

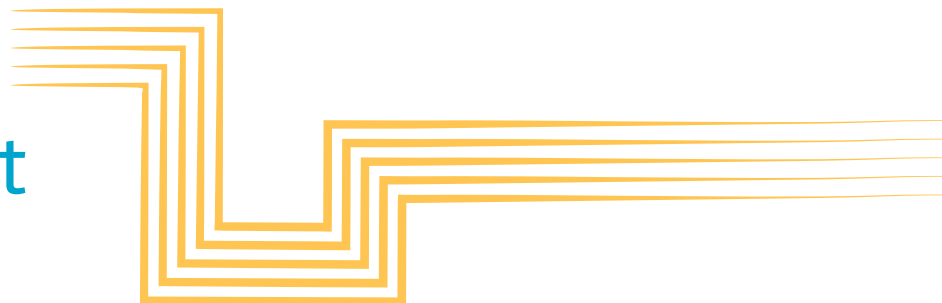


RESEARCH CORPORATION  
*for* SCIENCE ADVANCEMENT

# Charting a New Path

2025 Annual Report

# Letter from the President



This has been a year of remarkable activity for Research Corporation for Science Advancement, alongside disruptive challenges for the scientific enterprise. As teaching and research continue to evolve rapidly – shaped by advances in artificial intelligence, shifting federal priorities, and the growing need for collaboration across disciplines and institutions – RCSA remains committed to ensuring we are positioned to advance the U.S. scientific enterprise effectively in the years ahead.

Since joining RCSA last July, I have been deeply grateful for the warm welcome I have received from our scholars, fellows, facilitators, foundation partners, and colleagues across the scientific community. Your dedication to discovery, education, and the advancement of science is the foundation of RCSA's work. I also extend my sincere appreciation to the entire RCSA staff, whose professionalism, creativity, and commitment drive everything we do in support of teacher-scholars and the broader research enterprise.

In 2025, RCSA convened five Scialog meetings that brought together outstanding early-career scientists to pursue bold, collaborative ideas. From *Neurobiology and Changing Ecosystems* and *Automating Chemical Laboratories* in the spring, to *Sustainable*

*Minerals, Metals, and Materials*, *Early Science with the LSST*, and *Quantum Matter and Information* in the fall, these meetings supported innovative approaches to some of today's most compelling scientific questions.

The Cottrell Scholars Conference in July showcased the exceptional strength of our teacher-scholar community, with participation from 27 of the 31 classes since the program's founding in 1994. We look forward to welcoming our 24 new Cottrell Scholars, the Class of 2026, at our meeting this summer. We also remain steadfast in strengthening the science pipeline through the RCSA Fellows program, and we are pleased to welcome 13 new Fellows this year.

In September, we launched the RCSA Bridge Awards to support faculty with outstanding research programs experiencing disruptions due to sudden federal policy changes. The 11 awardees were announced in early 2026, and we are grateful to our Board of Directors for supporting this crucial and responsive program.

Science and science philanthropy are changing quickly, and the years ahead promise both great discoveries and significant tests for our community. RCSA is now well into the development of a new strategic plan, informed by broad community

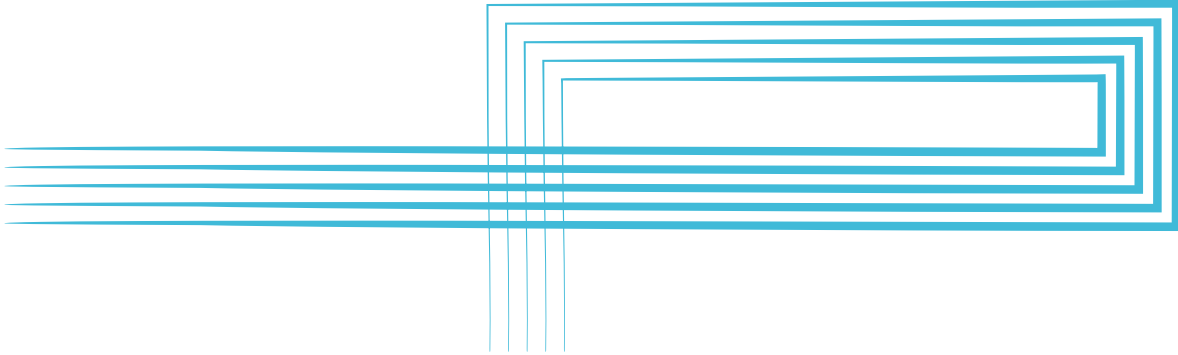
input and feedback from our awardees, higher-education leaders, and foundation partners. I want to thank the many members of our community who responded to our end-of-year survey – your insights and suggestions are invaluable as we chart an optimal path for continued impact. We will continue strengthening RCSA's leadership in early-career support and interdisciplinary collaboration by building on our cornerstone **Scialog** and **Cottrell Scholar** programs, as well as our **RCSA Fellows Initiative**, while adapting thoughtfully to emerging challenges and opportunities.

As we move forward, we remain focused on our core mission: supporting early-career scientists with bold ideas. In a challenging time for scientific research in the United States, your work – and our shared mission – matters more than ever.

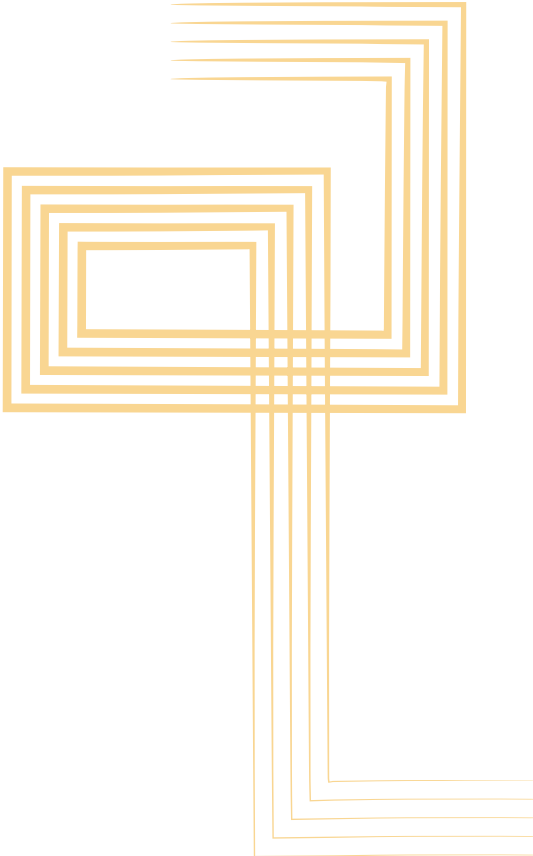


**Eric D. Isaacs**  
President & CEO  
Research Corporation  
for Science Advancement

# 2025 Programs & Awards



Research Corporation for Science Advancement supports early career researchers in the physical sciences and related fields at colleges and universities in the United States and Canada. RCSA has three ongoing core programs: the Cottrell Scholar Program, Scialog, and the RCSA Fellows Initiative. In 2025, it also launched an emergency initiative, RCSA Bridge Awards, to help stabilize strong research programs that experienced disruptions due to abrupt changes to their federal funding.



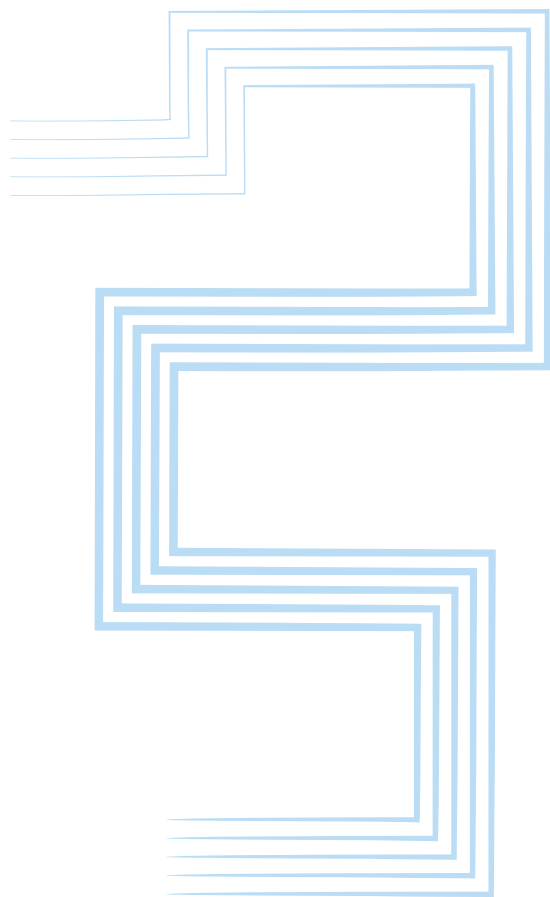
The **Cottrell Scholar Program** develops outstanding teacher-scholars recognized by their scientific communities for the quality of their research programs, innovation in education, and potential for academic leadership. In 2025, Cottrell Scholar Program funding included \$1,920,000 for 16 initial Cottrell Scholar Awards, \$100,000 for four Cottrell Scholars Collaborative Awards, and \$620,000 for Cottrell Plus Awards, which include the competitive SEED, STAR, and IMPACT awards. The third year of our Robert Holland Jr. Awards made awards totaling \$15,000 and welcomed three senior scholars to the Cottrell Scholar community. One Cottrell Scholar received \$5,000 to fund a regional meeting.

**RCSA Bridge Award** was a needs-based opportunity for Cottrell Scholars with high-potential programs that experienced significant and demonstrable disruptions due to changes in federal, state, or institutional funding. RCSA made awards of up to \$100,000 each to 11 teacher-scholars.

**Scialog** promotes dialogue and community-building to catalyze transformational science through collaborative, interdisciplinary research. In 2025, RCSA awarded \$1,834,884.97 to early career scientists for research through Scialog Collaborative Innovation Awards. Partner philanthropies – which in 2025 included the Paul G. Allen Frontiers Group, the Paul G. Allen Family Foundation, the Arnold and Mabel Beckman Foundation, The Brinson Foundation, the Frederick Gardner Cottrell Foundation, The Heising-Simons Foundation, The Kavli Foundation, the Leinweber Foundation, the Simons Foundation, the Alfred P. Sloan Foundation, and Kevin Wells – contributed a further \$4,286,000 toward Scialog awards.

The **RCSA Fellows Initiative** named 13 RCSA Fellows in the second year of this effort to help outstanding postdoctoral scholars with a variety of perspectives, experiences, and backgrounds to successfully transition to tenure-track faculty roles in the physical sciences.

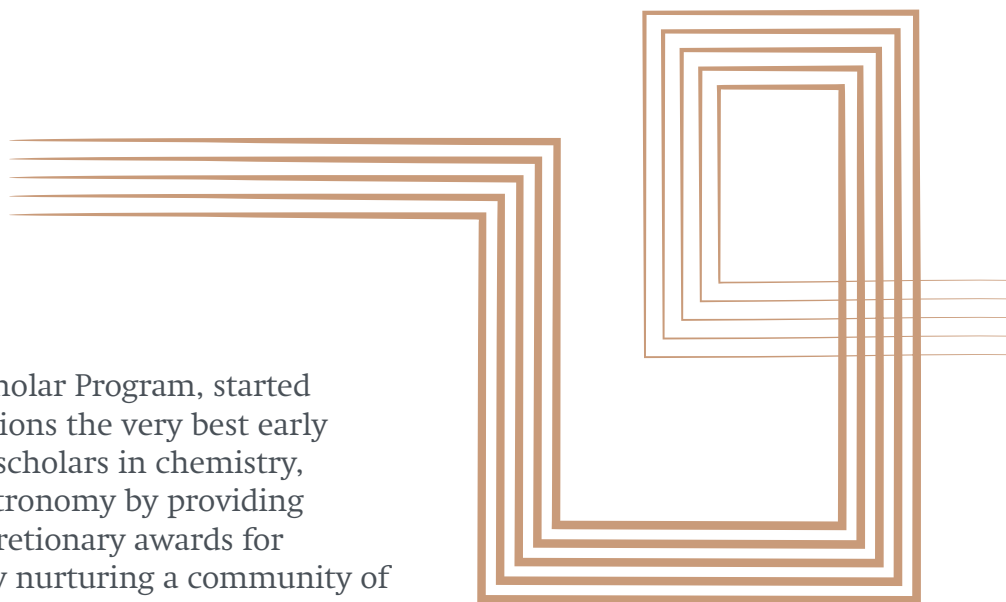
# Cottrell Scholar Program



The Cottrell Scholar Program, started in 1994, champions the very best early career teacher scholars in chemistry, physics, and astronomy by providing significant discretionary awards for research and by nurturing a community of outstanding leaders in science, education, and academia. Although the Cottrell Scholar Award is the entry point to this interdisciplinary community, the program also supports scholars throughout their academic careers with competitive Cottrell Plus awards.

Maintaining an active, multigenerational community of more than 600 academic scientists is a unique aspect of the Cottrell Scholar program. Cottrell Scholars engage in an annual networking event, providing them with opportunities to share insights and expertise through Cottrell Scholars Collaborative projects.

In 2025, the Cottrell Scholar community welcomed 16 new Cottrell Scholars and three Robert Holland Jr. Award winners.



**“Being a Cottrell Scholar has been the highlight of my professional career to date – what a special program and community.”**

**Cottrell Scholar 2021 Jeanine Amacher**

# Cottrell Scholar Awards

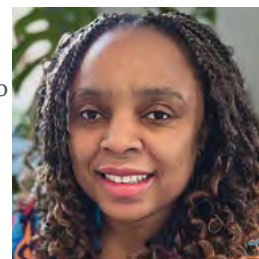
\$120,000 was awarded to each scholar for a total of \$1,920,000.



