Sustainable Minerals, Metals, and Materials

The Second Annual Scialog Conference
September 10–13, 2025

scialog2025®

ALFRED P. SLOAN FOUNDATION

RESEARCH CORPORATION *for* SCIENCE ADVANCEMENT

THE KAVLI FOUNDATION

Scialog: Sustainable Minerals, Metals and Materials

Objectives

1. Engage in dialogue with the goal of accelerating high-risk, high-reward research.
2. Analyze bottlenecks related to the sustainable use of critical minerals and novel materials, both inorganic and organic. We seek to promote basic science that supports thinking about the entire lifecycle of precious resources. Across this sector we must consider the sustainable acquisition of new resources, minimizing waste throughout design and manufacturing workflows, and planning for the recovery and/or recycling at the end of a material's useful life.
3. Build a creative better-networked community of scientists that crosses disciplinary silos.
4. Form new teams to write proposals to seed novel projects based on innovative ideas that emerge from the dialogue.
5. Most importantly, enjoy the discussions about where this field should go and how we can work together to get there.

Process

Brainstorming is welcome; don't be afraid to say what comes to mind.

Consider the possibility of unorthodox or unusual ideas without immediately dismissing them.

Discuss, build upon and constructively criticize each other's ideas in a spirit of cooperative give and take.

Make comments concise to avoid monopolizing the dialogue.

Conduct at RCSA Meetings

Research Corporation for Science Advancement fosters a welcoming and respectful environment for listening in which the different identities, backgrounds, and perspectives of all participants are valued, and in which everyone is empowered to share ideas as fellow scientists.

RCSA does not tolerate any form of harassment, which could include verbal or physical conduct that has the purpose or effect of substantially interfering with anyone else's participation or performance at this conference, or of creating an intimidating, hostile, or offensive environment; any such harassment may result in dismissal from the conference.

Read RCSA's Code of Conduct

From the President

I'm delighted to welcome you to the **2025 Scialog: Sustainable Minerals, Metals and Materials** meeting, co-sponsored by **Research Corporation for Science Advancement** and the **Alfred P. Sloan Foundation**, with additional support from the **Kavli Foundation**. This is the second in a three-part Scialog series on this vital theme—and the third Scialog we've proudly partnered on with the Sloan Foundation.

The goal of this Scialog is bold and timely: to catalyze fundamental science addressing how we acquire, use, and recycle the critical materials that sustain our high-tech society—from energy to agriculture, from electronics to AI. These resources underpin modern infrastructure, and yet many are vulnerable to supply chain instability or environmental impact. We must consider not only finding alternative materials, but also rethinking extraction, minimizing waste, and ensuring recyclability from the start of a material's life cycle to its end. These are not simple problems—and they will demand **cross-disciplinary collaboration**.

That's the essence of Scialog: to spark innovative thinking and bring together early-career scientists from diverse fields to create high-impact ideas that no one discipline—or individual—could tackle alone. Over the next two days, we hope you'll reconnect with colleagues you may have met last year, and also engage with new voices. The format is designed to help you imagine ambitious projects, question assumptions, and begin forming collaborations that could shape your field for decades to come.

This Scialog series is made possible through the dedicated efforts of Program Directors **Andrew Feig**, **Richard Wiener**, **Eileen Spain**, and **Silvia Ronco** from Research Corporation. We're also grateful for the partnership of **Evan Michelson** and **Isabella Gee** at the Sloan Foundation, and **Jeff Miller** at the Kavli Foundation.

Let me offer just one piece of advice as you enter these discussions: **be bold**. This is your chance to share the idea you've been sitting on, to voice the hunch that doesn't yet have data, to take a leap with a concept that feels a little too risky for traditional venues. We urge you to step outside of incremental work and imagine what might truly change the world.

We hope—and expect—that this second meeting will yield compelling team proposals. It's your job to make our job difficult when it comes to deciding which projects receive funding. But no matter the outcome, we're confident this experience will create lasting collaborations and expand your professional community.

On behalf of all of us at RCSA, I wish you two days of fruitful conversations, breakthrough ideas, and maybe even a bit of scientific serendipity.

Have a terrific meeting.

Eric Issacs
President
Research Corporation for Science Advancement

From the Program Director

Research Corporation's highly interactive Scialog meetings seek to catalyze new collaborations among Scialog Fellows who constitute a highly select group of exemplary early-career scientists from the U.S. and Canada. The emphasis is on dialog, networking, and pursuit of novel, high-risk discovery research based on blue-sky ideas.

Research Corporation, the Alfred P. Sloan Foundation, and the Kavli Foundation chose to focus on Sustainable Minerals, Metals and Materials because we believe modern life thrives on technical innovations that use the novel properties of new materials and polymers. At the same time, however, we must think of the impact these advances have on our environment. We cannot continue to take to scale products for which we lack critical elemental materials required for their synthesis. We cannot continue to take to scale polymeric materials that fail to break down, or that damage fragile ecosystems when they do. We need new basic science that supports how we acquire new sources of critical elements, how we recover and reuse materials at the end of their lifecycles, and how we make polymers that readily revert to natural materials when we no longer need them for their designed function. It will take creativity and imagination to design a future with the sustainability of materials in mind.

