

# Developing Possibilities

2017 Annual Report



RESEARCH CORPORATION  
*for* SCIENCE ADVANCEMENT

*A foundation dedicated to science since 1912.*

# Opportunities for Discovery



Daniel Linzer

Greetings from Tucson! I am very pleased to have moved to one of the nation's first foundations dedicated to supporting science research and teaching in universities and colleges. Over my first few months at Research Corporation for Science Advancement (RCSA), I have heard from many of you about the impact the Foundation has had, and about the opportunities to catalyze scientific discovery and teaching innovation in the years ahead.

After the announcement of my appointment, I heard from several scientists that their first grants were from RCSA. The descriptions of the impact of these grants motivated a look at earlier grants, in particular those for which the current year would be the 50th anniversary. In this report, we feature a brief essay on the shared values and experiences of three of those academic-based scientists—E. Norval Fortson and Marshall Wilt, who are in the 50th anniversary group, and Tom Meade, who was a more recent recipient. Their full stories appear on the RCSA website at <http://rescorp.org/news/profiles>.

I have also been listening extensively to our recent support recipients, both Cottrell Scholars, the cohort of our early career faculty award recipients who combine excellence in teaching and research, and Scialog Fellows, early career scientists selected to participate in our unique workshops, which encourage the development of interdisciplinary, high-risk/high-reward research projects on the fundamental science underlying challenges we face as a society. Both Cottrell Scholars and Scialog Fellows have been emphatic that the most significant, long-term payoff of RCSA's support has been their inclusion in a community from different disciplinary fields. RCSA's establishment and nurturing of these scientific networks have enabled faculty to form collaborations to tackle new questions. For Cottrell Scholars, they also value the shared, strong commitment of their colleagues to the combination of research, teaching, and institutional citizenship.

These members of the RCSA community make clear that science is very much a social activity: learning each other's vocabulary, willingly sharing ideas that might seem far-fetched, and linking complementary skill sets through interdisciplinary collaboration provide the essential foundation from which truly innovative and transformative science can grow. This report showcases the science and scientists involved in several RCSA-supported projects that have resulted in exciting discoveries.

“These members of the RCSA community make clear that science is very much a social activity: learning each other’s vocabulary, willingly sharing ideas that might seem far-fetched, and linking complementary skill sets through interdisciplinary collaboration...”

Research Corporation also puts into practice at the foundation level this principle of collaboration. Our partnerships aim to combine resources and expertise to achieve much greater impact in advancing science: with the Association of American Universities on STEM education, with the American Chemical Society on new faculty orientation and faculty leadership programs, and with the Gordon and Betty Moore Foundation, the Heising-Simons Foundation, the Simons Foundation, and the Lyda Hill Foundation on innovative research in the physical sciences. The results are compelling, that foundations and associations working together can achieve very positive synergy in promoting science research, science teaching, and scientist career development.

As we move forward, we will continue to emphasize these core values: community and collaboration. We are committed to building and maintaining community and collaborative networks by engaging with our Cottrell Scholars throughout their careers, with opportunities for funding through Cottrell Plus awards and for connecting to other scientists through the Foundation’s committees and programs, and with our Scialog Fellows, by organizing a series of thematic meetings that help take their research in new directions.

I am excited about what we can accomplish together, and as always I welcome your thoughts and comments. Please feel free to write me directly at [dlinzer@rescorp.org](mailto:dlinzer@rescorp.org) with your ideas.

**Daniel Linzer**

President and CEO

Research Corporation for Science Advancement

# Much Has Been Accomplished



Elizabeth McCormack

“By supporting bold young scientists, their ideas, their leadership, and their community as teacher-scholars...we are investing in a diverse cohort of scientists who will shape their fields...”

It gives me great pleasure to reflect on my nine years serving on the Board of Directors of RCSA, including the last three as Board Chair. Much has been accomplished through the focused and thoughtful work of the incredible team at the Foundation. In my mind, three projects define the innovative work of RCSA over the last decade:

1. In 2010 we launched the new Scialog program built on new ideas about convening, networking, and funding structures to further breakthrough scientific research. We were inspired by David Bohm’s work, *On Dialogue*, and applied his ideas to scientific collaboration. By bringing promising emerging young scholars together with proven leaders, new collaborations to tackle important, yet taxing, issues were stimulated at key interdisciplinary boundaries. Scialog has earned perhaps the best flattery it can, as now many imitate its successful convening format. The Scialog enterprise has also proven to be an effective instrument to leverage RCSA’s capacity. Over the course of the program we have held 11 Scialog meetings in four different areas of research—solar energy conversion, time domain astrophysics, physical cell biology, and advanced energy storage—engaged with seven outside partners, and added more than three million dollars to our grant-making ability with several million more from outside partners committed to future Scialogs.
2. During my time we also completed a major restructuring of RCSA’s two traditional faculty grants programs, combining them into a new Cottrell Scholar program whose design and attributes were informed by a comprehensive strategic planning effort. By supporting bold young scientists, their ideas, their leadership, and their community as teacher-scholars, from a range of institution-types, we are investing in a diverse cohort of scientists who will shape their fields and pursue the toughest and most important scientific challenges. Change is one of the most difficult things we have pursued together, and the commitment of the RCSA team to make tough choices has strengthened the Foundation’s ability to meet its objectives.
3. The strategic planning exercise we undertook also highlighted the need for us to articulate what success looks like for RCSA’s signature programs. After much discussion of the elusive and unpredictable nature of open-ended basic research and several appropriate types of evidence we might track, we devised a workable framework with which to examine the effectiveness of our programs and use to uncover hints as to how to improve them. This work is ongoing and holds promise to be useful to other foundations with similar challenges in assessing impact.

I echo the message of President Linzer in recognizing the pillars of collaboration and community that support the mission of RCSA. It has been a gift to be engaged with such a diverse board of academics and professionals in both the public and private sector. The diversity of experience and thought has led to robust decision making, and I am deeply grateful for all that I have learned from my Director colleagues and the talented staff at RCSA. I have great confidence in the RCSA team and look forward to celebrating its successes for a long time to come.

**Elizabeth McCormack**  
Outgoing RCSA Board Chair

## Dear RCSA Family



Brent L. Iverson

“RCSA will continue to develop the science and scientists who are together making a brighter future for all of us.”

The RCSA board's heartfelt gratitude goes to Liz McCormack for being an inspiring board member and chair, most recently seeing us through the presidential search process and leadership transition. She made many important contributions to the RCSA mission during her time on the board, and her steady hand as chair kept us moving decidedly forward in this important moment in RCSA history. We are also deeply indebted to Danny Gasch for stepping in to become an effective Interim President during the presidential search.

I would also like to take this opportunity to welcome Dan Linzer as the new President of RCSA. In his brief time at the helm, he has already demonstrated a strong commitment to RCSA and a powerful vision for the future. We are indeed in good hands! Thank you everyone who helped RCSA hire exactly the right person despite an accelerated search process.

I am looking forward to the rest of 2018 and beyond as we continue to build upon the foundation of strong Cottrell Scholar and Scialog programs. Basic science and young faculty need our support more than ever right now, and our two programs are both innovative and of high impact. RCSA is part of the national conversation about supporting basic science, and we are making an important difference.

RCSA will continue to develop the science and scientists who are together making a brighter future for all of us.

**Brent L. Iverson**

Incoming RCSA Board Chair

# Awarding Excellence

## Cottrell Plus Awards

Once named as Cottrell Scholars, faculty are welcomed as career-long members of the RCSA family. The Foundation includes Cottrell Scholars at the annual conference, even after their initial appointment and funding has ended; Cottrell Scholars are invited to review applications of future Scholars and to serve on advisory committees; and Cottrell Scholars are eligible for a suite of awards after they have received tenure, awards that are collectively known as “Cottrell Plus.” Through these awards, RCSA aims to support and recognize Cottrell Scholars throughout their careers as science researchers, teachers, and academic leaders.

In 2017, Cottrell SEED (Singular Exceptional Endeavors of Discovery) awards went to **Rainer Grobe** and **Charles Su** (Illinois State University), **Carsten Ullrich** (University of Missouri), **Neepa Maitra** (CUNY/Hunter College), **Keivan Stassun** (Vanderbilt University), and **Duncan Lorimer** (West Virginia University). The 2017 Cottrell FRED (Frontiers in Research Excellence and Discovery, and named in recognition of the founder of RCSA, Fred Cottrell) was awarded to **Sara Skrabalak** (Indiana University). Both awards enable faculty to launch new research projects, either at the idea stage (Cottrell SEED) or at a proof-of-principle stage (Cottrell FRED). Cottrell SEED awards look for out-of-the-box ideas with potentially high impact; risky, interdisciplinary ideas that can be assessed with two years of investigation are especially encouraged, and no preliminary data are required. Cottrell FRED recognizes a creative Cottrell Scholar who is ready to test preliminary research results that hold promise of transformational outcomes.