**Camille Avestruz**  
Physics,  
University of Michigan  
*Modeling Giants in our Universe:  
Galaxy Clusters as Probes  
of Cosmology*



**Tyler Engstrom**  
Physics,  
University of Northern Colorado  
*Prestress-Generated Odd Elasticity  
with Applications to Waveguides*



**Alvine Kamaha**  
Physics,  
University of California,  
Los Angeles  
*Improving Background  
Mitigation in Dark Matter  
Searches and Improving  
the Diversity of the Workforce  
in Dark Matter Searches*



**Lucas Busta**  
Chemistry,  
University of Minnesota Duluth  
*Using Artificial Intelligence to  
Predict Enzyme Products and  
Enhance Chemical Education*



**Aaron Harrison**  
Chemistry,  
Trinity University  
*Resolving Brown Carbon  
and Bioaerosol Fluorescence  
in Atmospheric Studies*



**Lawrence Lee**  
Physics,  
University of Tennessee,  
Knoxville  
*Developing Muon Collider  
Technologies: Building Tomorrow's  
Discovery Collider Today*



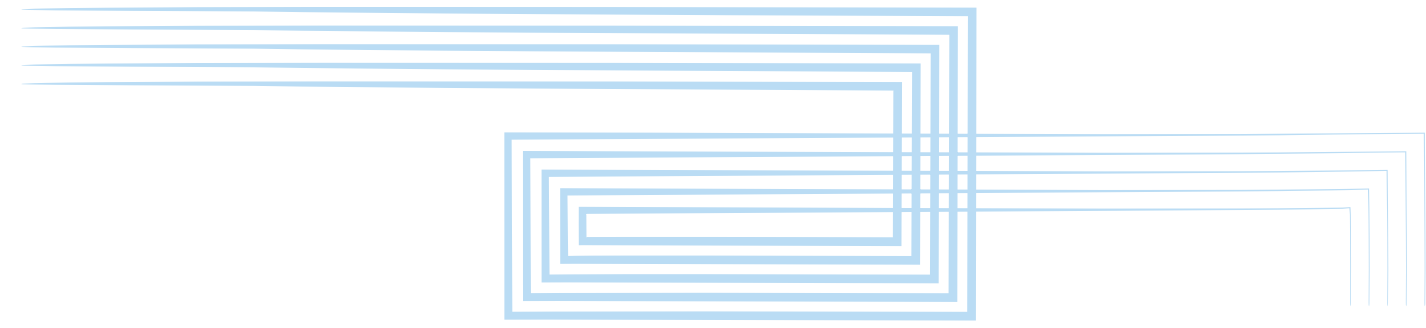
**Bassil El-Zaatari**  
Chemistry,  
Davidson College  
*Catalyzing Dynamic Exchanges  
in Polymers and the Classroom*



**Nick Jackson**  
Chemistry,  
University of Illinois  
at Urbana-Champaign  
*Electronic Dynamics Using  
Coarse-Grained Molecular  
Representations*



**Chris Li**  
Chemistry,  
University at Buffalo SUNY  
*Development of a Plasma  
Electrochemical System  
for Air-to-Ammonia Conversion*



**Adam Miller**  
Astronomy,  
Northwestern University  
*Simultaneously Early and Late:  
Leveraging LS4 and LSST  
to Understand the Physics  
of White Dwarf Supernovae*



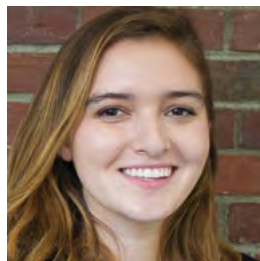
**Sabrina Stierwalt**  
Astronomy,  
Occidental College  
*Fostering Community  
in Undergraduate Physics Students  
through Community Based  
Learning and Innovative Research*



**Marissa Weichman**  
Chemistry,  
Princeton University  
*Quantum State Resolution  
of Aromatic Molecules for  
Laboratory Astrochemistry*



**Ryan Poling-Skutvik**  
Physics,  
University of Rhode Island  
*Developing a Dynamic  
Taxonomy of Soft Matter for a  
New Era of Material Design*



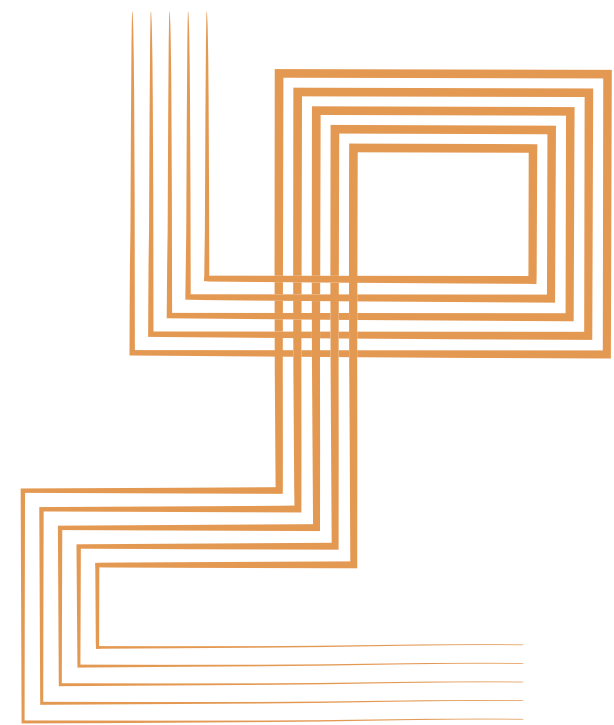
**V. Ashley Villar**  
Astronomy,  
Harvard University  
*Closing the Gap: Linking  
Luminous Red Novae to Binary  
Stellar Evolution*



**Liliana Rivera Sandoval**  
Astronomy,  
University of Texas  
Rio Grande Valley  
*Investigating the Effects of Stellar  
Interactions in Globular Clusters  
through their Compact Binary  
Population*



**Allison Walker**  
Chemistry,  
Vanderbilt University  
*Discovery of Enzyme Catalyzed  
Chemical Reactions Guided by  
Artificial Intelligence*



# Cottrell Scholars Collaborative Awards



At the annual Cottrell Scholar Conference, participants are encouraged to form teams and develop collaborative projects with potential national impact in science education. Through the Cottrell Scholars Collaborative program, RCSA gave awards of \$25,000 each to four projects in 2025.

## **A Cottrell Scholars Workshop: Teaching Critical Thinking (for STEM) in an AI World**

In a world of widespread misinformation and the rapid introduction of AI into academia, students need better skills to discern the accurate from the inaccurate, and the well-reasoned from the biased. Teacher-scholars also need guidelines aligning with sound scientific principles on instructing their students in critical thinking, interpretation and evaluation, and how to responsibly incorporate AI into all stages of their research, from project design to evaluation to the writing of papers. This workshop will bring together Cottrell Scholars and experts from other fields, such as the philosophy of science, to produce actionable strategies for academics, administrators, and students that the collaborative aims to share in popular media or scholarly literature.

*Lead Cottrell Scholar:*

**Claire Till**

Chemistry, California State Polytechnic University, Humboldt

*In collaboration with additional Cottrell Scholars:*

**Lucas Busta**

Chemistry, University of Minnesota Duluth

**Joel Destino**

Chemistry, Creighton University

**Christopher Durr**

Chemistry, Amherst College

**Adam Leibovich**

Physics, University of Pittsburgh

**Zachary Schulz**

Chemistry, Ohio State University

**Scott Shaw**

Chemistry, University of Iowa

**Chad Risko**

Chemistry, University of Kentucky

**Christopher Whidbey**

Chemistry, Seattle University

## **Re-imagining Community, Relationality, and Belonging for RCSA Scholars**

Research suggests that faculty from underrepresented backgrounds are less likely to receive mentorship, a key factor in obtaining tenure and promotion, developing a sense of support and belonging, and staying at their institutions. This project will establish a pilot peer network within the Cottrell Scholar community, bringing together scientists from diverse backgrounds, institutions, disciplines, and modes of scientific expertise (as well as external leaders) to meet monthly in a virtual format, and in-person at an annual meeting. A key component of the network will be development of the Distinguished RCSA Lecture Series, where network members will promote the scientific contributions of other scholars, especially those early in their careers, by inviting them to speak at their home institutions.

*Lead Cottrell Scholar:*

**Enrico Ramirez-Ruiz**

Astronomy, University of California, Santa Cruz

*In collaboration with additional Cottrell Scholars:*

**Carlos Argüelles Delgado**

Physics, Harvard University

**Camille Avestruz**

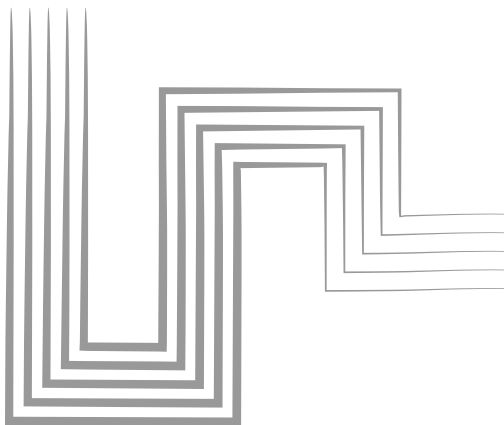
Physics, University of Michigan

**Raychelle Burks**

Chemistry, American University

**Luis Colón**

Chemistry, University at Buffalo





**Javier Duarte**

Physics, University of California, San Diego

**Kevin Hewitt**

Physics, Dalhousie University

**Alvine Kamaha**

Physics, University of California, Los Angeles

**Angel Martí**

Chemistry, Rice University

**Charles McCrory**

Chemistry, University of Michigan

**Jorge Muñoz**

Physics, University of Texas at El Paso

**Rosario Porras-Aguilar**

Physics, University of North Carolina at Charlotte

**Liliana Rivera Sandoval**

Astronomy, University of Texas Rio Grande Valley

**Ashley Villar**

Astronomy, Harvard University

**Luisa Whittaker-Brooks**

Chemistry, University of Utah



**Introductory STEM the Cottrell Way**

Selecting a major and even a career can be challenging for many college students, especially those who are first-generation or come from under-resourced high schools. This collaborative proposes to identify proposed changes to introductory chemistry and physics sequences that will help students make more informed choices about their major and future career options and minimize attrition in STEM majors. The project will consist of a one-day meeting to share current innovations and develop a set of proposals departments could pilot, followed by pilots of those ideas at selected departments. Outcomes of the pilots will be assessed and disseminated in venues such as conference presentations and journal articles.

*Lead Cottrell Scholar:*

**Michael Dennin**

Physics, University of California, Irvine

*In collaboration with additional Cottrell Scholars:*

**Katherine Aidala**

Physics, Mount Holyoke College

**Gordon Berman**

Physics, Emory University

**Penny Beuning**

Chemistry, Northeastern University

**Charlie Doret**

Physics, Williams College

**Jordan Gerton**

Physics, University of Utah

**Michael Hildreth**

Physics, University of Notre Dame

**Adam Leibovich**

Physics, University of Pittsburgh

**Zachary Schulz**

Chemistry, Ohio State University

**Michael Strauss**

Astronomy, Princeton University

**Rory Waterman,**

Chemistry, University of Vermont





# Cottrell Scholar Regional Meetings

## Connecting Science and People through Storytelling: A CS Writing Community to Develop, Preserve, and Broadcast Scientist Narrative

Human-centered storytelling can help build much-needed public trust and appreciation of science, science history, and scientists, but few scientists are trained in science communications, much less in writing about non-technical topics. This project aims to build a sustainable, supportive writing community for Cottrell Scholars to produce engaging, high-impact, public-facing science writing in a variety of formats, from short essays to creative nonfiction, op-eds, and oral histories. The program will include regular writing practice sessions, an in-person retreat, individualized coaching with professional publishing consultants, and the creation of an anthology of stories showcasing the voices and stories of Cottrell Scholars.

*Lead Cottrell Scholar:*

### **Aurora Pribram-Jones**

Chemistry, University of California, Merced

*In collaboration with additional Cottrell Scholars:*

### **Timothy Atherton**

Physics, Tufts University

### **Camille Avestruz**

Physics, University of Michigan

### **Tyler Engstrom**

Physics, University of Northern Colorado

### **Jennifer Heemstra**

Chemistry, Washington University in Saint Louis

### **Lydia Kisley**

Physics, Case Western Reserve University

### **Roman Kogler**

Physics, German Electron Synchrotron DESY

### **Kerstin Nordstrom**

Physics, Mount Holyoke College

### **William Pfalzgraff**

Chemistry, Chatham University

### **Shahir Rizk**

Chemistry, Indiana University South Bend

### **Rory Waterman**

Chemistry, University of Vermont

### **Christopher Whidbey**

Chemistry, Seattle University

RCSA makes funds available to Cottrell Scholars who wish to host one-day regional meetings at their institutions to discuss research, teaching, and career development. In 2024, RCSA awarded \$5,000 for one regional meeting.

### **Rae Robertson-Anderson**

Physics, University of San Diego

*Frontiers of Soft Matter and Macromolecular Networks*

# Cottrell Plus Awards

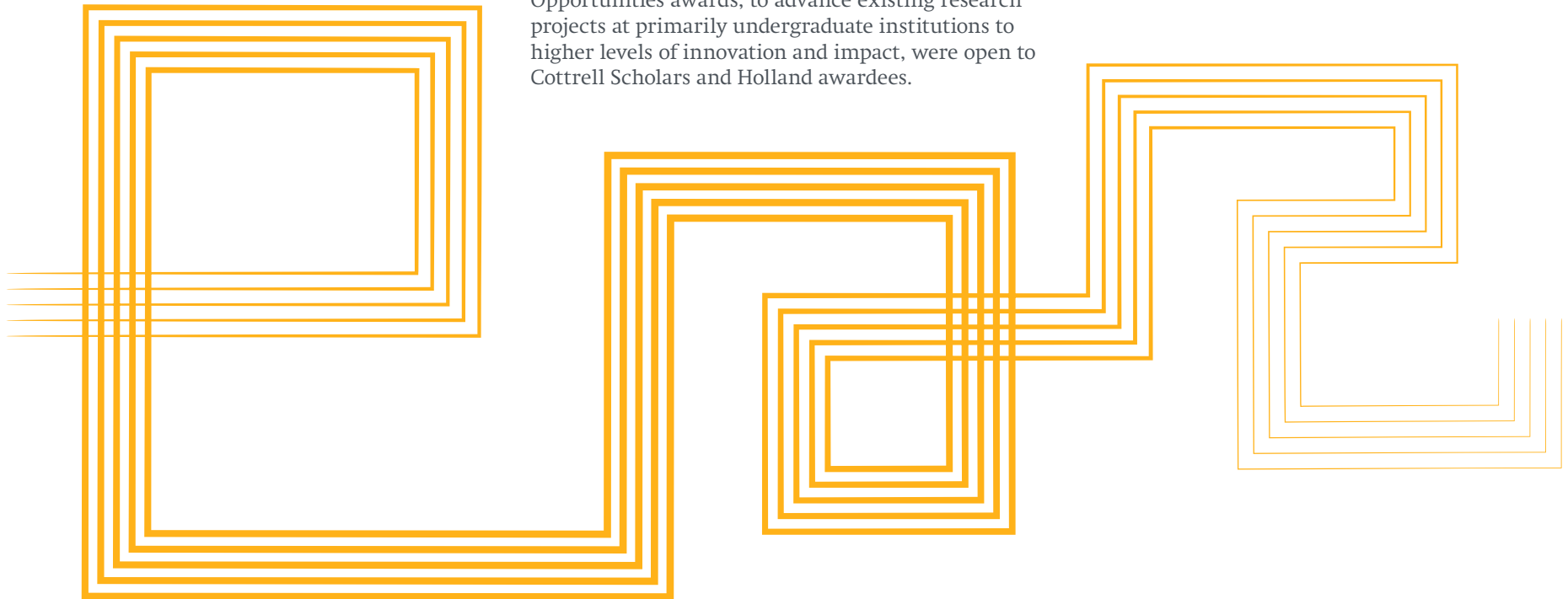


As their scientific careers advance, members of the Cottrell Scholar community are eligible to apply for post-tenure Cottrell Plus Awards to further support their research and educational activities. In 2025, SEED, STAR, and IMPACT awards were given.

**SEED** (*Singular Exceptional Endeavors of Discovery*) Awards are competitive grants of \$60,000 each to launch new projects. RCSA's expanded SEED Awards now include two categories: New Research Directions, and Exceptional Opportunities. New Research Directions awards, for innovative research projects with potential to lead to a transformative line of inquiry, were open to Cottrell Scholars and Holland Award recipients from research universities and primarily undergraduate institutions. Exceptional Opportunities awards, to advance existing research projects at primarily undergraduate institutions to higher levels of innovation and impact, were open to Cottrell Scholars and Holland awardees.

**STAR** (*Excellence in Science Teaching and Research*) Awards of \$5,000 recognize the outstanding research and educational accomplishments of Cottrell Scholars and encourage the improvement of science education at American and Canadian universities and colleges.