We have an outstanding keynote speaker **Eric Schelter** (University of Pennsylvania) to set the stage for breakout discussions. He will be joined by a terrific group of senior scientists to round out the team of facilitators:

Kwame Awuah-Offei (Missouri University of Science and Technology)
Will Dichtel (Northwestern University)
Andrea Hicks (University of Wisconsin – Madison)
Amy Landis (Michigan Technical University)
Ikenna Nlebedim (Ames Laboratory)
Jonathan Wilker (Purdue University)

Scialog meetings focus on dialogue and team building with the goal of creating novel strategies and collaborative approaches. An important feature is the opportunity for Scialog Fellows to form teams and write proposals to pursue particularly creative ideas that emerge through the dialogue. We hope this competition is exciting, but regardless of which proposals are funded, the primary purpose is to catalyze a deeper and more meaningful exchange of ideas than ordinarily occurs at scientific conferences. Our intent is for this process to help participants gain new insights and connections that significantly advance fundamental science to enable major advances in automated laboratory technologies.

We hope each participant finds the Scialog experience of great value. Please do not hesitate to provide feedback on how to make the conference better. My fellow Program Directors, **Richard Wiener, Silvia Ronco**, and **Eileen Spain**, the RCSA staff, and I are here to help make the meeting a great experience!

Andrew Feig
Senior Program Director
Research Corporation for Science Advancement

Conference Agenda
September 10 – 13, 2025

Wednesday, September 10

2:00 pm	**Registration**	Sonoran II Foyer
2:00 – 5:00 pm	**Snacks & Informal Discussions**	Sonoran II Foyer
5:00 – 6:30 pm	**Poster Session and Reception**	Murphey/Murphey Patio
6:00 – 6:30 pm	**Meeting for Discussion Facilitators**	Finger Rock III
6:30 – 7:30 pm	**Dinner**	Murphey/Murphey Patio
7:30 – 8:30 pm	**Welcome** Eric Isaacs, President, RCSA Evan Michelson, Program Director, Sloan Foundation Jeff Miller, Program Director, Kavli Foundation **Conference Overview, Outcomes and Proposal Guidelines** Andrew Feig, Senior Program Director, RCSA **Introductions/Ice Breakers**	Sonoran
8:30 – 11:00 pm	**Starlight Cafe**	Murphey/Murphey Patio

Thursday, September 11

7:00 – 8:00 am	**Breakfast**	Murphey/Murphey Patio
8:00 – 8:45 am	**Keynote Presentation** *Challenges and Opportunities in Critical Metals Separations Chemistry* Eric Schelter, University of Pennsylvania	Sonoran
8:45 – 9:00 am	**Breakout Session Overview and Instructions**	Sonoran
9:00 – 10:15 am	**Breakout Session I**	Sonoran, Rincon, Finger Rock I, II and III
10:15 – 10:35 am	**Report Out**	Sonoran
10:35 – 11:15 am	**Conference Photo and Morning Break**	Sonoran II Foyer
11:15 – 11:45 am	**Mini Breakout Session I** (Fellows) **Facilitator Meeting**	All spaces Sonoran
11:45 – 1:00 pm	**Lunch**	Murphey/Murphey Patio
1:00 – 2:15 pm	**Breakout Session II**	Sonoran, Rincon, Finger Rock I, II and III
2:15 – 2:35 pm	**Report Out**	Sonoran
2:35 – 3:05 pm	**Mini Breakout Session II** (Fellows)	All spaces
3:05 – 5:15 pm	**Afternoon Break, Informal Discussions and Leisure Time**	Sonoran II Foyer
5:15 – 6:30 pm	**Poster Session and Reception**	Murphey/Murphey Patio
6:30 – 7:30 pm	**Dinner**	Murphey/Murphey Patio
7:30 – 8:30 pm	**2024 Team Award Presentations**	Sonoran II Foyer
8:30 – 11:00 pm	**Starlight Café**	Murphey/Murphey Patio

Conference Agenda
September 10 – 13, 2025

Friday, September 12

7:00 – 8:00 am	**Breakfast**	Murphey/Murphey Patio
8:00 – 8:45 am	**2024 Team Award Presentations**	Sonoran
8:45 – 9:15 am	**Mini Breakout Session III** (Fellows)	All spaces
9:15 – 9:45 am	**Morning Break**	Sonoran II Foyer
9:45 – 11:00 am	**Breakout Session III**	Sonoran, Rincon, Finger Rock I, II and III
11:00 – 11:20 am	**Report Out**	Sonoran
11:20 – 11:50 am	**Mini Breakout Session IV** (Fellows)	All spaces
	Facilitator and Funding Partners Discussion	Sonoran
11:50 – 1:00 pm	**Lunch**	Murphey/Murphey Patio
1:00 – 5:45 pm	**Team Formation, Informal Discussions and Proposal Writing**	All spaces
5:45 – 6:30 pm	**Reception**	Murphey/Murphey Patio
6:30 – 7:30 pm	**Dinner**	Murphey/Murphey Patio
7:30 – 11:00 pm	**Starlight Cafe**	Murphey/Murphey Patio

