Third Place

University High School, currently attending University of California, Los Angeles

"Effects of carrot color on beta-carotene concentration"



Pranav Mehta, Third Place

Northwood High School, currently attending University of California, San Diego

"Comparing anthocyanin concentration between organic and nonorganic red onions"



Above: MIND Research Institute's ST Math curriculum engages students in play to learn math. The PreK-8 visual instructional program leverages the brain's innate spatial-temporal reasoning ability to solve mathematical problems. Image: MIND Research Institute

VII. Local Community Support

The Foundation is proud to support innovative STEM and STEAM activities in the local community we call home, including:

Beckman Arts & Science Family Day
Festival-style science entertainment at Segerstrom Center for the Arts

Chapman University Foundation
Support for the Keck Center for Science and Technology

Discovery Cube, Orange County
Children's museum focused on STEM and hands-on learning

Irvine Public Schools Foundation
CubeSat high school program launching satellites into space

Kids@Science
Local Orange County STEM teacher training initiative and science kits

MIND Research Institute
Curriculum development for ST Math Core

OC Science and Engineering Fair
Special awards and support

Sycamore Magnet Academy PTA
Fifth grade outdoor science education



Left column (top down): Kids@Science supports local Orange County teachers by providing them with professional development in STEM, opportunities to network with science advocates, and hands-on science kits with supplies for their classrooms. Of the teachers that attended the workshops, 95 percent gave a 4 or 5 star rating and indicated they developed more confidence and greater understanding for teaching science curriculum. In these images, students engage in hands-on STEM activities led by teachers putting recent workshop training into practice. Images: Kids@Science.

Right column (top down): Fifth-grade students at Sycamore magnet Academy in Tustin participated in a 3-day stayover outdoor science camp in the San Bernardino Mountains, exploring nature and learning about geology, wildlife biology, forest ecology, and astronomy. For many, it was their first time away from home and an experience that allowed independence and autonomy resulting in greater confidence and pride. Images: Sycamore Magnet Academy PTA





*Above: Attendees at the Beckman Regional Symposium at California Institute of Technology
Below (left): Attendees at the Beckman Regional Symposium at Rutgers University (right)*



VIII. Annual Beckman Symposium

The annual Beckman Symposium brings together the nearly 300 grantees from our programs and Foundation leadership, including members of the Board of Directors, Scientific Advisory Council, Executive Committees, and Beckman Institutes.

The 2022 one day in-person event at multiple locations featured researchers from varied backgrounds, career stages, disciplines and institutions sharing their latest research findings in the form of oral and poster presentations and a networking lunch.

After the scientific sessions conclude, the participants typically relaxed with colleagues and viewed the scientific posters.

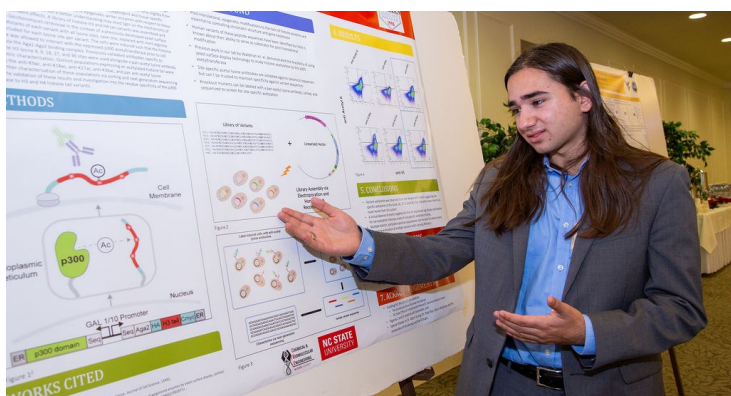
2022 Beckman Symposium was held at 7 regional locations:

California Institute of Technology
Georgia Institute of Technology
Massachusetts Institute of Technology
Rutgers University
University of California, Berkeley
University of Illinois, Urbana-Champaign
University of Richmond

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Above: Technical talk presenter at the Beckman Symposium at MIT



Above: Poster presenter at the Beckman Symposium at the University of Richmond (L) and UIUC (R)



Above: Group photo at the Beckman Symposium at Georgia Tech (L) and poster presenter at Caltech (R)

INSTRUMENTS



Above: Mountain view in Boulder, CO. Image courtesy of Devyn Narkchareon.

V. Instrumentation Grants

Investing in innovative instrumentation carries forward Dr. Beckman's legacy in developing research instruments and underscores the Foundation's mission of supporting research breakthroughs in chemistry and the life sciences.