**IMPACT** Awards of \$5,000 recognize the work of Cottrell Scholars who have had a national impact in science through their leadership and service activities.



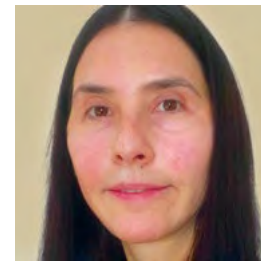
# SEED Awards for New Research Directions



Rafael Fernandes, **SEED**  
CS 2016  
University of Illinois  
at Urbana-Champaign  
*Unconventional Magnetism  
in Strongly Interacting  
Quantum Materials*



Stella Offner, **SEED**  
CS 2018  
University of Texas at Austin  
*Predicting Star Formation:  
Past and Future*



Lea Santos, **SEED**  
CS 2009  
University of Connecticut  
*Critical Quantum Sensing with  
Driven Superconducting Circuits*



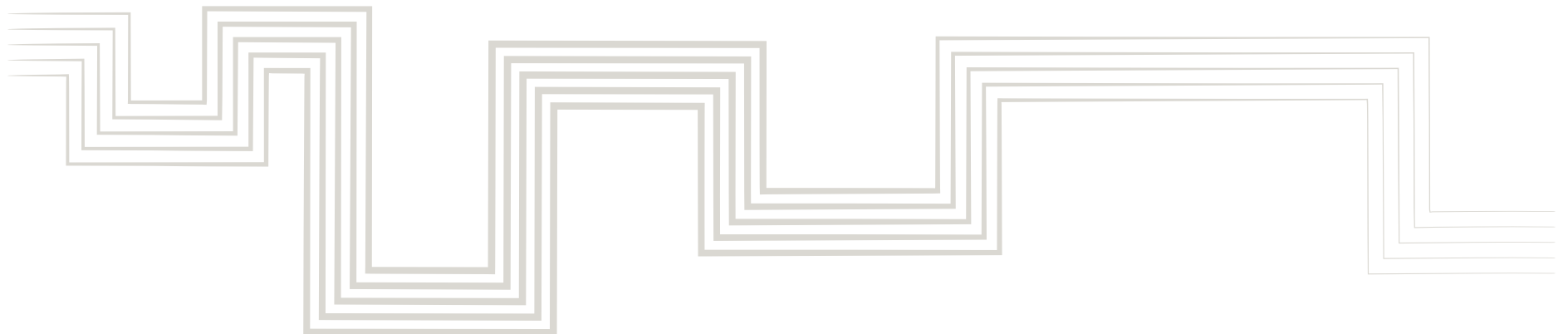
Mariangela Lisanti, **SEED**  
CS 2017  
Princeton University  
*Galaxy Formation Beyond Cold  
Dark Matter*



Eduardo Rozo, **SEED**  
CS 2018  
University of Arizona  
*Measuring  $H_0$  Using the Infall  
Profile of Galaxy Clusters*



Abigail Viereggs, **SEED**  
CS 2018  
University of Chicago  
*Probing the Cosmological Dark  
Ages: Site Characterization  
and Radio Receiver Development*



# SEED Awards for Exceptional Opportunities



Mario Affatigato, **SEED**  
CS 1996  
Coe College  
*Pushing to Boundaries of  
the World's Most Common  
Glassformer: A Fragile-to-Strong  
Transition of Silica Glass*



Meredith Hughes, **SEED**  
CS 2018  
Wesleyan University  
*Gas in Debris Disks as a Tracer  
of Stellar Astrophysics*



Charlie Doret, **SEED**  
CS 2017  
Williams College  
*Molecular Isotope Shift  
Spectroscopy in CaH+*



Rae Robertson-Anderson, **SEED**  
CS 2010  
University of San Diego  
*Harnessing Circadian Clocks  
to Control Active Matter*



# STAR and IMPACT Awards



Richard Brutchey, **STAR**  
CS 2010  
University of Southern California



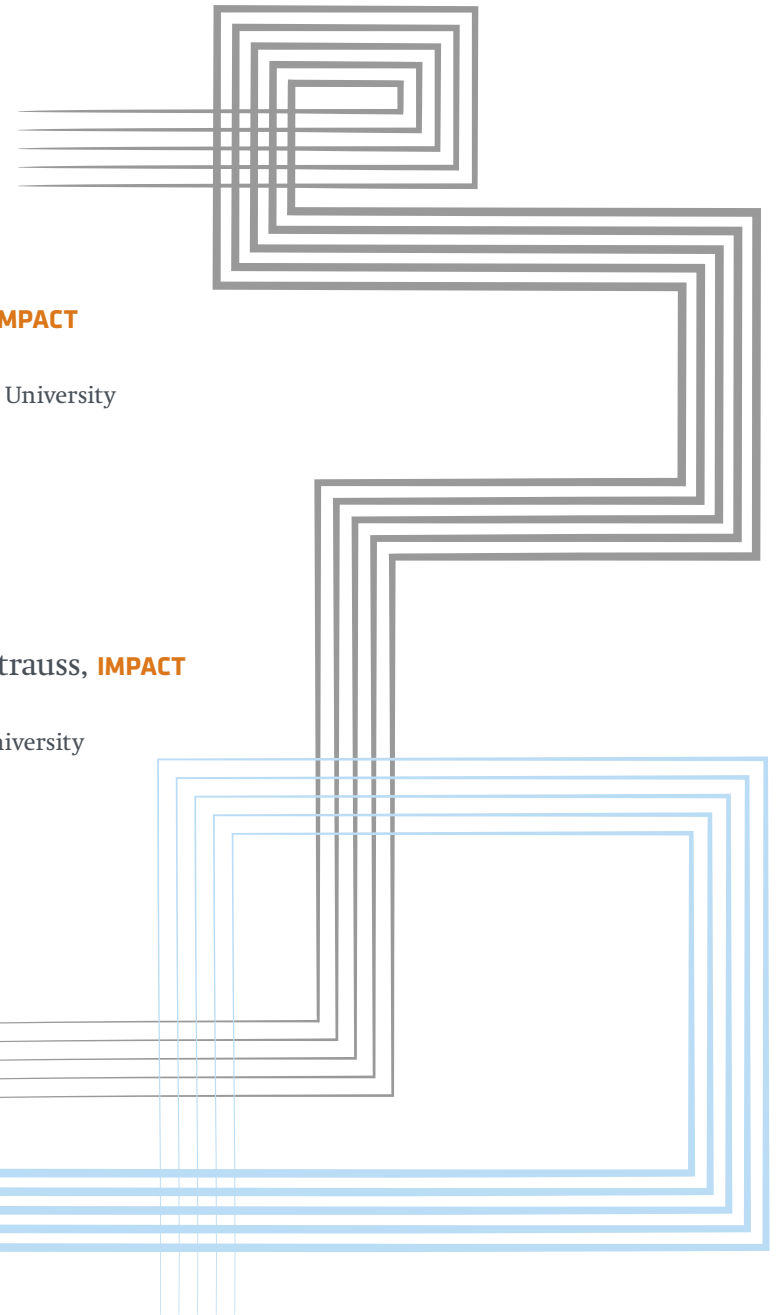
Eric Hegg, **IMPACT**  
CS 2002  
Michigan State University



Jenny Ross, **STAR**  
CS 2010  
Syracuse University



Michael Strauss, **IMPACT**  
CS 1997  
Princeton University



# Robert Holland Jr. Awards

Three senior scientists with impressive records of scholarship, leadership, and impact received **Robert Holland Jr. Awards** for research excellence, leadership, creativity, and mentoring in the physical sciences. The awards welcome recipients as full members of the Cottrell Scholar community who bring important new voices and ideas to the annual Cottrell Scholar Conference and Cottrell Scholars Collaborative teams. Holland awardees become eligible for all Cottrell Plus initiatives, including STAR, IMPACT, and SEED Awards.



Kevin Hewitt  
Physics,  
Dalhousie University



Enrico Ramirez-Ruiz  
Astronomy,  
University of California,  
Santa Cruz



Angel Martí  
Chemistry,  
Rice University

# RCSA Bridge Awards

RCSA launched this emergency initiative to help stabilize research programs after funding disruptions at the state and federal levels. The awards were open to scientists with appointments at U.S. academic institutions who either received a Cottrell Scholar Award in 2016 or later or are Holland Award recipients whose first academic appointment was in 2013 or later. Funds from the awards, focusing on high-potential programs that experienced significant and demonstrable funding disruptions, were intended to further advance recipients' research or educational efforts, for example by ensuring completion of dissertations or post-doctoral studies of trainees or by ensuring support of undergraduate research opportunities under the applicant's direction.

“I was not eligible to apply but love to see RCSA step up in this way. Many of us are seriously worried about our younger colleagues' futures in science.”

**Cottrell Scholar 2003 Nikki Pohl**

# 2025 RCSA Bridge Awards

Eleven members of the Cottrell Scholar community received awards totaling \$800,000.



Vinayak Agarwal  
CS 2021  
Georgia Institute of Technology  
*Eukaryotic Halogenation Biochemistry for Unlocking Global Halogen Geocycles*



Jutin Caram  
CS 2021  
University of California, Los Angeles  
*Single Nanocrystal Spectroscopy in the Shortwave Infrared*



Ronit Freeman  
CS 2023  
University of North Carolina at Chapel Hill  
*Engineering Living Materials for Long Term Therapeutic Release*



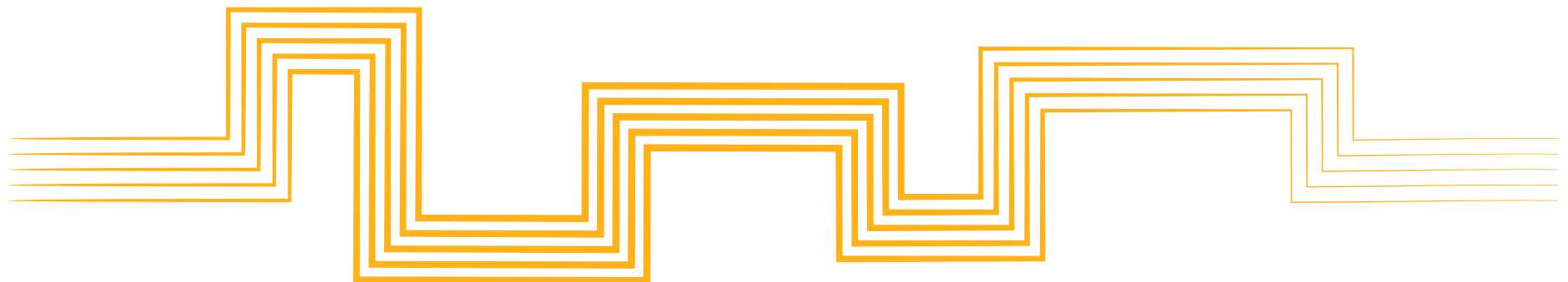
Carlos Argüelles Delgado  
CS 2024  
Harvard University  
*Probing the Nature of Mass with Neutrino Telescopes*



Eli Levenson-Falk  
CS 2021  
University of Southern California  
*Multi-mode Superconducting Circuits for Quantum Error Suppression*

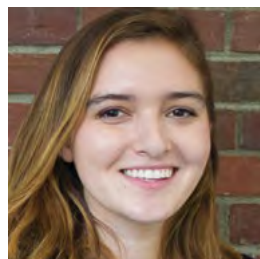


William Pomerantz  
CS 2016  
University of Minnesota Twin Cities  
*Non-canonical Nucleosomal Interactions with BET romodomain-Containing Protein*





**Brian Shuve**  
CS 2021  
Harvey Mudd College  
*Low-Energy Hidden Sector  
Signals at Colliders*



**V. Ashley Villar**  
CS 2025  
Harvard University  
*Luminous Supernovae  
in the Rubin Era*



**Amanda Wolfe**  
CS 2017  
University of North Carolina  
at Asheville  
*Synthesis and Evaluation  
of Small Molecule Antibiotics  
that Inhibit Bioenergetic Enzymes  
in Gram-Negative Pathogens*

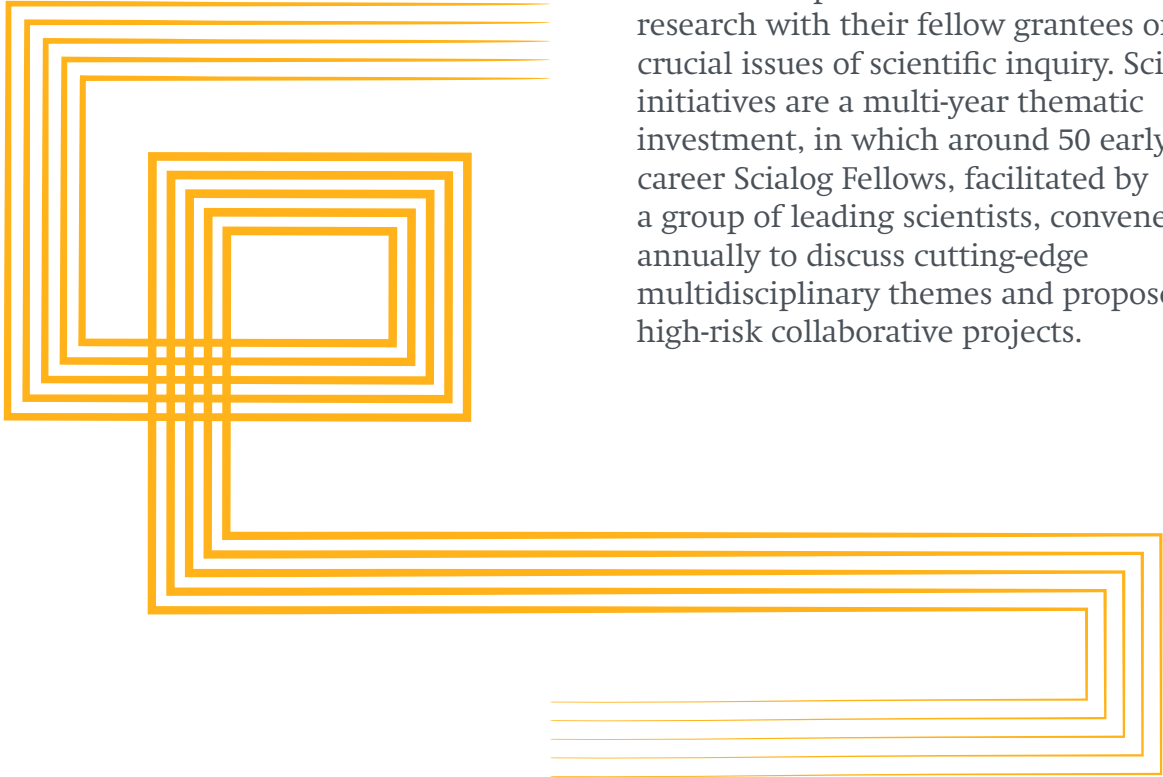


**Jesus Velazquez**  
CS 2020  
University of California, Davis  
*Stabilizing Research and Student  
Training in Multinary Chalcogenides  
and Microenvironment-Driven  
CO<sub>2</sub> Valorization*




**Luisa Whittaker-Brooks**  
CS 2018  
University of Utah  
*Harnessing Chiral Phonons  
for Quantum Transport*

# Scialog = science + dialog



The **Scialog** program was created in 2010 by RCSA, which oversees its administration. Scialog – short for “**science + dialog**” – funds early career scientists to pursue transformative research with their fellow grantees on crucial issues of scientific inquiry. Scialog initiatives are a multi-year thematic investment, in which around 50 early career Scialog Fellows, facilitated by a group of leading scientists, convene annually to discuss cutting-edge multidisciplinary themes and propose high-risk collaborative projects.