Saturday, September 13

6:30 – 7:30 am	**Breakfast**	Murphey/Murphey Patio
7:30 – 11:00 am	**Presentation of Proposals**	Sonoran
	Assessment Survey and Wrap-up	
10:00 – 12:00 pm	**Lunch** (available to go)	Sonoran II Foyer

Keynote Presentation

Challenges and Opportunities in Critical Metals Separations Chemistry

Eric J. Schelter
University of Pennsylvania

Abstract:
Critical metals represent elements across the periodic table whose properties underpin important applications and are often challenging or impossible to replace. A key exemplar are the rare earth metals (RE = La-Lu, Sc, Y) that are challenging to separate and purify from their primary ores and have important applications in industry such as in permanent magnets, catalysis, and lighting. A key premise in this research area is that the separations chemistry is typically a chokepoint such that new fundamental chemistry can potentially improve separations and relieve criticality. In this talk, I will present some results from my group in recent years on fundamental chemistries of critical metals including Ni/Co and rare earths, applied to challenges in their separations. Our primary means of achieving separations is typically through reactive separations, predicated on understanding differences in electronic structure and bonding of the targets in a mixture, and applying those differences in a selective chemical reaction. As such, kinetic separations have emerged as an important guiding concept to achieve the desired selectivity in a variety of contexts. The opportunities for developing fundamental chemistry towards solutions in applied chemistry problems will also be discussed.

2024 Team Awards

Nicholas Rolston, Electrical, Computer, and Energy Engineering, Arizona State University
Loretta Roberson, Bell Center, Marine Biological Laboratory
Julian West, Chemistry, Rice University
Seaweed for Critical Element Extraction and Transformation (Sea-CrEET)

Helen Zha, Chemical and Biological Engineering, Rensselaer Polytechnic Institute
Loretta Roberson, Bell Center, Marine Biological Laboratory
Jaime Barros-Rios, Plant Science and Technology, University of Missouri
Engineering Plants and Algae as Dye-Free Alternatives to Fossil-Based Textiles

Junsoo Kim, Mechanical Engineering, Northwestern University
Grace Han, Chemistry, Brandeis University
Lucas Bao, Chemistry, Boston College
Synergistic Photomechanical Depolymerization

Nicholas Rolston, Electrical, Computer, and Energy Engineering, Arizona State University
Agnes Thorarinsdottir, Chemistry, University of Rochester
Isabel Barton, Mining & Geological Engineering, University of Arizona
Electrocatalyst Formation from Extracted Critical Trace Elements in Copper Ores (EFFECT ECO)

Jihye Kim, Metallurgical and Materials Engineering, Colorado School of Mines
Shuwen Yue, Chemical Engineering, Cornell University
Qi (Tony) Dong, Chemistry, Purdue University
AI/ML-assisted Separation and Programmable Electrodeposition of Ni and Co

Erika La Plante, Materials Science and Engineering, University of California, Davis
Matthew Nava, Chemistry and Biochemistry, University of California, Los Angeles
Oscar Nordness, Earth and Environmental Engineering, Columbia University
Water-Free Silicate Activation for Valuable Metal Extraction

Helen Zha, Chemical and Biological Engineering, Rensselaer Polytechnic Institute
Julie Rorrer, Chemical Engineering, University of Washington
Co-Developing Advanced Catalysts and Engineered Microbes to Upcycle Mixed, Low-Value Plastic Waste into High-Value Recombinant Products

2025 Proposal Guidelines

1. Awards are intended to provide seed funding for teams of two to three Scialog Fellows formed at this conference for high-risk, high-impact projects.

2. The application package should be submitted as a single PDF file. Pages one and two should describe the project and role of each team member. A third page may be used for references. No budget is necessary.

3. Awards will be in the amount of $60K direct funding per team member, plus a small percentage for overhead. Grant duration will be one year.

4. No Scialog Fellow can be a member of more than two teams. If a Scialog Fellow is a member of two teams, other members of the teams must be different. No team can submit more than one proposal.

5. No Scialog Fellow who previously has won a Scialog: SM3 Collaborative Award can be a member of more than one team. The other team members must be different from the members of the previously awarded team.

6. Scialog Fellows who have previously won two Scialog: SM3 Collaborative Awards are not eligible to be funded members of a team, but they can participate as a non-funded team member.