In 2017, the accomplishments of **Seth Cohen** (University of California, San Diego) and **David Ginger** (University of Washington) as both scientists and teachers were recognized with Cottrell TREE (Transformational Research and Excellence in Education) awards. The 2017 LEAD (Leadership Enrichment and Development) went to **Rory Waterman** (University of Vermont), who aims to improve undergraduate learning through innovation in how teaching is practiced.

## Scialog

In 2017, RCSA held two Scialog meetings to encourage early career faculty to explore fundamental questions at the intersection of physics and biology in the last of three *Molecules Come to Life* conferences, and then across the physical sciences in the first of a new series on *Advanced Energy Storage*. Overall, the three *Molecules Come to Life* Scialogs provided more than \$2 million in funding for 17 interdisciplinary team projects through a partnership with the Gordon and Betty Moore Foundation, and with additional support from the Simons Foundation and the National Cancer Institute. Six research proposals from the first *Advanced Energy Storage* Scialog were funded to launch high-risk/high-reward, collaborative projects, with the Lyda Hill Foundation as a funding partner.

“Both awards enable faculty to launch new research projects, either at the idea stage (Cottrell SEED) or at a proof-of-principle stage (Cottrell FRED).”

## 2017 Cottrell Plus Awardees



Rainer Grobe



Charles Su



Carsten Ullrich

“Overall, the three *Molecules Come to Life* SciLogs provided more than \$2 million in funding for 17 interdisciplinary team projects...”



Neepta Maitra



Keivan Stassun



Duncan Lorimer



Sara Skrabalak



Seth Cohen



David Ginger



Rory Waterman

# Making History

## 2017 Innovators

### David Reitze

*Cottrell Scholar 1996*  
Executive Director of LIGO  
and Research Professor  
of Physics, Caltech

### Vicky Kalogera,

*Cottrell Scholar 2004  
and Scialog facilitator*  
The Daniel Linzer  
Distinguished University  
Professor in Physics &  
Astronomy,  
Northwestern University

### Edo Berger

*Scialog Fellow*  
Professor of Astronomy,  
Harvard University

### Alessandra Corsi

*Scialog Fellow*  
Assistant Professor of  
Astronomy,  
Texas Tech University

### Ryan Foley

*Scialog Fellow*  
Assistant Professor of  
Astrophysics,  
University of  
California-Santa Cruz

### Andy Howell

*Scialog Fellow*  
Staff Scientist,  
Las Cumbres  
Observatory/  
UC-Santa Barbara

### David Sand

*Scialog Fellow*  
Assistant Professor of  
Astronomy,  
University of Arizona

The possibility of detecting gravitational waves from merging black holes or neutron stars by the Laser Interferometer Gravitational-Wave Observatory (LIGO) and then rapidly making corresponding telescope observations of such a merger was an important topic of discussion at RCSA's *Scialog: Time Domain Astrophysics* conferences in 2015 and 2016. In 2017, numerous Scialog Fellows, based in part on collaborations developed at Scialog, made major contributions to the history-making LIGO detection and subsequent astronomical observations of a kilonova—the titanic collision of two neutron stars.

Listed at left are the members of the RCSA Community who participated in the NSF press conference announcing the discovery.

Also in 2017, three exceptional Cottrell Scholars and inorganic chemists received prestigious awards targeted to highly creative scientists:

### Teri Odom *Cottrell Scholar 2005*, Northwestern University

Teri was named a Vannevar Bush Faculty Fellow by the U.S. Department of Defense. The program provides research awards to top-tier researchers from U.S. universities to conduct revolutionary “high-risk, high-payoff” research of strategic importance. Odom’s research project includes designing new classes of metamaterials with multiple length scales, starting on the nanoscale, for unique mechanical, chemical and quantum effects. Odom is Northwestern’s Charles E. and Emma H. Morrison Professor of Chemistry.

### Melanie Sanford *Cottrell Scholar 2006*, University of Michigan, Ann Arbor

Melanie was one of three winners of the very prestigious 2017 Blavatnik Award for Young Scientists. She was celebrated for developing simpler chemical approaches—with less environmental impact—to the synthesis of molecules that have applications ranging from carbon dioxide recycling to drug discovery. Each Blavatnik Laureate receives \$250,000, the largest unrestricted award of its kind for scientists and engineers age 42 and under. Sanford is the University of Michigan’s Moses Gomberg Distinguished University Professor and Arthur F. Thurnau Professor of Chemistry.