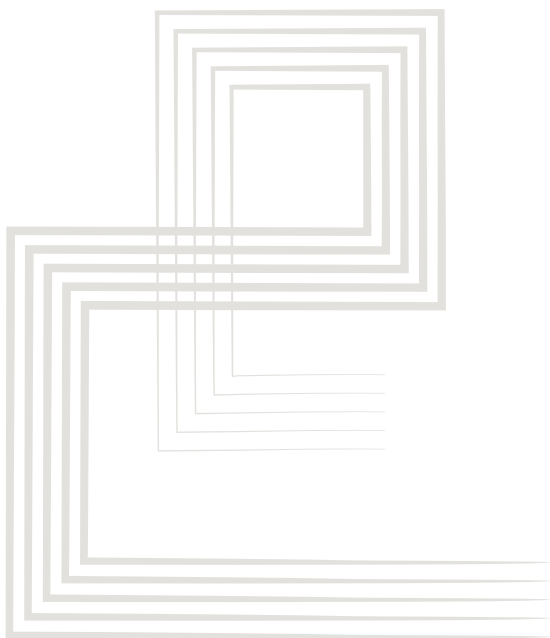
“The Scialog format is fantastic for in-depth discussions, learning about new methods and research problems, and formulating new research ideas. I formed a team with folks I didn’t know before and likely would not have had the opportunity to collaborate with if not for this Scialog.”

**Scialog AUT Fellow Cory Simon**

# Scialog Collaborative Innovation Awards

\$6,120,884.97 was awarded to early career scientists for research through these five multi-year programs.

RCSA convened five Scialog conferences in 2025. RCSA, along with its funding partners, provided a total of \$6,120,884.97 in seed funding for collaborative team projects. In 2025, 92 individual awards of \$60,000 each in direct costs were made.



## Neurobiology and Changing Ecosystems (NCE)

**Goal:** Catalyze new science exploring neurobiological response to rapid and extensive human-caused environmental changes.

**Funding:** Provided by RCSA, the Paul G. Allen Frontiers Group, the Paul G. Allen Family Foundation, the Frederick Gardner Cottrell Foundation, and The Kavli Foundation.

## Automating Chemical Laboratories (AUT)

**Goal:** Catalyze collaborative projects that use artificial intelligence, machine learning, laboratory robotics, high-throughput synthesis, and automated analytical workflows to drive discovery, open access, and transform the way chemical laboratories operate.

**Funding:** Provided by RCSA, the Arnold and Mabel Beckman Foundation, and the Frederick Gardner Cottrell Foundation.

## Sustainable Minerals, Metals, and Materials (SM3)

**Goal:** Catalyze collaborative, cross-disciplinary projects to investigate how to design, manufacture, and recycle substances so that their use and production at scale is more compatible with ethical stewardship of our environment and decarbonizing the energy system.

**Funding:** Provided by RCSA, the Alfred P. Sloan Foundation, and The Kavli Foundation.

## Quantum Matter and Information (QMI)

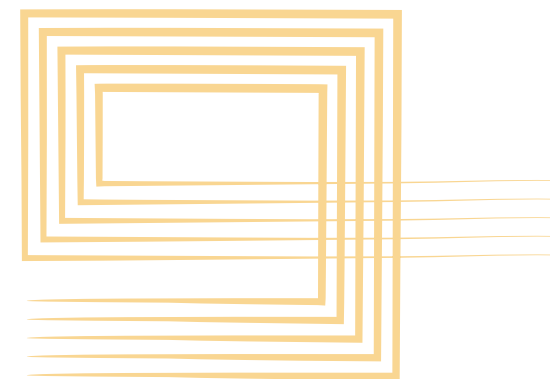
**Goal:** Develop new methodologies and help enhance our understanding of the quantum world with an interdisciplinary perspective.

**Funding:** Provided by RCSA, The Brinson Foundation, Simons Foundation, and Kevin Wells.

## Early Science with the LSST (LSST)

**Goal:** Advance the foundational science needed to realize the full potential of the Vera C. Rubin Observatory's upcoming Legacy Survey of Space and Time.

**Funding:** Provided by RCSA, The Heising-Simons Foundation, the Leinweber Foundation, and Kevin Wells.



# Neurobiology and Changing Ecosystems

## Year 1

*Bee-ing Aware: Monitoring Honey Bee Larval Nutrition, Chemical Exposure, and Neurobiological Effects*

**Ina Anreiter**

Biological Sciences,  
University of Toronto  
Scarborough

**Clare Rittschof**

Entomology,  
University of Kentucky

**Alexander Zestos**

Chemistry,  
American University

*From Feeding to Flux: Unraveling the Impact of Animal Behavior on Global Ocean Carbon Flow*

**Mara Freilich**

Earth, Environmental,  
and Planetary Sciences /  
Applied Mathematics,  
Brown University

**Diana Rennison**

Biological Sciences,  
University of California,  
San Diego

**Jason Keagy**

Ecosystem Science  
and Management,  
Pennsylvania State University

*A Community AI Approach to Identify and Predict Behavioral Motifs Across Marine Life*

**Brian DePasquale**

Biomedical Engineering,  
Boston University

**Matthew Lovett-Barron**

Neurobiology,  
University of California,  
San Diego

**Brandon Weissbourd**

Biology,  
Massachusetts Institute  
of Technology

*Comparative TRPV1 Function in Sensory Adaptability and Resilience to Global Warming*

**Felipe Almeida**

**de Pinho Ribeiro**  
Medicine,  
Washington University  
School of Medicine

**Duncan Leitch**

Integrative Biology  
and Physiology,  
University of California,  
Los Angeles

**Eviatar Yemini**

Neurobiology,  
University of Massachusetts  
Medical School

*Thermal Priming and Parental Care: Investigating Conserved Neural Pathways of Parental Care Plasticity in Response to Heat*

**Ioana Carcea**

Pharmacology, Physiology  
and Neuroscience,  
Rutgers, The State University  
of New Jersey

**Laura Stein**

Biological Sciences,  
University of Oklahoma

**Duncan Leitch**

Integrative Biology  
and Physiology,  
University of California,  
Los Angeles

*Understanding Nanoplastic-Nervous System Interactions within Organisms: A Multipronged Approach*

**Pinar Ayata**

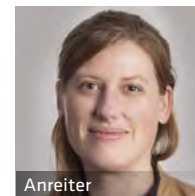
ASRC Neuroscience Initiative,  
The City University of New York,  
CUNY

**Chayan Dutta**

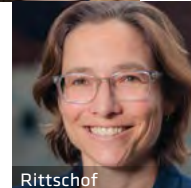
Chemistry,  
Georgia State University

**Zihao Ou**

Physics,  
University of Texas at Dallas



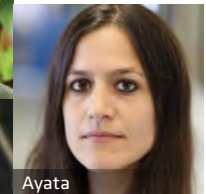
Anreiter



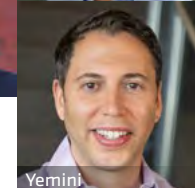
DePasquale



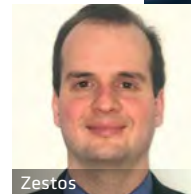
Leitch



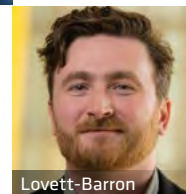
Ayata



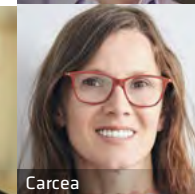
Yemini



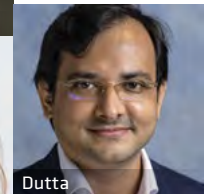
Zestos



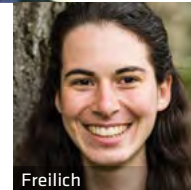
Lovett-Barron



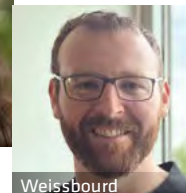
Carcea



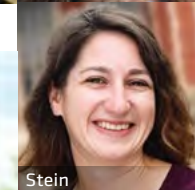
Dutta



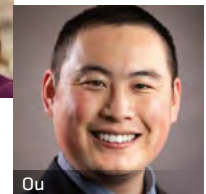
Freilich



Weissbourd



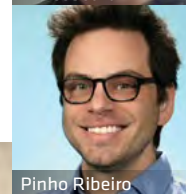
Stein



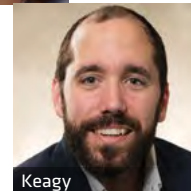
Ou



Rennison



Pinho Ribeiro



Keagy

Funding provided by:  
RCSA, the Paul G. Allen Frontiers Group,  
the Paul G. Allen Family Foundation,  
the Frederick Gardner Cottrell Foundation,  
and The Kavli Foundation.

# Automating Chemical Laboratories

## Year 2

*Achieving the Theoretical Limits of Information Gains in Automated Experimentation under Hardware Restrictions*

**Daniel Schwalbe-Koda**

Materials Science and Engineering, University of California, Los Angeles

**Shijing Sun**

Mechanical Engineering, University of Washington

*Autonomous Discovery of Single-phase High-Entropy Transition Metal Chalcogenides*

**Zakaria Al Balushi**

Materials Science and Engineering, University of California, Berkeley

**Pieremanuele Canepa**

Electrical and Computer Engineering, University of Houston

**Shijing Sun**

Mechanical Engineering, University of Washington

*CrysSolv: A Predictive Program for Solvent-Mediated Molecular Crystallization*

**Michael McGuirk**

Chemistry, Colorado School of Mines

**Andrew Zahrt**

Chemistry, University of Pennsylvania

*Temporally Adaptive Design of Organic Flow Battery Systems*

**Cailin Buchanan**

Materials Science Division, Argonne National Laboratory

**Daniel Tabor**

Chemistry, Texas A&M University

*An Open-Source Modular Automated Laboratory System for Real-Time Monitoring of Continuous Electrosynthesis*

**James Grinias**

Chemistry & Biochemistry, Rowan University

**Long Luo**

Chemistry, University of Utah

**Glen O'Neil**

Chemistry & Biochemistry, Montclair State University

*Automated Design of Next-Generation Anion Exchange Membranes for Fuel Cells and Beyond*

**Cailin Buchanan**

Materials Science Division, Argonne National Laboratory

**Badri Narayanan**

Mechanical Engineering, University of Louisville

**Johanna Schwartz**

Materials Science Division/Physical Life Sciences, Lawrence Livermore National Laboratory

*CRISIS: Comprehensive Reproducibility Initiative for Scientific Integrity and Standardization*

**Mark Hendricks**

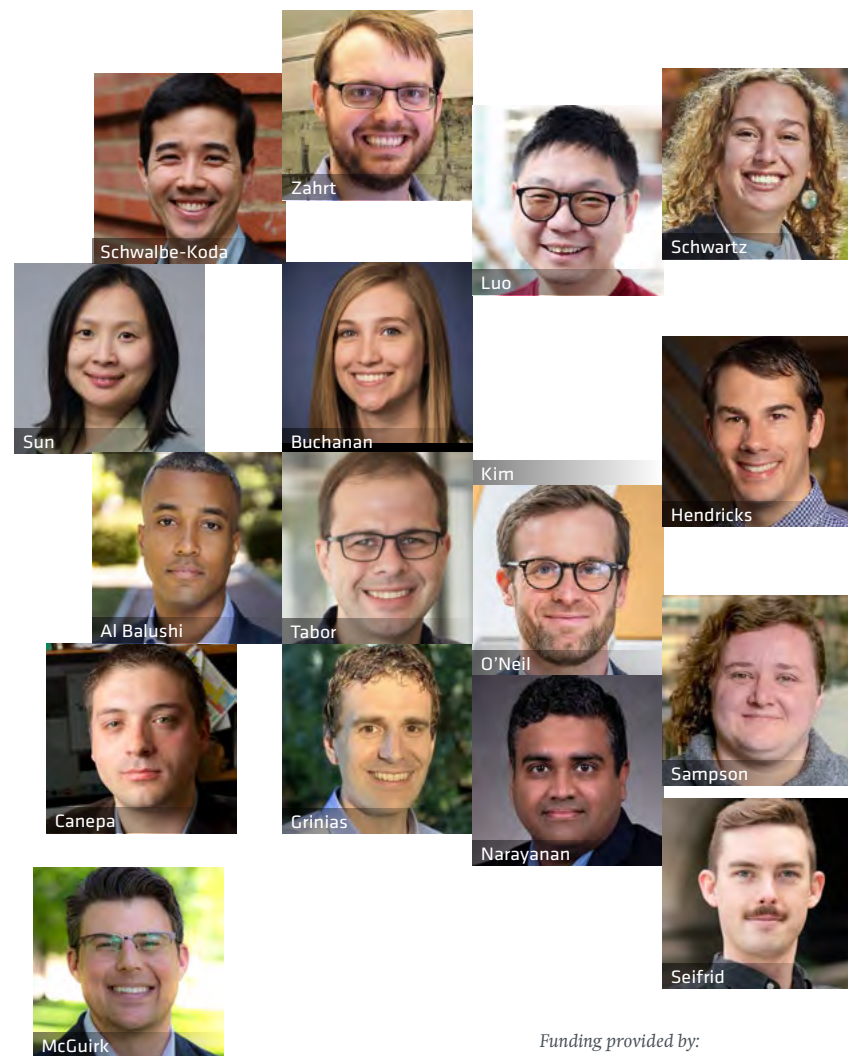
Chemistry, Whitman College

**Jessica Sampson**

Chemistry and Biochemistry, University of Delaware

**Martin Seifrid**

Materials Science and Engineering, North Carolina State University



Funding provided by:  
RCSA, the Arnold and Mabel Beckman Foundation, and the Frederick Gardner Cottrell Foundation.