7. Teams cannot include members who have previously collaborated with one another. If you are unsure of your status (e.g., prospective team members were part of a large collaboration but did not significantly interact), please check for clarification with an RCSA Program Director.

8. Teams are encouraged (but not required) to:
    a. Include members with different research approaches and methods.
    b. Include members from different disciplines.

9. Proposals must be submitted electronically by **6:00 a.m. PST Saturday, September 13, 2025**. Instructions for submission will be provided at the meeting.

10. Awards are anticipated to start **December 1, 2025**.

Scialog Fellows

Brooks Abel brooks.abel@berkeley.edu
Chemistry, University of California, Berkeley
My group develops new polymerization reactions and catalysts for the synthesis of sustainable polymers, primarily by cationic and anionic ring-opening polymerization methods.

Aisulu Aitbekova aitbekova@cmu.edu
Chemical Engineering, Carnegie Mellon University
I develop light- and solar-driven processes that span multiple scales, from nano- to meso- to macro-scales. My goal is to create sustainable and efficient applications in catalysis, separation, and energy conversion by synergistically coupling photo- and thermochemical effects.

Diego Alzate-Sanchez d.alzatesanchez@northeastern.edu
Chemistry and Chemical Biology, Northeastern University
I work in polymer sustainability: Use of polymer ligation as a recycling method, rational use of force in the reprocessing of thermoset, and use of frontal polymerization to fabricate polymeric foams.

Angelina Anani angelinaanani@arizona.edu
Mining and Geological Engineering, University of Arizona
Modeling and optimization of mining systems, mine planning and production scheduling, sustainable mining systems, mine equipment reliability studies, ethnographic research in mining, application of machine learning in mining, mine safety, and dynamic mine planning.

Josh Atkinson joshatkinson@princeton.edu
Civil and Environmental Engineering/Omenn-Darling Bioengineering Institute, Princeton University
My research focuses on using protein engineering and synthetic biology approaches to program electroactive proteins and cells to (1) interface bacteria with electronic devices and (2) control geochemical cycles by altering how electrons flow through microbial ecosystems.

Claudia E. Avalos claudia.avalos@nyu.edu
Chemistry, New York University
I'm interested in the characterization of photoactive materials using magnetic resonance tools to establish structure-function relationships. These materials include perovskites, organic semiconductors and chromophore-radicals applied to solar tech and spin polarization methods.

Junwei Lucas Bao lucas.bao@bc.edu
Chemistry, Boston College
We develop computational methods/theories and AI tools to model electronic structures, kinetics, and dynamics in materials chemistry, catalysis, gas-phase, and interfacial chemistry, with applications in energy storage, photocatalysis, and transition metal-ligand interactions.

Scialog Fellows Continued

Jaime Barros-Rios Jaime.Barros@missouri.edu
Plant Science and Technology, University of Missouri
Plant biology, metabolic and genetic engineering, plant natural products, metabolic pathways, cell wall biosynthesis, cellulose and lignin.

Isabel Barton fay1@arizona.edu
Mining & Geological Engineering, University of Arizona
Geometallurgy; extractive metallurgy; ore deposit geology; history of mining, metallurgy, and geology.

Juliana Carneiro js6441@columbia.edu
Chemical Engineering, Columbia University
Design, synthesis, and characterization of materials for use in electrocatalysis and chemical separation. The research group emphasizes developing electrocatalysts for the electrodes of thermo-electrochemical reactors.

Chris Cooper cbcooper@wustl.edu
Energy, Environmental, and Chemical Engineering, Washington University in St. Louis
Controlling polymer properties by adding dynamic bonds. Reconfigurable electronics and soft robots. Biomimetic design approaches.

Dami Daramola o.daramola@northeastern.edu
Chemical Engineering, Northeastern University
Research interests are geared towards enhancing a circular economy with respect to electrochemically-driven recovery from waste (nutrients from wastewater and rare earth elements from mining waste), polymer upcycling via solvolysis and thermoset composite via carbon integration.

Tony Dong qidong@purdue.edu
Chemistry, Purdue University
Our research focuses on electrified, far-from-equilibrium chemical processes and reactions. Recognizing the severity of global waste issues and resource shortages, we are particularly interested in waste valorization for the green manufacturing of chemicals and materials.

Leora Dresselhaus-Marais leoradm@stanford.edu
Materials Science and Engineering, Stanford University
I use and develop the cutting edge of measurement techniques to learn the fundamental science to enable sustainable manufacturing. Our research explores sustainable & emissions-free metals extraction, the performance of parts, and metal 3D printing to produce efficient components.

Megan Fieser fieser@usc.edu
Chemistry, University of Southern California
My group is interested in homogenous catalysis for the synthesis of degradable polymers and the chemical repurposing of commercial plastic items.