### Sara E. Skrabalak *Cottrell Scholar 2012*, Indiana University

In addition to receiving the Cottrell FRED Award, as noted on P. 4, Sara was among a diverse group of 173 scholars, artists and scientists who received Guggenheim Fellowships in 2017. She was chosen from a group of nearly 3,000 applicants. Guggenheim Fellowships are intended for individuals who have already demonstrated exceptional capacity for productive scholarship or exceptional creative ability in the arts.



# 2017 Innovators

“...numerous Scialog Fellows... made major contributions to the history-making LIGO detection and subsequent astronomical observations of a kilonova—the titanic collision of two neutron stars.”



David Reitze



Vicky Kalogera



Edo Berger



Alessandra Corsi



Ryan Foley



Andy Howell



David Sand



Teri Odom



Melanie Sanford



Sara Skrabalak

# RCSA: Supporting Early Career Scientists for More than a Century

While its programs have changed in name and emphasis over the years, Research Corporation for Science Advancement (RCSA) has supported early career scientists for more than a century.

RCSA existed before the word “foundation” was widely used to denote a philanthropy; hence, “corporation.” It existed before the National Science Foundation (NSF) was created. Indeed, Vannevar Bush, generally considered the father of the NSF because of his influential 1945 call for such an organization, was a member of the Research Corporation Board of Directors from 1939-1946.

In the unprecedented prosperity of the post-war decades, the NSF and a number of additional foundations arose to support America’s scientific enterprise. Meanwhile, RCSA continued to focus on helping early career scientists at America’s colleges and universities.

Many young people who contemplated careers in science in the years during and after WWII and into the decades thereafter are now emeriti, although some of the later cohort are still active. We recently talked at length with three who benefited from RCSA support early in their careers: **E. Norval Fortson**, professor emeritus, physics, University of Washington; **Marshall Wilt**, professor emeritus, physics, Centre College; and **Thomas Meade**, the Eileen M. Foell Professor of Cancer Research, as well as the Director of the Center for Advanced Molecular Imaging, and a professor in the Weinberg College of Arts and Sciences and in the Feinberg School of Medicine, all at Northwestern University. Their full stories are posted at <http://rescorp.org/news/profiles>.

As is true today, for all three researchers it took perseverance and focus to establish themselves as academic-based scientists; RCSA support early on helped to validate their chosen directions.

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## A Look Back



Marshall Wilt

“Follow your interests and don’t be stymied by adversity,” said Marshall Wilt. “If you’re a person like I was at an institution that didn’t have a lot of resources and a lot of priority on doing research—that’s changed somewhat, but it was true then—accept that you’re going to have to persevere. You’re going to have to meet disappointment and figure out how to get around it. And to keep the faith—if you have good ideas and you’ve got a good mind, you can succeed. There are institutions like Research Corporation that can assist in making all that happen.”



E. Norval Fortson

E. Norval Fortson’s advice for early career researchers who are getting their first grant from RCSA today is: “Make the most of it. It’s your first chance, when you get it, to have some money. Pick something small, or begin a small part of a larger project that you can finish with the RCSA money. That way you—and others—will see you can succeed.”

Thomas Meade, who has started five companies over the course of his career, advises early career scientists, “If you’re pre-tenure, do not start companies. It’s a distraction. You don’t have time. Hold off. If you’re going to use Research Corporation money to start companies, do it after you have tenure.” He also advises Cottrell Scholars and Scialog Fellows to “aim high and be passionate about discovery.”



Thomas Meade

Wilt, Fortson and Meade also express gratitude to the teachers and colleagues who helped them along the way in many aspects of their careers. For example, Wilt, as do many from his era, fondly remembers RCSA Program Director (later Vice President) Brian Andreen.

“I communicated with him about our first projects. I remember getting maybe a phone call or letter, some kind of communication, saying he was going to be in the area and would like to drop by and see what I was doing and meet me and talk to me. He was genuinely interested in getting at least a basic understanding of what I was doing and why it was interesting and why students would be motivated to participate in it.”

Andreen and many others from RCSA have been there for young academic scientists innumerable times during the past century, caring deeply for their work and the progress they were making in their academic careers. In doing so the people of Research Corporation have helped to foster a sense of community and shared purpose among the members of America’s academic-based science community, despite the many differences among disciplines and institutions.