# Sustainable Minerals, Metals, and Materials

## Year 2

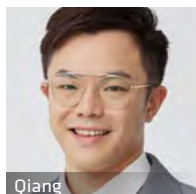
*Layered by Design, Ordered by Process: Single-Material Solution for Sustainable Multilayer Films*

### Zhe Qiang

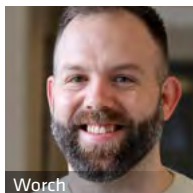
School of Polymer Science and Engineering, University of Southern Mississippi

### Josh Worch

Chemistry, Virginia Polytechnic Institute and State University



Qiang



Worch

*Healable Yet Durable Tires: Localizing Dynamic Interlinks on Particle Surfaces*

### Junsoo Kim

Mechanical Engineering, Northwestern University

### Josh Worch

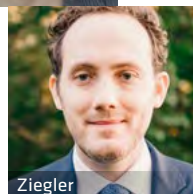
Chemistry, Virginia Polytechnic Institute and State University

### Micah Ziegler

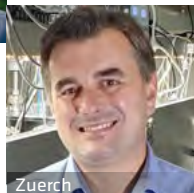
Chemical and Biomolecular Engineering; School of Public Policy, Georgia Institute of Technology



Kim



Ziegler



Zuerch

*Sustainable Lithium Enrichment by Hydrogel-Mediated Solar Evaporation*

### Grace Han

Chemistry & Biochemistry, University of California, Santa Barbara

### Youhong Nancy Guo

Applied Physical Sciences, University of North Carolina at Chapel Hill

### Michael Zuerch

Chemistry, University of California, Berkeley



Han



Guo

*Buoyant Microbes for Bioflotation and Coarse Mineral Separations*

### Thandie Moyo

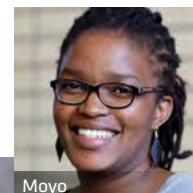
Energy and Mineral Engineering, Pennsylvania State University

### Hunter Schroer

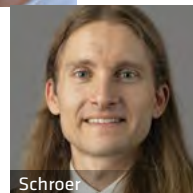
Civil, Architectural and Environmental Engineering, Missouri University of Science & Technology

### Olumide Ogunmodimu

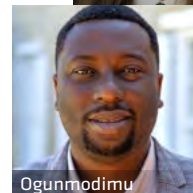
Energy and Mineral Engineering, Pennsylvania State University



Moyo



Schroer



Ogunmodimu

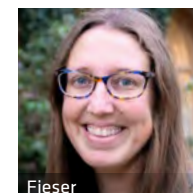
*SECURE Polymerization – Selective Encapsulation by Chelation Using Radiation-Enabled Polymerization*

### Megan Fieser

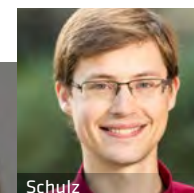
Chemistry, University of Southern California

### Michael Schulz

Chemistry, Virginia Polytechnic Institute and State University



Fieser



Schulz

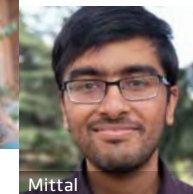
*Poprocks: Coupling Sound, Mechanical and Chemical Dissolution for Direct & Selective Ore Extraction*

### Tushar Mittal

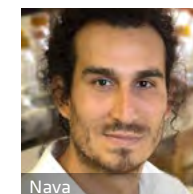
Geosciences, Pennsylvania State University

### Matthew Nava

Chemistry and Biochemistry, University of California, Los Angeles



Mittal

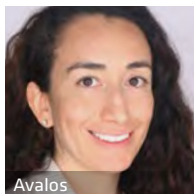


Nava

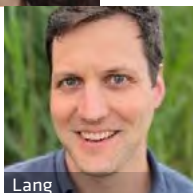
*An Atomic-Level Perspective on Radiation Damage Annealing with Advanced SSNMR Spectroscopy*

**Claudia E. Avalos**  
Chemistry,  
New York University

**Karl Lang**  
Earth and Atmospheric  
Sciences,  
Georgia Institute of Technology



Avalos



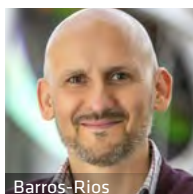
Lang

*Engineering Plant-Based Semiconductors for Solar-Powered Space Agriculture*

**Jaime Barros-Rios**  
(unfunded collaborator)  
Plant Science and Technology,  
University of Missouri

**Jeremy Rech**  
Chemistry and Biochemistry,  
University of North Carolina  
at Asheville

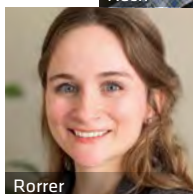
**Julie Rorrer**  
(unfunded collaborator)  
Chemical Engineering,  
University of Washington



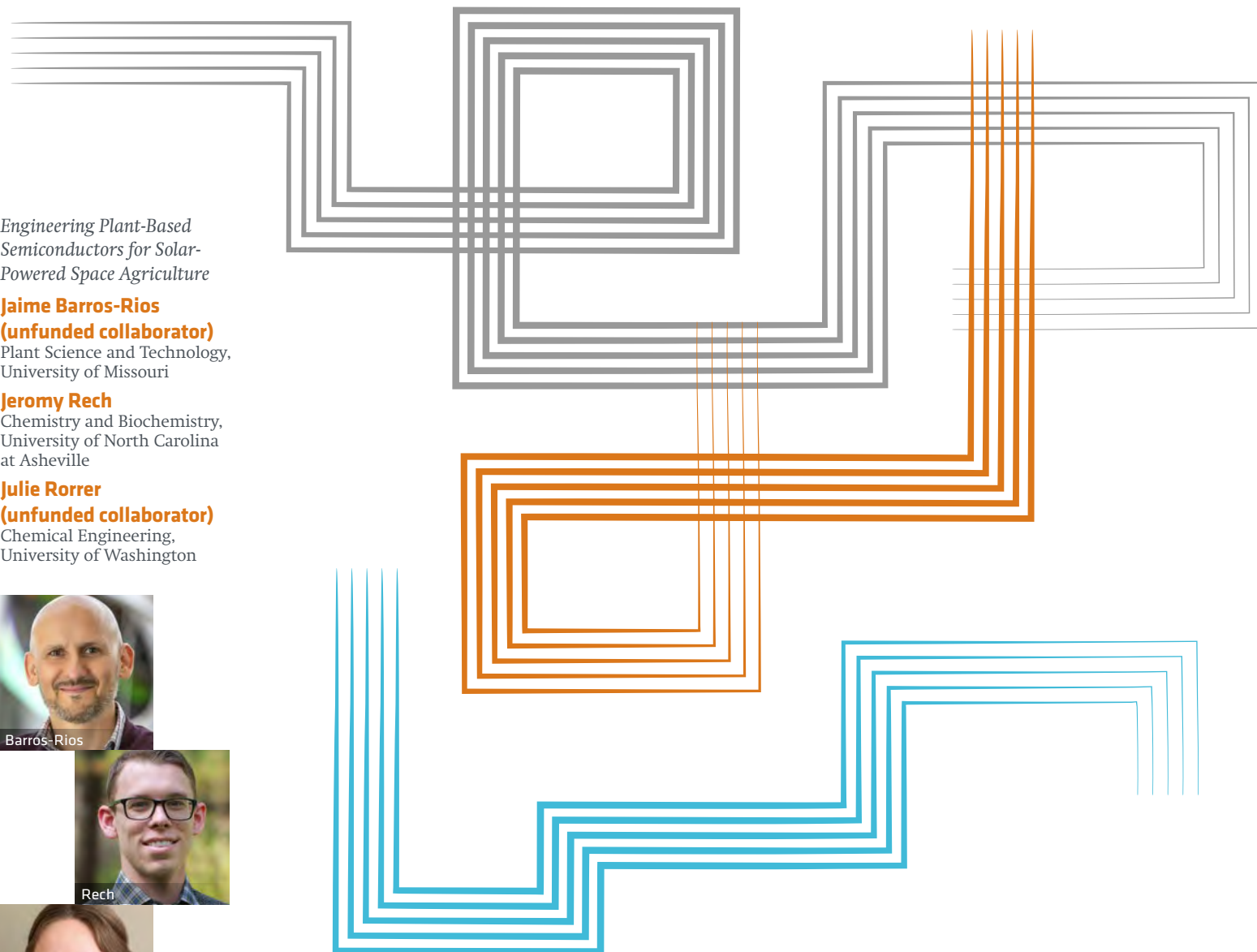
Barros-Rios



Rech



Rorrer



*Funding provided by:*  
RCSA, the Alfred P. Sloan Foundation,  
and The Kavli Foundation.

# Quantum Matter and Information

## Year 1

*Quantum Differential Spectroscopy: Mapping Entanglement in Solids*

**Alex Frañó**

Physics,  
University of California,  
San Diego

**Fang Liu**

Chemistry, Stanford University

**Yao Wang**

Chemistry,  
Emory University

*Spin-Photon Interfaces in Molecular Silicon Clusters*

**Timothy Su**

Chemistry,  
University of California,  
Riverside

**Xueyue (Sherry) Zhang**

Applied Physics  
and Applied Mathematics,  
Columbia University

*Quantum Sensing from Within: Optical Defects as Internal Probes of Correlation*

**Ceren Dag**

Physics,  
Indiana University  
Bloomington

**Elizabeth Goldschmidt**

Physics,  
University of Illinois  
at Urbana-Champaign

**Luis Jáuregui**

Physics and Astronomy,  
University of California, Irvine

**Alex Frañó  
(unfunded collaborator)**

Physics,  
University of California,  
San Diego

*Quantum Entanglement of Skyrmion-Antiskyrmion Pairs*

**Youn Jue (Eunice) Bae**

Chemistry,  
Cornell University

**Serena Eley**

Electrical and Computer  
Engineering,  
University of Washington

**Kazuki Ikeda**

Physics,  
University of Massachusetts  
Boston

*Terahertz Quantum Interconnects Via Reconfigurable Ferron Networks*

**Fang Liu**

Chemistry,  
Stanford University

**Sandhya Susarla**

School of Engineering of Matter,  
Transport and Energy, Arizona  
State University

**Ruijuan Xu**

Materials Science  
and Engineering,  
North Carolina  
State University

*Visualizing Entanglement of Fractional Excitations with Scanning Charge-Noise Spectroscopy*

**Yao Wang**

Chemistry,  
Emory University

**Yonglong Xie**

Physics and Astronomy,  
Rice University

*Loss of Photonic Entanglement: A Novel Probe of Classical and Quantum Spin Dynamics in Materials*

**Fabio Anza**

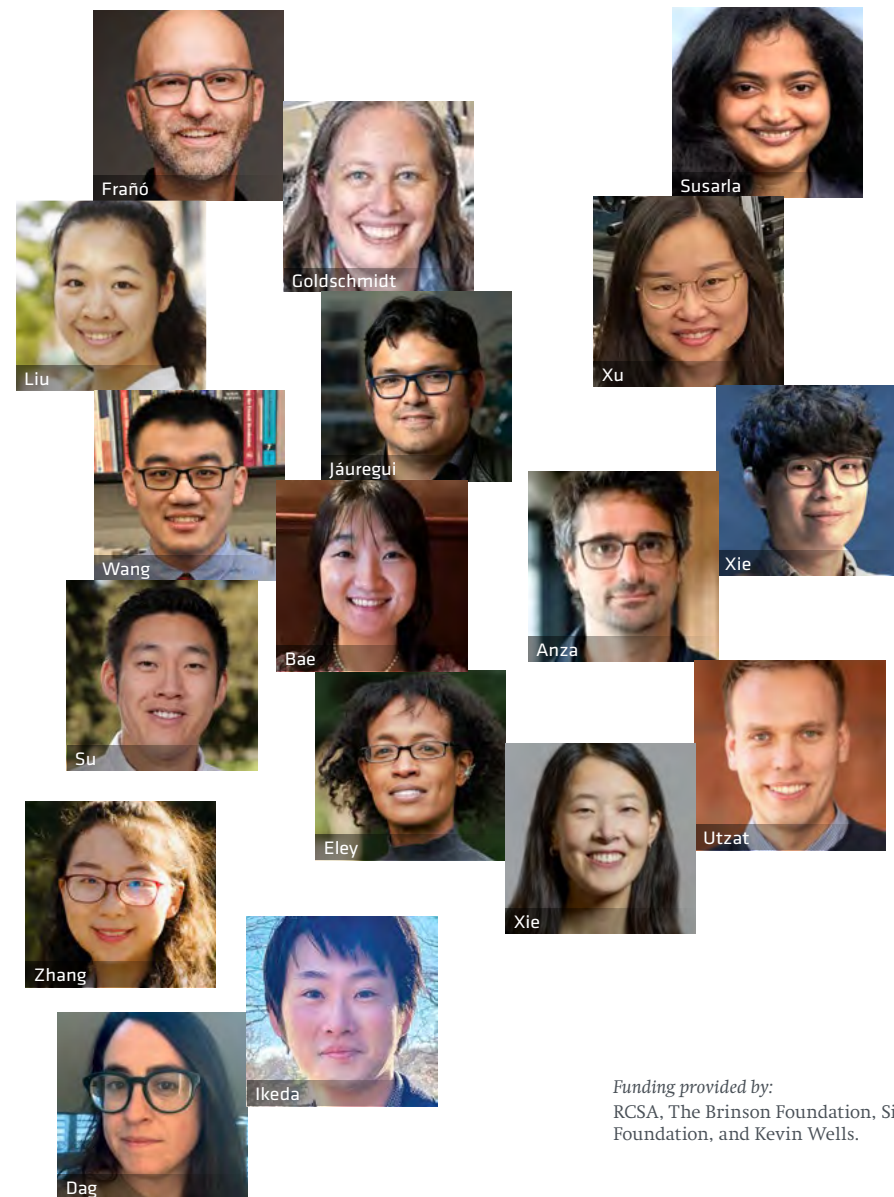
Physics / Cybersecurity  
Institute, University of  
Maryland, Baltimore County

**Hendrik Utzat**

Chemistry,  
University of California,  
Berkeley

**Lilia Xie**

Chemistry/Princeton  
Materials Institute,  
Princeton University



Funding provided by:  
RCSA, The Brinson Foundation, Simons  
Foundation, and Kevin Wells.

# Early Science with the LSST

## Year 2

*Chasing the First Explosions from BH\* with LSST*

**Carl Fields**  
Astronomy,  
University of Arizona

**Wenbin Lu**  
Astronomy,  
University of California,  
Berkeley

**Feige Wang**  
Astronomy,  
University of Michigan

*Democracy Now: Accessible and Rapid Alerts for the Astronomical Community*

**Michael Coughlin**  
Physics and Astronomy,  
University of Minnesota  
Twin Cities

**Mathew Madhavacheril**  
Physics and Astronomy,  
University of Pennsylvania

**Rebecca Phillipson**  
Physics,  
Villanova University

*First Light in the Void*

**Charlotte Christensen**  
Physics,  
Grinnell College

**Alexa de los Reyes**  
Physics and Astronomy,  
Amherst College

**Kristen McQuinn**  
Physics and Astronomy,  
Rutgers University –  
New Brunswick

*Tiny Galaxies, Big Waves: Discovering the First Dwarf Binary AGN Using Early Rubin Data*