Scialog Fellows Continued

Kara Fong karafong@caltech.edu
Chemical Engineering, California Institute of Technology
My research integrates molecular simulations and theory to study sustainable electrochemical systems for clean energy and water. I seek to answer fundamental questions related to transport and thermodynamics in electrolyte solutions and at electrochemical interfaces.

Victor Fung victorfung@gatech.edu
Computational Science and Engineering, Georgia Institute of Technology
AI/ML for atomistic materials simulations and materials discovery.

Nancy Guo ygnancy@unc.edu
Applied Physical Sciences, University of North Carolina at Chapel Hill
Our group is interested in developing structured polymeric materials for renewable energy management and separation processes by leveraging fundamental principles of chemical engineering, electrochemistry, and materials science.

Grace Han grace_han@ucsb.edu
Chemistry & Biochemistry, University of California, Santa Barbara
My research focuses on designing molecular systems with photoswitchable elements to enable functions such as photon energy storage, controlled heat dissipation, and selective recycling of valuable chemicals to promote energy and environmental sustainability.

Jihye Kim jihyekim@mines.edu
Metallurgical and Materials Engineering, Colorado School of Mines
My research aims to advance the development of efficient and sustainable metallurgical technologies that facilitate the extraction and separation of critical metals.

Junsoo Kim junsoo.kim@northwestern.edu
Mechanical Engineering, Northwestern University
I study the fracture of polymeric materials. Understanding fracture mechanisms will serve as a foundation for synthesizing highly durable polymers, which will curtail polymer pollution and improve the performance of degradable/sustainable polymers.

Erika La Plante eclaplante@ucdavis.edu
Materials Science and Engineering, University of California, Davis
The mineral–fluid interface is host to chemical reactions which influence the properties and behavior in bulk. An understanding of the rates and mechanisms of these processes can be applied to CO2 removal, sustainable infrastructure materials, and extraction of critical metals.

Scialog Fellows Continued

Karl Lang karl.lang@eas.gatech.edu
Earth and Atmospheric Sciences, Georgia Institute of Technology
I am a geologist working in areas of tectonics, geomorphology and sedimentology. My research focuses on methods and applications of geochronology, with an emphasis on radiation damage in minerals.

Nadia Leonard nleonard@ucsb.edu
Chemistry & Biochemistry, University of California, Santa Barbara
My interests are in the design of inorganic molecular complexes and materials with unique physical and catalytic properties for applications in energy storage and conversion, pollutant sensing, and catalysis using light and electricity the main inputs to drive reactivity.

Zhenfei Liu zfliu@wayne.edu
Chemistry, Wayne State University
My research employs interdisciplinary techniques from theoretical/computational chemistry, condensed matter physics, and materials sciences, to understand the electronic structure and dynamics related to interfaces, complex sustainable materials, and energy conversion mechanisms.

Danielle Mai djmai@stanford.edu
Chemical Engineering, Stanford University
We engineer biopolymers, which are the building materials of life. We design stimuli-responsive biomolecules (proteins, nucleic acids) to translate unique functions from biological systems into novel sustainable materials for rare element capture and additive manufacturing.

Tushar Mittal tmittal@psu.edu
Geosciences, Pennsylvania State University
My research focuses on a few major themes: Volcano Science (Modeling magmatic processes); Geofluids & Geomechanics (rock rheology and fluid-rock reactions), as well as energy transition applications - geothermal energy, critical mineral deposit discovery, and geologic hydrogen.

Thandie Moyo tvm5825@psu.edu
Energy and Mineral Engineering, Pennsylvania State University
Hydrometallurgical extraction from low-grade ores, mine waste, waste printed circuit boards and waste batteries. I am also interested in understanding how policy enables/hinders adoption of sustainable practices and circular economy principles in minerals and metals processing.

Matthew Nava mnava@chem.ucla.edu
Chemistry and Biochemistry, University of California, Los Angeles
Interests of my research program include (1) synthetic inorganic and inorganic chemistry (2) energy conversion reactions (3) bioinorganic chemistry (4) small molecule activation (5) photo and electrochemical systems.

Scialog Fellows Continued

Oscar Nordness oan2106@columbia.edu
Earth and Environmental Engineering, Columbia University
I am interested in the development of new processes and materials aimed at reducing the water intensity and environmental impact of mineral/metal recovery from primary sources and current waste streams and enabling the recovery and recycling of these critical materials.

Olumide Ogunmodimu olumide.o@psu.edu
Energy and Mineral Engineering, Pennsylvania State University
My research explores energy systems optimization, comminution & particle technology, and high-energy milling for advanced materials. I also focus on mine tailings repurposing and thermal energy storage from metallurgical waste, promoting sustainability in energy and industry.

Michelle Personick mpersonick@virginia.edu
Chemistry, University of Virginia
I am interested in developing materials-generalizable electrochemical and chemical tools for controlling the facet structure, composition, and surface ligand environment of metal nanoparticles, as well as using these materials to define catalytic structure-function relationships.