In 2016, the Foundation funded five grants of \$2.5M each for purchase costs of new Cryo-EM instrumentation, support for a junior faculty hire in structural biology, and operational expenses.

In 2019, the Foundation launched the Advanced Light-Sheet Microscopy and Data Science program to provide support of \$1.2 million to eight research groups for the acquisition of instrumentation, cost of proposed research programs, and establishing robust teams for data science collaboration.

In January 2021, the Foundation selected seven recipients of the Focused Ion Beam (FIB) Milling for Cryo-Electron Tomography (Cryo-ET) program with grants of \$1.5 million. This breakthrough technology enables high-resolution 3-D imaging in cellular interiors to determine the structures of organelles and proteins in their natural environments.

The latest Foundation instrumentation initiative was announced in 2022 for proposals to advance Mass Spectrometry for Atmospheric Monitoring. This program is inspired by the groundbreaking work that Dr. Beckman oversaw with the LA Chamber of Commerce in the 1950s to understand the chemical composition of smog. Awardees will receive \$1 million grants and awards will be announced in 2023.



Above: Groundbreaking ceremony for the Beckman Institute at University of Illinois, Urbana-Champaign.

IX. Beckman Institutes and Centers

In 1978, Dr. and Mrs. Beckman began their philanthropic giving by founding five basic science research institutes and centers at leading universities that had been influential in their own lives. Each of the research Institutes and Centers have a mission to promote novel interdisciplinary science programs, and provide access to leading instrumentation facilities. In addition to the research Institutes, Dr. and Mrs. Beckman also established the Beckman Center of the National Academies as the west coast headquarters for National Academy activities and scientific conferences.

The Beckman Foundation continues the commitment to these Institutes and Centers through an annual Director's Fund grant, which may be used at the sole discretion of the Directors.



**Dr. Nadya Mason, Director
Beckman Institute at University of
Illinois, Urbana-Champaign**



Beckman Research Institute at Caltech

*Director: Dr. Marianne Bronner
Pasadena, CA*



Beckman Institute for Advanced Science and Technology at the University of Illinois, Urbana-Champaign

*Director: Dr. Nadya Mason
Urbana, IL*



Beckman Research Institute at City of Hope

*Director: Dr. Steven Rosen
Duarte, CA*



Beckman Laser Institute & Medical Clinic at University of California, Irvine

*Director: Dr. Tom Milner
Irvine, CA*



Beckman Center for Molecular & Genetic Medicine at Stanford University

*Director: Dr. Lucy Shapiro
Stanford, CA*



Above: 2022 Beckman Symposium at Rutgers University Presentation by 2021 BYI Tania Lupoli

X. Beckman Speaker & Conference Support

The Arnold and Mabel Beckman Foundation Speaker and Conference Support Program is open to all current Foundation grant awardees, specifically from the BSP, AOB Postdoc, BYI, or Beckman-Argyros Vision Research programs. Current Beckman awardees organizing or hosting a seminar or conference at their institution can invite a member of the Beckman Family to be a speaker and submit an application to this program for funding up to \$3,000 per request, in support of, but not limited to: Speaker travel, room rental fees, reception costs, food, beverages, printed materials, etc.

The Foundation chooses a limited number of Speaker and Conference events based on their relevance to the mission of the program and Foundation as a whole, campus, scientific and community impact, and the scope of appeal of the event.

In 2022, Speaker and Conference support was provided to:

Jia Niu, PhD

Boston College

Jill Alty, PhD

Massachusetts Institute of Technology

Nicolas Pégard, PhD

Sculpted Light in the Brain Association



Above: 2016 BYI Jing-Ke Weng investigates harnessing the light production pathway of fireflies for other imaging and power applications.

XI. Financial Report

The Foundation's endowment net assets decreased by \$104 million in 2022 from the unrealized losses in investments, consistent with overall market trends. During the past year, the Foundation reviewed its investment results relative to peers, updated its policy statement to include 3- and 7-year performance objectives, and reduced the number of portfolio asset class allocation categories for more focused reporting. Also, the Foundation used a prior year IRS set aside to partially fund \$9.1 million in equipment purchases and related staffing to add focused ion beam milling capabilities to cryogenic electron microscope facilities at major research center across the U.S.

Lastly, the Foundation fully implemented FinancialForce as the accounting system of record to complement its use of Salesforce for programs administration.

Fiscal Year Financial Highlights: (Sept. '21-Aug. '22)

Total expenses and grant disbursements:

\$31,439,000

After our expenses, unrealized investment loss, and accrual adjustments, the decrease in net assets was \$103,637,000.