**Mithi Alexa de los Reyes**  
Physics and Astronomy,  
Amherst College

**Antonella Palmese**  
Physics,  
Carnegie Mellon University

**V. Ashley Villar**  
Astronomy,  
Harvard University

*Measuring Metallicities of RRLs in the Milky Way Vicinity*

**Nina Hernitschek**  
CITEVA – Centro  
de Astronomía, Universidad  
de Antofagasta, Chile

**Ting Li**  
Astronomy & Astrophysics,  
University of Toronto

*The Impact of the 12C(a,g)16O Reaction Rate on LSST White Dwarfs*

**JJ Hermes**  
Astronomy, Boston University

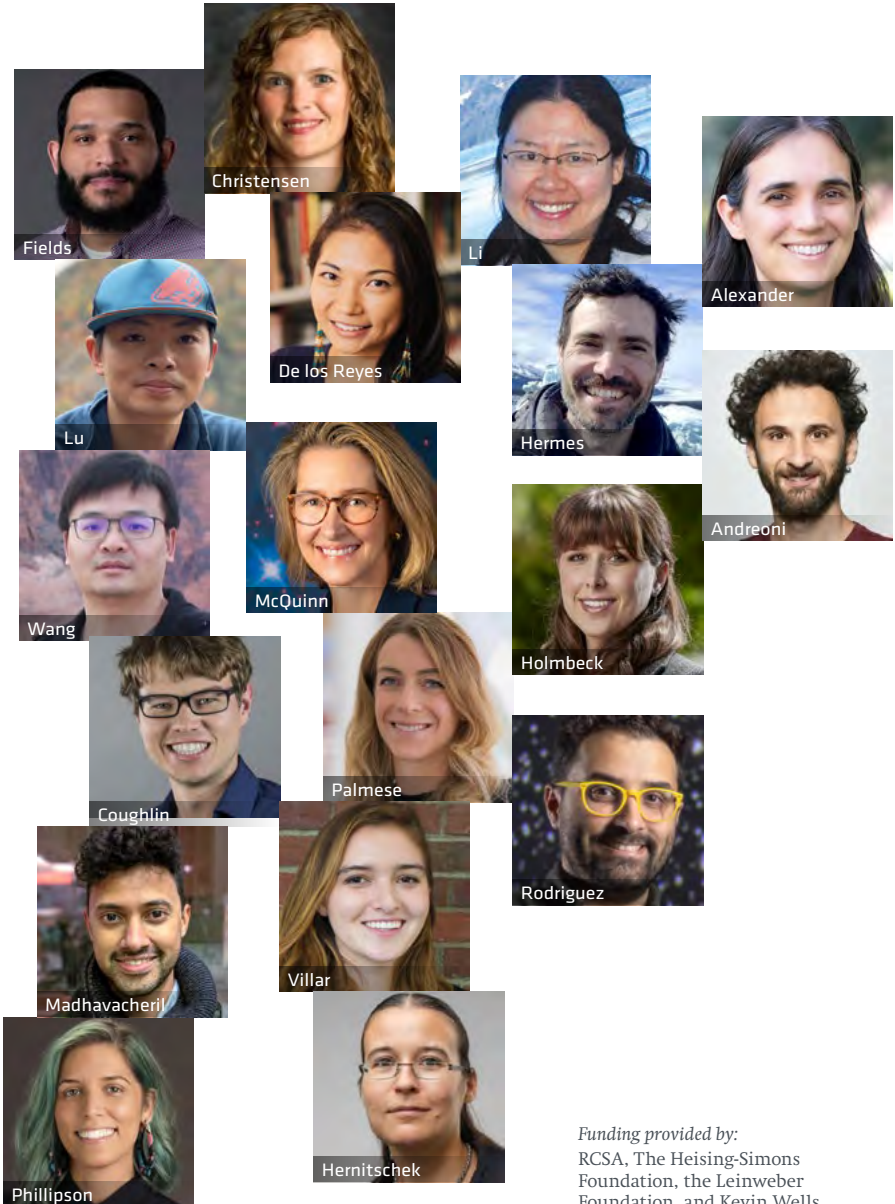
**Erika Holmbeck**  
Nuclear and Chemical  
Sciences, Lawrence Livermore  
National Laboratory

**Carl Rodriguez**  
Physics and Astronomy,  
University of North Carolina  
at Chapel Hill

*Unveiling High-redshift Tidal Disruption Events in Rubin LSST Data*


**Kate Alexander**  
Astronomy,  
University of Arizona

**Igor Andreoni**  
Physics and Astronomy,  
University of North Carolina  
at Chapel Hill



*Funding provided by:*  
RCSA, The Heising-Simons  
Foundation, the Leinweber  
Foundation, and Kevin Wells.

# RCSA Fellows Initiative



The **RCSA Fellows Initiative** aims to advance the scientific enterprise in the United States and Canada by building and strengthening an engaged community of faculty who bring a variety of perspectives, experiences, and backgrounds to teaching and research in the physical sciences. The initiative makes no financial awards but supports the career advancement of each cohort through job-search preparation and community building. This includes pairing participants with host institutions for mock interviews with structured feedback, and through participation in annual conferences that help build a supportive, cross-disciplinary professional network Fellows can rely on throughout and beyond the multi-year cycle of the program. In the initiative's second year, RCSA named 13 postdoctoral scholars as RCSA Fellows.



“It felt great to receive positive feedback on my talk, proposal ideas, and work from faculty at a leading and rigorous institution. The junior faculty also shared openly about their job search experiences and how they set up their labs, which was very insightful!”

**2024 RCSA Fellow Eugenia Vasileiadou**

# 2025 RCSA Fellows



**George Agbaworvi**  
Chemistry,  
Texas A&M University



**Guadalupe Garcia Arellano**  
Physics,  
The City University  
of New York



**Arturo León Sandoval**  
Chemistry and Biochemistry,  
University of San Diego



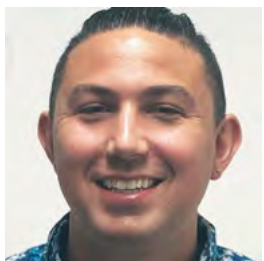
**Kaley Brauer**  
Astronomy,  
Harvard University



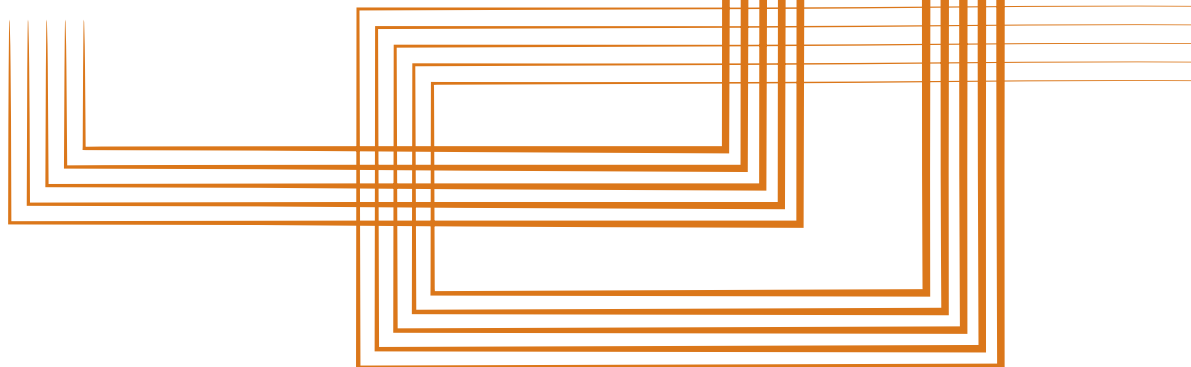
**Tanveer Karim**  
Astronomy,  
University of Toronto



**Alex Malz (not pictured)**  
Physics,  
Carnegie Mellon University



**Conrad Fihn**  
Chemistry and Biochemistry,  
University of California,  
Santa Cruz



# 2025 RCSA Fellows



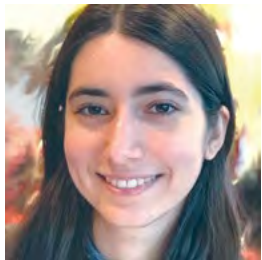
**Justin Myles**  
Astrophysical Sciences,  
Princeton University



**Melissa Quinnan**  
Physics,  
University of California,  
San Diego



**Kunyu Wang**  
Chemistry,  
University of Pennsylvania



**Sanaea Rose**  
Center for Interdisciplinary  
Exploration and Research  
in Astrophysics (CIERA),  
Northwestern University



**Jenna Samuel**  
Astronomy,  
University of Texas at Austin



**Eric Yang**  
Chemistry and Biochemistry,  
University of California,  
San Diego

# 2025 Year in Review

## January

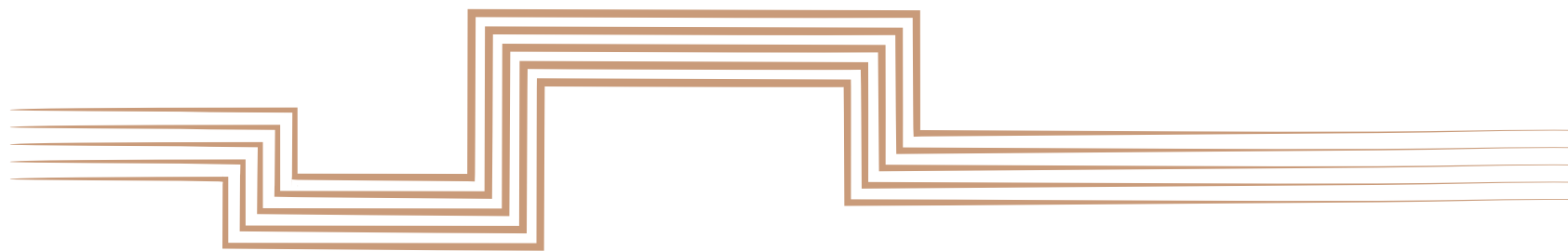
A paper used six years of Scialog meeting data from before, during, and after the COVID pandemic to study the benefits and drawbacks of virtual and in-person conferences. “Face-to-Face or Face-to-Screen: A Quantitative Comparison of Conference Modalities” was published in *PNAS Nexus* with Northwestern University’s **Daniel Abrams** and **Emma Zajdela**, Applied mathematician at Princeton University and Santa Fe Institute, as corresponding authors. RCSA Senior Program Directors **Andrew Feig** and **Richard Wiener**, and former RCSA Data Analytics Specialist **Kimberly Huynh**, were coauthors.

President Joe Biden awarded Cottrell Scholar 2006 **Keivan Stassun** the National Medal of Science for his outstanding contributions to science in service to the United States. Stassun, appointed to the National Science Board in 2023, helped found the Fisk-Vanderbilt Master’s-to-Ph.D. Bridge Program as part of his original CS Award, and the Frist Center for Autism and Innovation with support from a 2017 SEED award. He was a Scialog TDA Facilitator and serves on the RCSA Fellows Advisory Committee.

A paper in *ACS Chemical Biology* on an approach to the in vitro study of type II polyketide synthase was an international collaboration between two members of the Cottrell Scholar community: CS 2018 **Lou Charkoudian**, Haverford College, and Fulbright-Cottrell Scholar 2017 **Ute Hellmich**, Johannes Gutenberg-Universität Mainz. (Charkoudian is also a Scialog CMC Fellow.)

Cottrell Scholar 2014 **Xiaodong Xu**, University of Washington, was selected to receive the 2025 National Academy of Sciences Award for Scientific Discovery for his experimental observation of the fractional quantum anomalous Hall effect. The biennial award was endowed by RCSA and the Frederick Gardner Cottrell Foundation in honor of former RCSA president John P. Schaefer.

Nineteen members of RCSA’s community were among nearly 400 individuals to receive the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor bestowed by the U.S. government on outstanding scientists and engineers early in their careers: Cottrell Scholar 2017 and Scialog Fellow **Laura Chomiuk**, Michigan State University; CS 2020 **Frank Leibfarth**, University of North Carolina at Chapel Hill; CS 2020 **Sharon Neufeldt**, Montana State University; CS 2022 **Zachariah Page**, University of Texas at Austin; CS 2020 **Lorenzo Sironi**, Columbia University; Cottrell College Science Awardee 2002 **Matthew Anderson**, San Diego State University; 2023 Holland Awardee and Scialog Fellow **Robert Gilliard**, Massachusetts Institute of Technology; and Scialog Fellows **Natasha Batalha**, NASA Ames Research Center; **Gurtina Besla**, University of Arizona; **Burcu Gurkan**; Case Western Reserve University; **Kelsey Hatzell**, Princeton University; **Kaitlin Kratter**, University of Arizona; **Allyson Mackey**, University of Pennsylvania; **Raffaella Margutti**, Northwestern University; **Jarad Mason**, Harvard University; **Gary Moore**, Arizona State University; **Barbara Smith**, Arizona State University; **Steven Townsend**, Vanderbilt University; and **Andrew Wetzel**; University of California, Davis.



Cottrell Scholar 2020 and Scialog MZT Fellow **Kristin Koutmou**, University of Michigan, received the RNA Society's 2025 Elisa Izaurreal Award for Innovation in Research, Teaching and Service.

Cottrell Scholar 2023 and Scialog SM3 Fellow **Julian West** published a paper in *Nature Synthesis* on a more sustainable photocatalytic process that eliminates the need for harsh chemicals or high temperatures typically required in chlorination.

Cottrell Scholar 2022 and Scialog TDA Fellow **Wen-fai Fong** had two new studies in *The Astrophysical Journal Letters* tracing a fast radio burst (FRB) to a surprising location – the edge of an 11.3-billion-year-old galaxy.

## February

The sixth Academic Leadership Training (ALT) workshop was held February 20–22 in Baltimore, Maryland. This unique and well-regarded series of leadership workshops to help participants advance through their paths in the physical sciences as department chairs, deans, provosts, or center directors was launched with a 2014 Cottrell Scholars Collaborative grant. Workshops were held in person annually at the American Chemical Society headquarters in Washington, D.C., from 2016 to early 2020, and virtually in 2021. The workshops were restarted in 2025 with further RCSA support by piloting a new “host institution” model, built from a consortium of universities and colleges and designed to put the training program on a long-term path to sustainability.

## March

More than 50 early career chemists, physicists, climate scientists, neurobiologists, and behavioral ecologists met in Tucson for the first convening of Scialog: Neurobiology and Changing Ecosystems, a three-year initiative aiming to spark new science exploring neurobiological response to rapid and extensive human-caused environmental changes. Keynote speaker **Martin Tresguerres**, Scripps Institution of Oceanography, University of California, San Diego, said understanding the dynamic nature of marine environments is crucial for understanding mechanisms that confer neurobiological resilience or vulnerability to changing conditions, whether they are natural or human-induced.

RCSA's longtime support of PUIs (and research by several of our awardees) was highlighted in an editorial in the *Journal of Physical Chemistry A, B, and C* by Cottrell Scholar 1994, Scialog NES Facilitator and SEED Awardee **George Shields**, Furman University. He said PUIs play an



George Shields


important part in the United States scientific infrastructure, as they excel at providing the initial training of undergraduates, who learn the scientific method by hands-on research with their faculty mentors. In addition, he said, PUIs punch above their weight in sending their alumni to research universities where they are part of the graduate student cohorts who do the science that is published in journals.

Cottrell Scholar 2023 and Scialog AUT Fellow **David Leitch**, University of Victoria, was awarded the Dorothy Killam Fellowship. This award is given to leading Canadian researchers for superior, groundbreaking, and transformative research.

Cottrell Scholar 1997 **James (Jim) D. Martin**, North Carolina State University, was awarded the 2025 Herty Medal by the Georgia Section of the American Chemical Society in recognition of outstanding research and service by a chemist in the U.S. Southeast.

Cottrell Scholar 1996 and Scialog AES and AUT Facilitator **Karl Mueller** was named director of the U.S. Department of Energy's Ames National Laboratory, operated by Iowa State University.

Cottrell Scholar 2025 and Scialog AUT Fellow **Nick Jackson** was the Kavli Foundation Emerging Leader speaker at the American Chemical Society meeting in San Diego. His topic: “A Quantum Mechanical Frontier for Polymer Science.”



Thirteen members of RCSA's community of scientists were awarded 2025 Sloan Research Fellowships: Cottrell Scholar 2022 and Scialog ABI Fellow **Scott Cushing**, Caltech; MND Fellow **Cesar de la Fuente**, University of Pennsylvania; NES Fellow **Ariel Furst**, MIT; CS 2022 **Ryan Hadt**, Caltech; CS 2023 **Sarah King**, University of Chicago; CMC Fellow **Tania Lupoli**, New York University; MZT Fellow **Angad Mehta**, University of Illinois, Urbana-Champaign; CS 2022 **Lisa Olshansky**, University of Illinois, Urbana-Champaign; AES and NES Fellow **Linsey Seitz**, Northwestern University; SEC Fellow **Niall Mangan**, Northwestern University; CS 2023 **Daniel Anglés-Alcázar**, University of Connecticut; CS 2024 **Tova Holmes**, University of Tennessee, Knoxville; and SLU Fellow **Jason Wang**, Northwestern University.