Zhe Qiang zhe.qiang@usm.edu
School of Polymer Science and Engineering, University of Southern Mississippi
My research focuses on fundamental science and applied technology development for unleashing the power of plastics and their wastes, enabling their use as a critical material solution for the energy-water-environment nexus toward a sustainable future.

Jeromy Rech jrech@unca.edu
Chemistry and Biochemistry, University of North Carolina at Asheville
Synthesis of conjugated polymers for organic/flexible solar panels. Key areas of focus: simple synthesis, scalability, low cost, recyclability, green solvent processability, and (bio)renewable feedstock for monomers.

Loretta Roberson lroberson@mbl.edu
Bell Center, Marine Biological Laboratory
I am interested in the use of seaweeds to produce alternatives to traditional fossil fuel-based products or practices. For example, in critical element-contaminated areas, seaweeds can enable the integrated bioremediation and harvesting of those elements.

Nick Rolston nicholas.rolston@asu.edu
Electrical, Computer, and Energy Engineering, Arizona State University
My research interests span the areas of renewable energy, materials science, thin-film mechanics, and solid-state physics. Specific areas involve open-air processing of low-cost materials and devices, in-situ reliability characterization, and scalable device manufacturing.

Scialog Fellows Continued

Julie Rorrer jrorrer@uw.edu
Chemical Engineering, University of Washington
Our lab's research is centered on using heterogenous catalysis to enable sustainable chemical transformations including the chemical recycling of plastic waste, storage of clean hydrogen, and the synthesis of biofuels.

Zack Schiffer zschiffer@seas.harvard.edu
Applied Physics, Harvard University
I am an electrochemist specializing in sustainable chemical manufacturing. My lab develops new devices and investigates mechanisms that integrate temperature, light, and voltage to drive chemical reactions, such as those in the nitrogen and carbon cycles.

Hunter Schroer hschroer@mst.edu
Civil, Architectural and Environmental Engineering, Missouri University of Science & Technology
My lab is focused on understanding biological systems to engineer a sustainable future. Practically, we are discovering and engineering enzymes and microbes for water treatment, bioleaching, and other novel biochemistries.

Michael Schulz mdschulz@vt.edu
Chemistry, Virginia Polytechnic Institute and State University
We study the interactions between critical metals and metal-chelating polymers, with a focus on thermodynamics. We also do some work in polyesters, developing bioderived monomers or more recyclable materials.

Udayan Singh usingh@anl.gov
Fuels and Chemicals Group, Argonne National Laboratory
My interests are broadly in the area of sustainability and life-cycle assessment.

Rebecca Smaha rebecca.smaha@nrel.gov
Materials, Chemical, and Computational Sciences, National Renewable Energy Laboratory
I am passionate about designing, synthesizing, and characterizing novel inorganic materials for energy applications including permanent magnets, multiferroics, and microelectronics. I work at the intersection of chemistry, materials science, and condensed matter physics.

Samanvaya Srivastava samsri@ucla.edu
Chemical and Biomolecular Engineering, University of California, Los Angeles
Polymers, soft materials, materials for selective capture.

Xiangcheng Sun xgsche@rit.edu
Chemical Engineering, Rochester Institute of Technology
My research lab investigates catalytic reaction mechanisms and develops efficient catalysts with designed fluorogenic probes, single-molecule spectroscopy and super-resolution imaging techniques. We are interested in visualization of the depolymerization of synthetic polymers.

Scialog Fellows Continued

William Tarpeh wtarpeh@stanford.edu
Chemical Engineering, Stanford University
My group designs selective membranes and adsorbents to enable electrochemical wastewater refining, or the generation of tunable product portfolios from liquid waste streams.

Agnes Thorarinsdottir agnes.thorarinsdottir@rochester.edu
Chemistry, University of Rochester
My group and I seek to apply the tools of synthetic molecular and materials chemistry to the design of new electrochemical systems that address challenges in energy, catalysis, and environmental sustainability.

Thao Tran thao@clemson.edu
Chemistry, Clemson University
My research program aims to develop new quantum materials by tuning their chemical bonding, electronic structure, and behavior, enabling innovative solutions for future information and energy technology.

Josh Worch jworch@vt.edu
Chemistry, Virginia Polytechnic Institute and State University
Polymer synthesis & processing to end-of-life; integrating green chemistry. Materials of interest include dynamic adhesive materials, high-performance composites from native biomass, sustainable resins for additive manufacturing, and recyclable soft electronic materials.

Shuwen Yue shuwen.yue@cornell.edu
Chemical Engineering, Cornell University
Our group focuses on understanding liquid-phase and interfacial phenomena, especially electrolytes and electrochemical systems, from a molecular perspective. We build and apply tools in molecular simulation, machine learning, and statistical mechanics towards these goals.