In 2017 and beyond, RCSA pledges to continue this important mission.

# Scialog Advanced Energy Storage

In 2017 Research Corporation for Science Advancement launched a new Scialog round, on *Advanced Energy Storage*. Scialog's over-arching purpose is to help solve real-world problems of global significance by catalyzing innovative, basic research leading to fundamental discoveries. RCSA's focus is on scientists in the early years of their independent careers. Through the unique Scialog process, we seek to lay the foundation for an ongoing, highly creative, cross-disciplinary community of scientists that will prove adept at identifying exciting areas for research advances.

“Scialog’s over-arching purpose is to help solve real-world problems of global significance by catalyzing innovative, basic research leading to fundamental discoveries.”



From left: Kimberly See, California Institute of Technology; James Neilson, Colorado State University; Brent Melot, University of Southern California



From left: Ekaterina Pomerantseva, Drexel University; Susan Odom, University of Kentucky; Anne Co, The Ohio State University; Kelsey Hatzell, Vanderbilt University

# 2017 Financial Summary

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

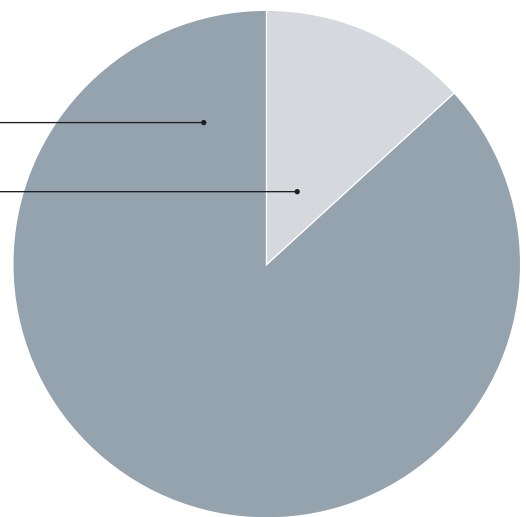
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## Where Our Money Goes

**Total Expenses** \$7.0 million

Program Expenses, Including Grants & Awards **86%**

General & Administrative Costs **14%**



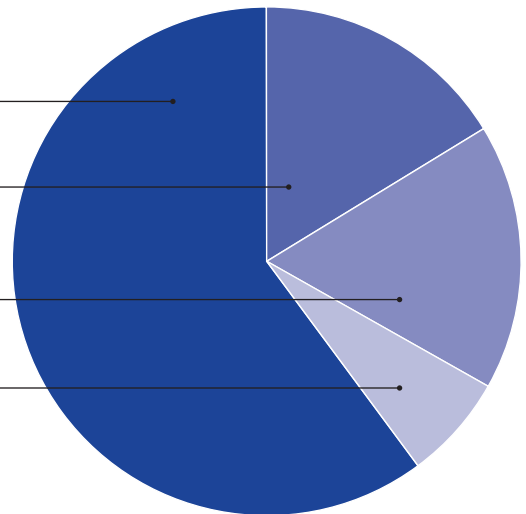
**Grants and Awards** \$4.0 million

Cottrell Scholars Awards **60%**

Scialog Collaborative Awards  
(excludes \$0.8 million in partner awards) **17%**

Cottrell Career Advancement,  
FRED, & Collaborative Awards **17%**

Discretionary Grants & Special Initiatives **6%**



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**Net Assets at Beginning of Year** \$151.9 million

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**Net Assets at End of Year** \$171.8 million

# 2017 RCSA Board of Directors and Officers

**Elizabeth McCormack**

*Chair of the Board*  
Associate Provost,  
Bryn Mawr College

**Dan Linzer**

*President & CEO*

**David Wenner**

*Secretary*  
Retired,  
McKinsey & Company

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**Catherine Murphy**

Professor of Chemistry,  
University of Illinois at  
Urbana-Champaign

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Executive Vice President,  
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Laboratories

**Active Emeriti**

**Stuart Crampton**

**Robert Hallock**

**Robert Holland, Jr.**

**Suzanne Jaffe**

**Gayle Jackson**

**Patrick Osmer**

**John Schaefer**

RCSA provides  
catalytic funding  
for research  
and sponsors  
conferences to  
support:

- Early career faculty
- Innovative ideas  
for basic research
- Integration of  
research and  
science teaching
- Interdisciplinary  
research
- Building the  
academic leadership  
of the future

Tomorrow's science  
will be driven by the courage  
to pursue bold visions.

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