## April

The second year of the Scialog: Automating Chemical Laboratories initiative convened in Tucson to network, discuss challenges and bottlenecks, and propose collaborative projects pairing advances in automation and AI to key questions in fundamental research. Keynote speaker and Cottrell Scholar 2003 **Nikki Pohl**, Indiana University, Bloomington, shared lessons learned from 20 years of work as a synthetic organic chemist trying to build more automation into her lab.



AUT Fellows Johanna Schwartz, Jin Qian, and Shijing Sun

On April 8, 66 Holland Awardees and Cottrell Scholars from 25 different classes and 53 different institutions attended a virtual Cottrell Conversation on “Navigating Fast-Changing Landscapes.” Facilitated conversations in four breakout rooms and information sharing on funding uncertainties, mentoring, science communication, and advocacy, among other concerns. As with the Cottrell Conversations held during the COVID pandemic, participants’ candid sharing of “pain points” for teacher-scholars were helpful as RCSA leadership considered how to design appropriate interventions to support its community of researchers.

Three members of RCSA's community were elected to the National Academy of Sciences in recognition of their achievements in original research: Scialog MCL Fellow **Margaret Gardel**, University of Chicago; Scialog MZT Facilitator **Amy Baker**, USDA

Agricultural Research Service; and CS Selection Committee member **Heidi Schellman**, Oregon State University.

Cottrell Scholar 2017 **Amanda Hargrove**, who moved from Duke University to the University of Toronto in 2024, was named a new Canada Research Chair in RNA Targeted Drug Discovery.

Four distinguished members of RCSA's community of scientists were elected 2024 AAAS Fellows: Cottrell Scholar 2010 and Scialog SEC Fellow **Richard Brutchey**, University of Southern California; Scialog MCL Fellow **Polly Fordyce**, Stanford University; CS 2006 and Scialog SEC Fellow **Darren Johnson**, University of Oregon; and CS 2005 **Zhiqiang Mao**, Tulane University.

## May

A distinguished panel – Cottrell Scholar 2018 **Abigail Vieregge**, University of Chicago; CS 2002 and Scialog CMC Facilitator **Neil Kelleher**, Northwestern University; MND Fellow **Stephanie Cologna**, University of Illinois Chicago; and CS 2004 and TDA Facilitator **Vicky Kalogera**, Northwestern University – shared at the May meeting of the RCSA Board of Directors in Chicago how federal funding cuts were affecting their labs and institutions, as well as their thoughts about how RCSA might be able to help.

Cottrell Scholar 1997 and 2024 Cottrell STAR Award recipient **Mark Moldwin**, University of Michigan, published an essay in the *Eos* journal urging senior scientists to use their position and collective power to influence institutional actions and mobilize to support their more vulnerable colleagues during the current attacks on research and education.

**Shainaz Landge,**

Associate Professor of Organic Chemistry and Director of Vertically Integrated Projects Program at Georgia Southern University, was named 2025 recipient of the Council on Undergraduate Research's Silvia Ronco Innovative Mentor Award. The award was established in 2022 by a gift from RCSA.



Shainaz Landge

*Chemical & Engineering News* named four members of the RCSA community to their 2025 Talented 12 for using chemistry to change our world for the better: Scialog AUT Fellow **Herdeline Ardoña**, University of California, Irvine; Scialog NES Fellow **Ariel Furst**, MIT; Cottrell Scholar 2024 **Denise Okafor**, Pennsylvania State University; and Scialog AUT Fellow **Nick Riley**, University of Washington.

Cottrell Scholar 2014 and 2020 FRED Awardee **Cindy Regal**, University of Colorado Boulder, was named one of eight 2025 Brown Investigators by the Brown Institute for Basic Sciences at Caltech. Regal is also a Facilitator for Scialog QMI.

Six members of RCSA's community were among 19 new Camille Dreyfus Teacher-Scholars for 2025: Scialog AUT Fellow **Connor Coley**, Massachusetts Institute of Technology; SM3 Fellow **Thao Tran Dominy**, Clemson University; Cottrell Scholar 2025 and AUT Fellow **Nicholas Jackson**, University of Illinois Urbana-Champaign; NES **Fellow Yuzhang Li**, University of California, Los Angeles; AES and NES Fellow **Linsey Seitz**, Northwestern University; and CMC and ABI Fellow **Lu Wei**, California Institute of Technology.

Cottrell Scholar 2019 **Katherine Mirica** and Fulbright-Cottrell Scholar 2020 **Günther Thiele** published a paper in the *Journal of Chemical Education* on their Cottrell Scholars Collaborative project to create a new virtual reality software to aid with visualization in university-level teaching of materials chemistry.

Scialog MND collaborators **Elaine Hsiao**, UCLA, and **Amina Schartup**, University of California, San Diego, published a paper in *Cell Host & Microbe* on an engineered human gut bacterium that shows promise in reducing mercury absorption from seafood.

Cottrell Scholar 2021 **Eli Levenson-Falk**, University of Southern California, was the senior author of a study in *Nature Communications* demonstrating a

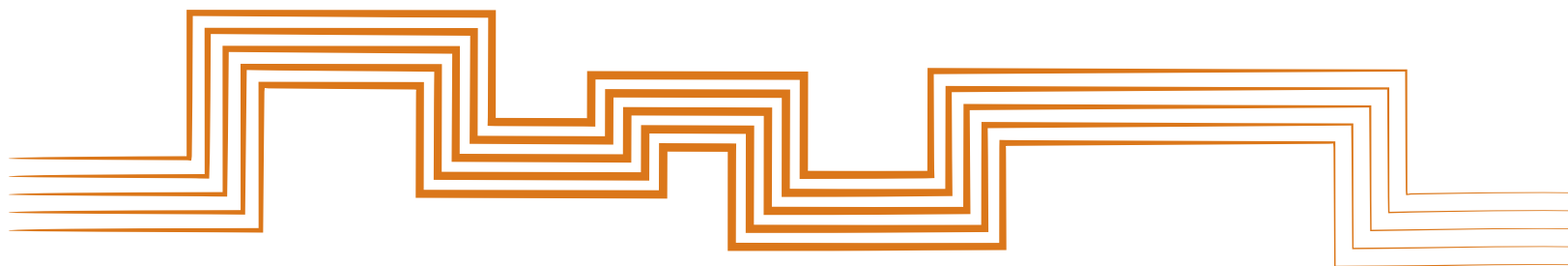
new quantum sensing technique with the potential to accelerate advances in fields ranging from medical imaging to foundational physics research.

## June

Thirteen new RCSA Fellows joined experienced faculty members, program advisers, and a growing community of peers making the postdoc-to-faculty transition June 3–4 at the 2<sup>nd</sup> Annual RCSA Fellows Conference in Tucson. The initiative, launched in 2024, is a multiyear program of job search preparation, professional development, and community building that aims to increase faculty excellence in the physical sciences in the United States and Canada. In her keynote talk, “Maintaining Your Footing and Focus in the Midst of Uncertainty,” Cottrell Scholar 2015 **Jen Heemstra**, Washington University in St. Louis, spoke to the Fellows regarding their two roles: as current postdocs navigating uncertainty in their career prospects, and as future leaders of research groups with students to teach and mentor.



Thirteen new RCSA Fellows in 2025



Cottrell Scholar 2019 **Shahir S. Rizk**, Indiana University South Bend, published a new book, “The Color of North: The Molecular Language of Proteins and the Future of Life.” Coauthored and illustrated with **Maggie Fink**, Adjunct Professor and bacterial geneticist at Indiana University South Bend, the book springs from the educational component of Rizk’s Cottrell Scholar award integrating science communication into his undergraduate biochemistry course.



Shahir S. Rizk and illustration from the book

Three members of RCSA’s community won 2025 Research & Innovation Prizes from the Royal Society of Chemistry: Cottrell Scholar 2010, Scialog NES and AES Facilitator, and SEC Fellow **Sarbajit Banerjee**, and CS 2004 and IMPACT Awardee **Seth Cohen**, won the 2025 Centenary Prize for Chemistry and Communication. Scialog SEC Fellow **James McCusker** won the 2025 Dalton open Prize: Mond-Nyholm Prize for Inorganic Chemistry.

Cottrell Scholar 2023 and Scialog AUT Fellow **Daniel Tabor**, Texas A&M University, 2025 won the *Journal of Physical Chemistry C* Award: Energy, Materials, and Catalysis for his work focusing on the computational design of organic and polymeric materials, developing new computational spectroscopy methods, building models to understand mechanochemistry, and scientific machine learning methods.

Cottrell Scholar 2021 and Scialog CMC Fellow **Alexis Komor**, University of California, San Diego, published a paper in *Nature Communications* on the genetic mechanisms governing cytosine base editing outcomes through CRISPRi screens.

## July

A multigenerational community of Cottrell Scholars representing all but four cohorts since the program was started in 1994 gathered July 16–18 in Tucson for RCSA’s 31<sup>st</sup> annual Cottrell Scholar Conference on the theme of “Expanding Access to STEM Education.” The community now includes more than 500 Cottrell Scholars, Fullbright-Cottrell Scholars from Germany, and senior scientists who have received RCSA’s Robert Holland Jr. Award. **Archie Holmes**, Executive Vice Chancellor for Academic Affairs at the University of Texas System, gave an interactive keynote session exploring the recent consensus study report from the National Academies, “Transforming Undergraduate STEM Education: Supporting Equitable and Effective Teaching.”



2025 Cottrell Scholars and Holland Awardees

Cottrell Scholar 2021 and Scialog CMC Fellow **Alexis Komor** received the 2026 Eli Lilly Award in Biological Chemistry from the American Chemical Society’s Division of Biochemistry and Chemical Biology. Her contributions to the genome editing and nucleic acid chemistry fields include the groundbreaking development of the first base editor, which enabled the direct conversion of one base pair to another via enzymatic chemical modification DNA nucleobases.

Cottrell Scholar 2015 **Jen Heemstra**, Washington University in St. Louis, published a new book, “Labwork to Leadership: A Concise Guide to Thriving in the Science Job You Weren’t Trained For.” In it, she says the scientific enterprise needs people who can strategize, communicate, and lead with empathy.

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Scialog NES Fellows **Pratik Dholabhai**, Rochester Institute of Technology, and **William Bowman**, University of California, Irvine, were awarded a three-year, \$450K grant from the National Science Foundation's CBET Process Systems, Reaction Engineering, and Molecular Thermodynamics program for "Collaborative Research: Elucidating Cycling and Deactivation Mechanisms of Earth-abundant CO<sub>2</sub> Looping Sorbents under Precise Temperature Control." Their project is based on discussions they had at Scialog.

Cottrell Scholar 2022 **Zachariah Page**, University of Texas at Austin, published a paper in *Nature Materials* on a new approach in 3D printing that uses light to combine hard and soft properties in novel resins.

## August

14 members of the RCSA community were named American Chemical Society 2026 national award winners: Cottrell Scholar 2010 and SEC Fellow **Joshua S. Figueroa**, University of California San Diego, F. Albert Cotton Award in Synthetic Inorganic Chemistry; CS 1996 **Gregory C. Fu**, California Institute of Technology, **Arthur C. Cope** Award; CS 1995 and Scialog CMC, MBC, MCL Facilitator **Martin Gruebele**, University of Illinois Urbana-Champaign, Peter Debye Award in Physical Chemistry; CS 2010 **Song Lin**, Cornell University, Nobel Laureate Signature Award for Graduate Education in Chemistry; Holland Awardee **Angel Martí**, Rice University, ACS Award for Encouraging Underrepresented and Economically

Disadvantaged Students into Careers in the Chemical Sciences; CS 1999 **Scott J. Miller**, Yale University, Gabor A. Somorjai Award for Creative Research in Catalysis; Scialog NES Fellow **Phillip J. Milner**, Cornell University, ACS Award in Pure Chemistry; Scialog SEC Facilitator **Jonas C. Peters**, California Institute of Technology, ACS Award in Inorganic Chemistry; CS 2003 **Brian Stoltz**, California Institute of Technology, Ernest Guenther Award in the Chemistry of Natural Products; Scialog AES and NES Fellow **Haotian Wang**, Rice University, Marks-Ipatieff Award in Catalysis; CS 2008 **Tehshik P. Yoon**, University of Wisconsin-Madison, David A. Evans Award for the Advancement and Education of Organic Synthesis; CS 2005 Adam R. Urbach, Trinity University, ACS Award for Research at an Undergraduate Institution, sponsored by RCSA; CS 2007 **Alexander Deiters**, University of Pittsburgh, and Scialog SEC Facilitator **Mark E. Thompson**, University of Southern California, Arthur C. Cope Scholar Awards.

Scialog ABI collaborators **Nick Galati**, Western Washington University, and **Doug Shepherd**, Arizona State University, published a paper in *Science Advances*, "Fourier Synthesis Optical Diffraction Tomography for Kiloherz Rate Volumetric Imaging."

## September

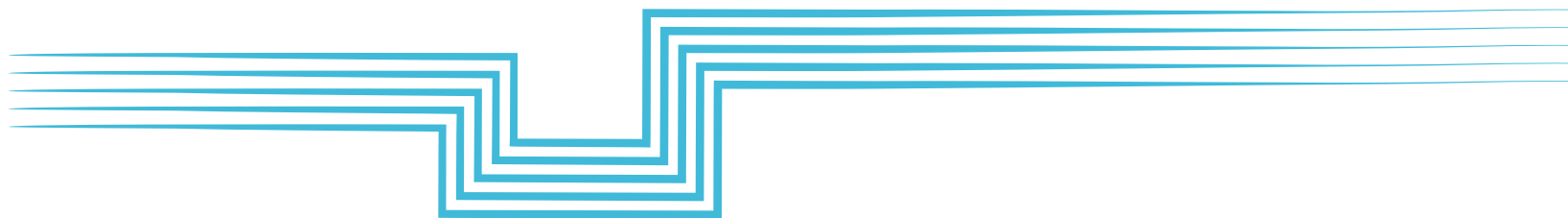
Fellows from multiple disciplines, approaches, and methodologies convened September 10–13 in Tucson to brainstorm ideas on how to acquire, use, and recycle the critical materials that sustain our high-tech society at the second meeting of Scialog:

Sustainable Minerals, Metals, and Materials. Keynote speaker and Cottrell Scholar 2013 **Eric Schelter**, University of Pennsylvania, set the stage for discussions by highlighting the range of problems to address and the current climate for doing fun and fundable basic science in his talk, "Challenges and Opportunities in Critical Metals Separations Chemistry."



Scialog: Sustainable Minerals, Metals, and Materials attendees

Cottrell Scholar 2021 and Scialog QMI and MBC Fellow **Alex Frañó**, University of California, San Diego, published a paper in the *American Journal of Physics*, "Incorporating a Research Project and Coding Exercises into Existing Undergraduate Physics Courses." The pedagogical strategies, which can be adapted to other introductory science courses, stem from the educational portion of his



Cottrell Scholar Award. Scialog SLU Fellows **Jennifer Glass** and **Sarah Hörst** had an article in the *Annual Review of Earth and Planetary Sciences*, “The Once and Future Gas: Methane’s Multifunctional Roles in Earth’s Evolution and Potential as a Biosignature.” Though they were not funded together, this project grew out of discussions they had at Scialog.