Helen Zha zhar@rpi.edu
Chemical and Biological Engineering, Rensselaer Polytechnic Institute
My research aims to 1) understand the behavior of biomacromolecules from nano to macro length scales, 2) develop new scalable approaches for synthesizing biobased and bio-inspired materials, and 3) apply those materials towards applications in healthcare and sustainability.

Qiaofu Zhang qzhang60@ua.edu
Metallurgical and Materials Engineering, University of Alabama
ICME(Integrated Computational Materials Engineering) -based design and develop of sustainable materials and manufacturing processes through modeling and rapid experimental prototyping.

Wencai Zhang wencaizhang@vt.edu
Mining and Minerals Engineering, Virginia Polytechnic Institute and State University
Mineral processing, mineral leaching, solvent extraction, direct lithium extraction, etc.

Scialog Fellows Continued

Micah Ziegler micah.ziegler@gatech.edu
School of Chemical and Biomolecular Engineering; School of Public Policy, Georgia Institute of Technology
I evaluate energy and chemical technologies, their impact, and their potential. With data and models, I aim to help researchers, policymakers, and investors accelerate the improvement and deployment of technologies to enable a transition to sustainable and equitable systems.

Michael Zuerch mwz@berkeley.edu
Chemistry, University of California, Berkeley
Experimental investigation of structure and dynamics of complex, correlated solid-state materials: Specific areas if interest are the observation and control of: Collective phenomena, and Chemical material dynamics at surfaces and interfaces.

Discussion Facilitators

Kwame Awuah-Offei kwamea@mst.edu
Mining & Explosives Engineering, Missouri University of Science & Technology
My research focuses on criticality assessment and developing sustainable mining and processing techniques. My research interests include critical minerals, sustainability (including LCA), and human factors (human-centered design).

Will Dichtel wdichtel@northwestern.edu
Chemistry, Northwestern University
Polymer chemistry, two-dimensional polymerization, polymer recycling and reprocessing, physical organic chemistry.

Andrea Hicks hicks5@wisc.edu
Civil and Environmental Engineering, University of Wisconsin - Madison
Environmental impacts and sustainability implications of emerging technology. In particular also including the role of human behavior and its sustainability implications.

Amy Landis landis@mtu.edu
Graduate & Online Education, Michigan Technology University
I have 20 years experience in research on bioplastics, plastic sustainability, renewable energy and materials, life cycle assessment, material flow analysis. She also has nearly a decade of administrative experience leading diversity, equity, and inclusion.

Ikenna Nlebedim nlebedim@iastate.edu
Division of Critical Materials, Ames National Laboratory
I specialize in critical materials research, focusing on rare earth elements (REEs) metal production, permanent magnet fabrication and systems-level modeling/prototyping. My work also includes developing innovative recycling processes for REEs and battery materials.

Eric Schelter schelter@sas.upenn.edu
Chemistry, University of Pennsylvania
New methodologies in sustainable, critical metals separations and recycling

Jon Wilker wilker@purdue.edu
Chemistry, Purdue University
Biomimetic chemistry from sea creatures to develop sustainable materials including adhesives.

Guest

Isabella Gee gee@sloan.org
Energy and Environment Program, Alfred P. Sloan Foundation
To inform the societal transition to low-carbon energy systems in the United States

Ruoming Gong ruoming.gong@northwestern.edu
Applied Math, Northwestern University
I am working on conversation dynamics and interested in the team science and how people communicate with each other.

Emily Jack-Scott ejs@agci.org
Workshops, Aspen Global Change Institute
My research interests extend across global change science (including food systems, decarbonization pathways, artificial intelligence, land use, and more). I am especially interested in how to leverage interdisciplinary networks to bridge actionable science and decision-making.

Adam Jones adam.jones@moore.org
Science, Gordon and Betty Moore Foundation
Moore Foundation Science Program Officer working on the foundation's new green chemistry initiative.

Sue Merrilees smerrilees@sciphil.org
Advising/Membership Team, Science Philanthropy Alliance
Basic science philanthropy, including life sciences, physical sciences and mathematics. Understanding the motivation behind UHNWI's giving.

Evan Michelson michelson@sloan.org
Energy and Environment Program, Alfred P. Sloan Foundation
I am responsible for overseeing the Foundation's Energy and Environment program to inform the transition toward low-carbon energy systems in the United States by investigating economic, environmental, technological, and distributional issues.

Jeffrey Miller jmiller@kavlifoundation.org
Nanoscience, The Kavli Foundation
Nanoscience, sustainability, and quantum materials.

Alfred P. Sloan Foundation

Evan Michelson michelson@sloan.org
Program Director, Energy and Environment Program

Isabella Gee gee@sloan.org
Program Associate, Energy and Environment Program

The Kavli Foundation

Jeffrey Miller jmiller@kavlifoundation.org
Science Program Officer, Nanoscience

Research Corporation for Science Advancement

Jennifer Brown jbrown@rescorp.org
Director of Finance and Human Resources

Andrew Feig afeig@rescorp.org
Senior Program Director

Danny Gasch dgasch@rescorp.org
Chief Financial Officer

Suzette Gonzalez sgonzalez@rescorp.org
Program & Award Administrator

Angela Hagen ahagen@rescorp.org
Communications Director

Eric Isaacs eisaacs@rescorp.org
President

Meg Zimlich Martin mmartin@rescorp.org
Director of Program & Award Administration

Aileen Quezada aquezada@rescorp.org
Program & Award Administrator, Senior

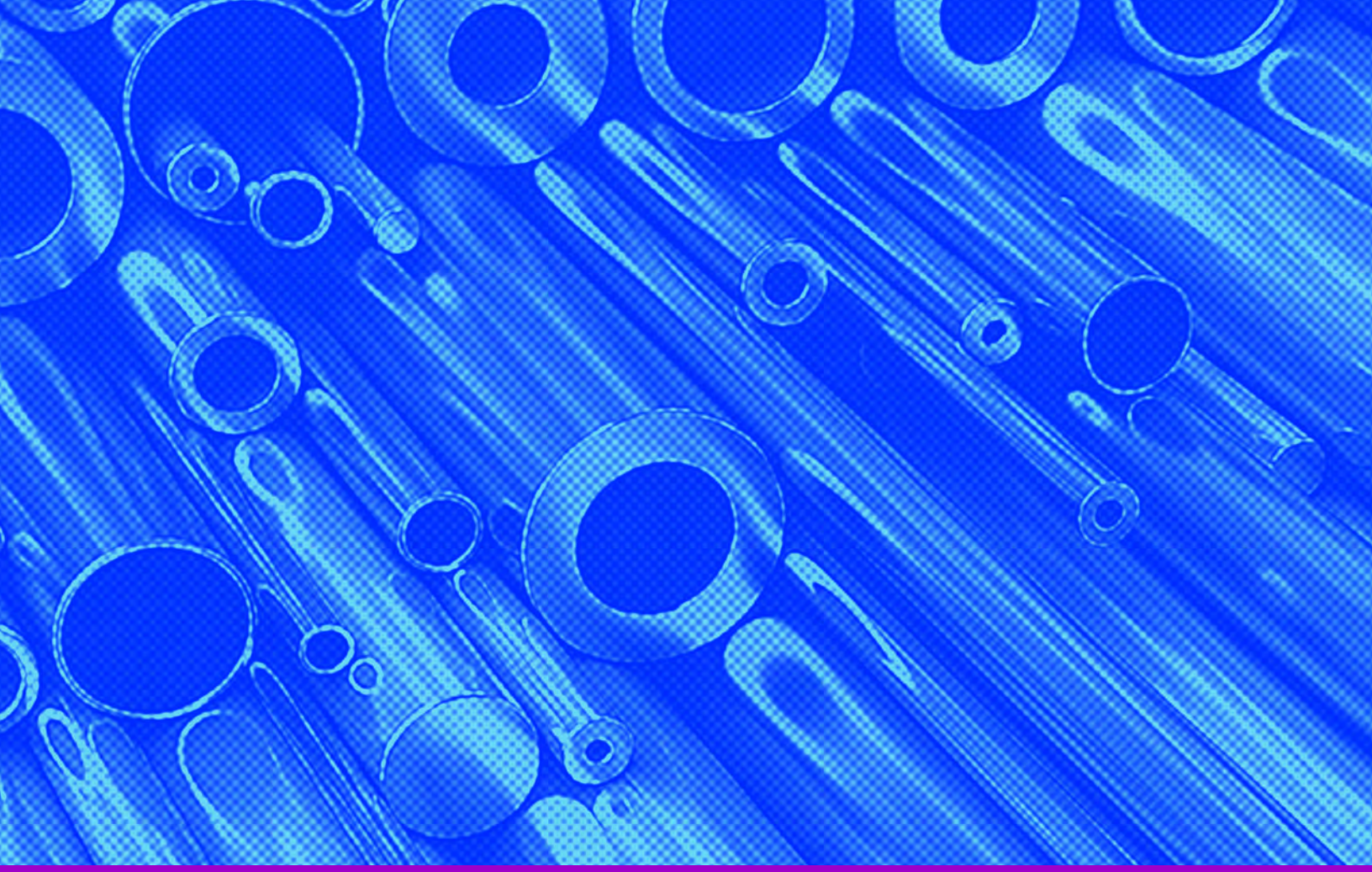
Silvia Ronco sronco@rescorp.org
Senior Program Director

Abhishek Shivaram ashivaram@rescorp.org
Data Analytics Specialist

Eileen Spain espain@rescorp.org
Program Director

Richard Wiener rwiener@rescorp.org
Senior Program Director

Randi Jo Willmeng rjwillmeng@rescorp.org
Executive Assistant to the President



4703 East Camp Lowell Dr.
Suite 201
Tucson, Arizona 85712
rescorp.org

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