## October

The inaugural meeting of Scialog: Quantum Matter and Information was held October 16–19 in Tucson to build better connections between different sectors of the quantum science community and help enhance our understanding of the quantum world with an interdisciplinary perspective. **Xiaoyang Zhu**, Columbia University, and **Rana Adhikari**, California Institute of Technology, provided thought-provoking keynote talks.

Scialog LSST Fellow **Kareem El-Badri**, California Institute of Technology, and Scialog NES and SM3 Fellow **Will Tarpeh**, Stanford University, were named 2025 MacArthur Fellows.

Cottrell Scholar 2020 **Frank Leibfarth**, University of North Carolina at Chapel Hill, was named one of three 2025 winners of the Blavatnik National Awards for Young Scientists for his “pioneering approaches to upcycle plastic waste and remove toxic ‘forever chemicals’ from water.” Also among the finalists: CS 2018 **Nathaniel Craig**, Northwestern University;

Scialog AES Fellow **Matthew McDowell**, Georgia Institute of Technology; CS 2020 Song Lin, Cornell University; and CS 2017 and Scialog AES Fellow **Yogi Surendranath**, Massachusetts Institute of Technology.

Cottrell Scholar 2022 and Scialog ABI Fellow **Scott Cushing** was featured in *Chemical & Engineering News*’ 2025 Trailblazer issue. In an interview, he talked about changing the conversation around mental health and disabilities in chemistry by building spaces where students can focus on support and well-being.

Four Scialog Fellows were among 20 innovative early career researchers named 2025 Packard Fellows for Science and Engineering: QMI Fellow **James Gaynor**, Northwestern University; NES Fellow **Dohyung Kim**, University of Pennsylvania; NES Fellow **Azahara Oliva Gonzalez**, Cornell University; and NES Fellow **Benjamin Snyder**, University of Illinois, Urbana-Champaign.

Four members of RCSA’s community were elected American Physical Society Fellows for 2025: Cottrell Scholar 2018 **Abigail Vieregge**, University of Chicago; Scialog MCL Fellow **Ariel Amir**, Harvard University; CS 2007 **Peter Love**, Tufts University; and Scialog MCL Fellow **Steve Pressé**, Arizona State University.

Cottrell Scholar 2021 and Scialog QMI Fellow **Justin Caram**, University of California Los Angeles, was named one of the Gordon and Betty Moore Foundation’s 2025 Experimental Physics Investigators.

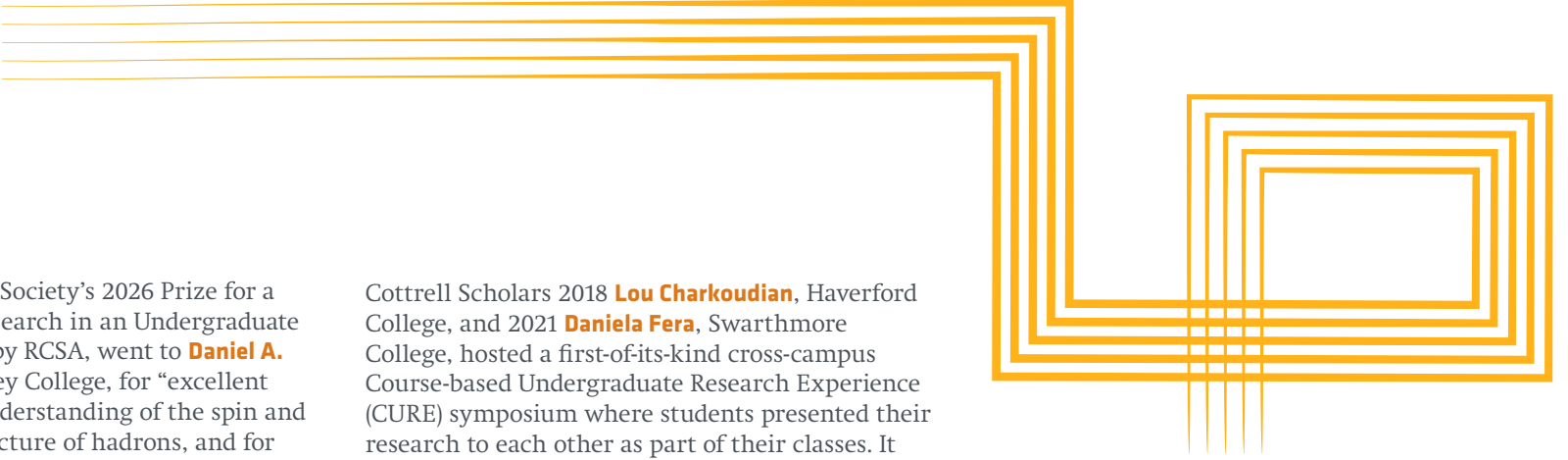
Cottrell Scholar 2022 and Scialog ABI Fellow **Scott Cushing**, and Scialog SM3 Fellow **Grace Han**, were among five aspiring inventors selected as 2005 Moore Inventor Fellows.

## November



Scialog: Early Science with the LSST attendees

The second meeting of Scialog: Early Science with the LSST was held November 13–16 in Tucson to ignite discovery with the Vera C. Rubin Observatory’s upcoming Legacy Survey of Space and Time. Over the next decade, the survey will use the largest digital camera ever built to capture billions of galaxies, stars, and transient events, mapping the universe in unprecedented detail. Holland Awardee **Enrico Ramirez-Ruiz**, University of California, Santa Cruz, gave the keynote talk, “The Calm Before the Boom: Astrophysical Transients and Stellar Stories with the Vera C. Rubin Observatory.”



The American Physical Society's 2026 Prize for a Faculty Member for Research in an Undergraduate Institution, sponsored by RCSA, went to **Daniel A. Pitonyak**, Lebanon Valley College, for "excellent contributions to our understanding of the spin and multi-dimensional structure of hadrons, and for outstanding mentoring of undergraduate students by engaging them in high-impact research projects."

Cottrell Scholar 2021 **Jeanine Amacher**, Western Washington University, was named one of eight new Henry Dreyfus Teacher-Scholars for 2025.

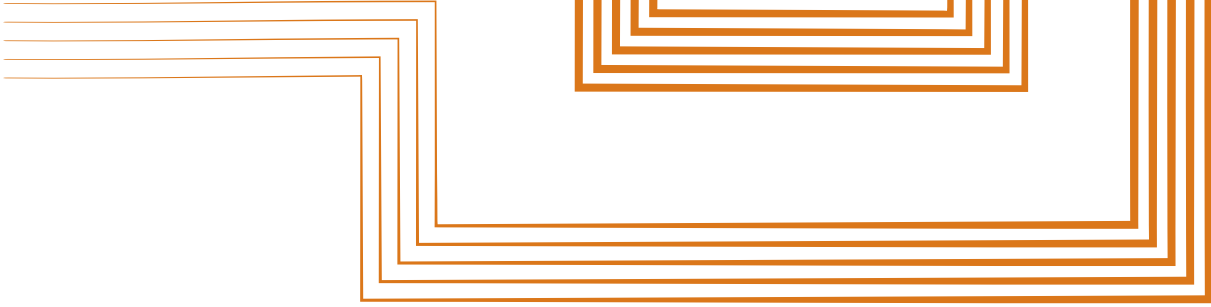
2012 Cottrell Scholar and 2020 SEED Awardee **Seth Herzon**, Yale University, published a paper in *Science* about his lab's work synthesizing (-)-gukulenin A (which has shown promise in treating murine models of ovarian cancer) for the first time.

## December

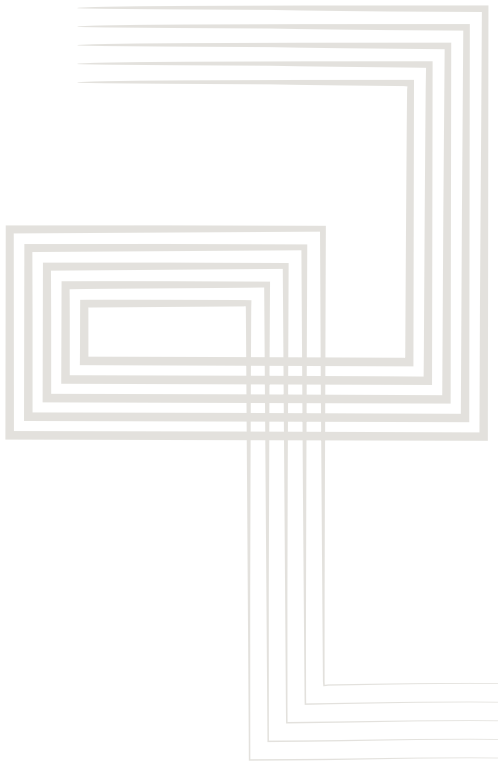
Scialog SLU Fellow **Peter Gao**, Carnegie Institution for Science, coauthored a paper in *The Astrophysical Journal Letters* that was highlighted in the New York Times. Cottrell Scholar 2019 and Scialog TDA Fellow **Emily Rauscher**, University of Michigan, was also quoted in the article.

Cottrell Scholars 2018 **Lou Charkoudian**, Haverford College, and 2021 **Daniela Fera**, Swarthmore College, hosted a first-of-its-kind cross-campus Course-based Undergraduate Research Experience (CURE) symposium where students presented their research to each other as part of their classes. It involved 28 students (14 from each college) who worked in small teams to prepare and present research carried out as part of their course work. RCSA has long supported awardees' efforts to adopt innovative pedagogical approaches such as CURE, and advances in teaching and mentoring approaches are frequent topics at Cottrell Scholar conferences.

Through staff donations and matching gifts by the foundation, RCSA contributed nearly \$17,000 total in December to two organizations serving people in need in Tucson: the Community Food Bank of Southern Arizona and Aviva Children's Services.



# 2025 Financial Summary

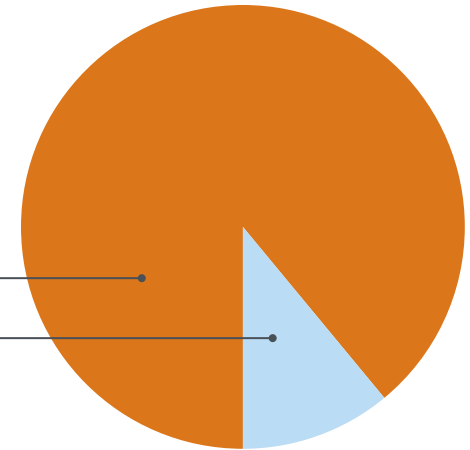


## Where The Money Goes

Program Expenses,  
including Grants and Awards **90%**

General and Administrative Costs **10%**

**Total Expenses \$16.5M**



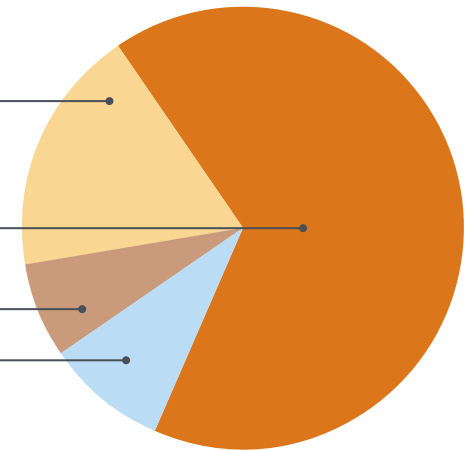
Cottrell Scholar Awards **18%**

Scialog Collaborative Awards  
*(includes \$4.7M in partner-funded awards administered by RCSA and excludes \$462K in non-administered partner-funded awards)* **66%**

Cottrell Career Advancement,  
Collaborative Awards, and Holland Awards **7%**

Discretionary Grants and Special Initiatives **9%**

**Grants and Awards \$10.9M**



Net Assets at Beginning of Year **\$237.1M**

Net Assets at End of Year **\$262.3M**

The financial activities of Research Corporation for Science Advancement were audited by Keegan Linscott & Associates, PC. For the complete audited financial statements, please visit our website at [rescorp.org](http://rescorp.org).

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# Dan Linzer Retires

## 8 Years of Collaboration and Connection



**Daniel Linzer** retired as President & CEO of RCSA on July 1, 2025, leaving a strong organization well-poised to continue its mission, not just as a funder but as an engaged participant in the larger fabric of science.



During his eight years guiding the foundation, RCSA expanded its emphasis on community building as a way to welcome a broader array of physical scientists – across backgrounds, disciplines, experiences, institutions, and regions.

As scientific challenges increasingly cross disciplinary boundaries, RCSA broadened its definition of physical sciences, easing disciplinary restrictions to expand eligibility to more fields. It also reopened its programs to scientists at institutions in Canada, which had been closed in response to the 2008 financial crisis.

Linzer said RCSA's response to the COVID pandemic represented some of the most gratifying efforts of his time at the foundation.

“People were hurting and scared that their careers were getting off-track, and they needed more than money,” Linzer said. “By creating the Cottrell Conversations, for example, RCSA helped faculty discuss how to switch rapidly from in-

person to online education. Those conversations also contributed to an understanding of where additional resources would do the most good.”

Linzer said changes RCSA made to its programs and awards processes in recent years reflect a holistic, participant-driven approach that actively engages cohorts of scientists in discussing their needs and participating in decision-making and assessment.

One example was the Robert Holland Jr. Award, established in 2023 in response to the community's desire to welcome into its ranks more senior researchers with significant experience and impact in making the physical sciences an endeavor in which all students can thrive. “The resulting response from the CS community has been pure enthusiasm,” Linzer said.

The Scialog program has changed too, expanding to a maximum of six meetings per year, launching new themes connecting physical and life sciences, and working in partnership with more than 30 other foundations, federal agencies, and private philanthropists.

“As a way to spark interdisciplinary collaboration, Scialog is a model that has influenced the thinking of other organizations,” Linzer said.

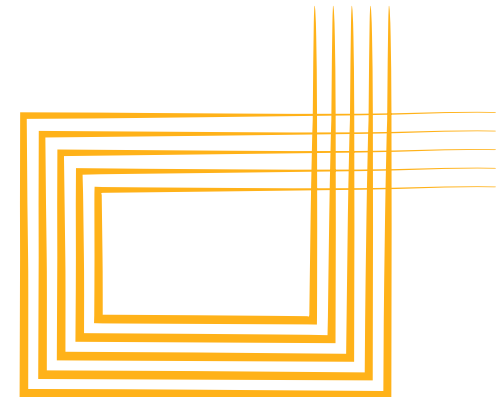
Building on a Cottrell Scholars Collaborative project RCSA funded in 2017, RCSA also launched the RCSA Fellows Initiative in 2024 to support outstanding

early career scientists through the transition from postdoctoral trainee to independent scientist.

RCSA's operations became more robust during Linzer's presidency, with the addition of two new program directors and a grants management team with expertise in subawards and federal contracts, broadening the organization's capacity to welcome more participants and engage new partners.

At a time when the scientific enterprise is under attack, he said RCSA is positioned to use its convening and connecting powers to help reimagine a more sustainable and efficient future for science.

“The way science is done is changing,” Linzer said. “We don't want the future to just happen to us. We can help design it.”





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