Welcome! Please answer the following question in the chat box:

What has been the hardest part of applying to the SCGSR program so far?

Office of Science Graduate Student Research Program (SCGSR)

Application Assistance Workshop 2 for 2025 Solicitation 2

October 9, 2025

"This has been the most productive year of my PhD."

SCGSR 2023 S2 Awardee

U.S. DEPARTMENT of ENERGY | Office of Science

Energy.gov/science

Schedule

(All times East)

2:00-2:50 PM Webinar:

- The SCGSR Program
- Evaluation of the Applications
- Proposal format
- Tips on Proposal Writing
- Q&A

3:00-3:30 PM **Panel I: Recent SCGSR Awardees** (2 parallel panels)

3:30-4:00 PM **Panel II: DOE National Lab Scientists** (2 parallel panels)

SCGSR Program

Support advanced workforce development in areas critically important to SC mission

Supplemental funding to **PhD candidates** for conducting part of their **thesis research at DOE National Laboratories**

3 – 12 months in collaboration with a DOE National Laboratory scientist

- U.S. citizens or Lawful Permanent Residents
- Alignment with priority research areas (7 SC program offices)
- New research experiences (no prior experience at the host lab), BES: proximity restrictions

Scientist in Residence
Build network and **establish yourself in the field**

Stipend: Up to $3,600/month
Travel Reimbursement: Up to $2,000

SCGSR Program by the Numbers

"The SCGSR program has been the most valuable part of my graduate education."

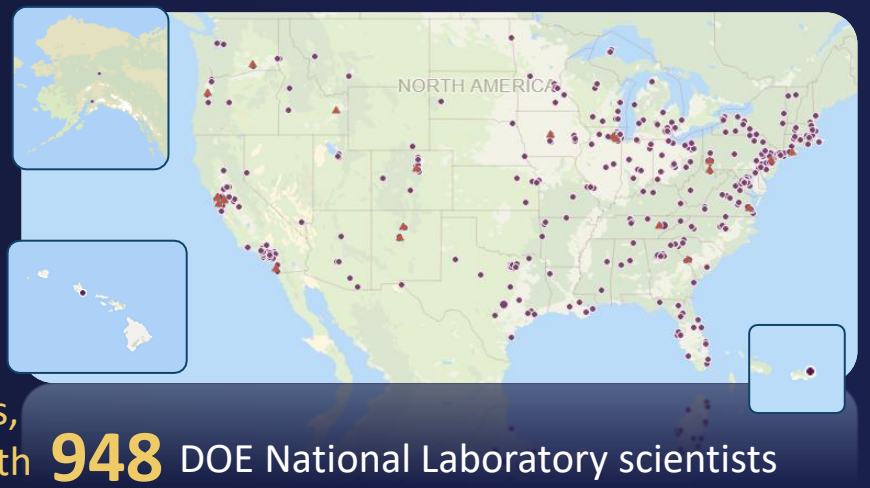
SCGSR 2022 S2 Awardee

Since **2014**

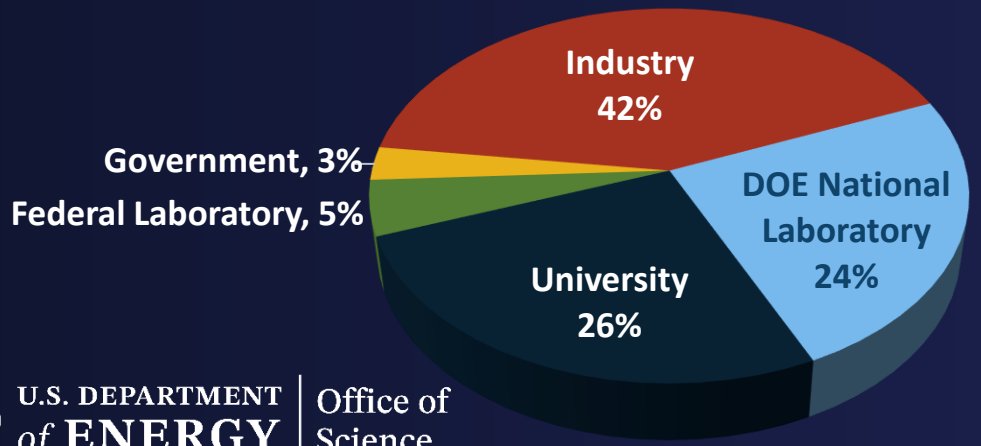
1363 awardees from

540 hometowns in

48 States + DC + Puerto Rico, pursuing PhDs at **173** Universities, working with **948** DOE National Laboratory scientists



SCGSR Alumni Work in…



>900 Research articles

>30,000 Citations

>800 Research presentations

>100 International Presentations

10 Patents

What Awardees Say About SCGSR

99% Received training not available at their universities

99% **Expanded their networks**

99% SCGSR introduced them to careers outside academia

100% **Their SCGSR award led to completion of a key part of their PhD dissertation**

U.S. DEPARTMENT of ENERGY | Office of Science

Energy.gov/science

SCGSR Program Management

U.S. Department of Energy (DOE), Office of Science (SC)

- **Dr. Igor I. Slowing**
  SCGSR Program Manager
  Office of Workforce Development
  for Teachers and Scientists (WDTS)

U.S. DEPARTMENT of ENERGY | Office of Science

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- **Dr. Megan M. Morris**
  Associate Manager
  STEM Workforce Development
- **Abby Robbins**
  Program Specialist
  Workforce Development

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

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Types of Research that the SCGSR Program Supports

- **Hypothesis driven research**: Fundamental research (NOT applied research).

  https://science.osti.gov/wdts/scgsr/How-to-Apply/Priority-SC-Research-Areas

- **Method or instrument development**: when aimed to enable fundamental research, or if it is part of a large fundamental science experiment.

57 SC Research Priority Areas

Advanced Scientific Computing Research (ASCR)	World leading computational and networking capabilities
Biological and Environmental Research (BER)	Understand complex biological, earth, and environmental systems
Basic Energy Sciences (BES)	Understand, predict, and control matter and energy at the ele[illegible]onic, atomic, and molecular levels
Isotope R&D and Production (DOE IP)	National preparedness for isotope production and distri[illegible]on
Fusion Energy Sciences (FES)	Build the scientific foundations for a fusion energy [illegible]rce
High Energy Physics (HEP)	Understand how the universe works at its most fundam[illegible]tal level
Nuclear Physics (NP)	Discover, explore, and understand all forms of nuclear matter

Convergence Areas

Exclusions!

The SCGSR Program Supports

PhD candidates who…

1) …propose research relevant to SC Priority Areas
https://science.osti.gov/wdts/scgsr/How-to-Apply/Priority-SC-Research-Areas

2) …need tools and/or expertise that are not available at their Universities

Unique expertise/capabilities of scientists/facilities at DOE National Labs/Facilities

⇨ **take your PhD research to the next level**

SCGSR is ON SITE at the host DOE National Laboratory!!!

SCGSR Proposal

1. Overall Goal:

Overarching problem or question? **THE BIG PICTURE!**

2. Background:

Current understanding/state of the art? **UP TO DATE!**
Relevance? **THE BIG PICTURE!**
Fit in an SCGSR priority research area?
Broadly: how can this problem/question be answered? **GENERAL STRATEGY**
Preliminary results/data suggesting your idea may work? **CREDIBILITY**

3. Specific aims:

Basis for your research plan. Split Goal into smaller targets.

4. Approach:

Strategy, general steps with rationale. Will you use the best methods there are?
What will you be doing in the lab from day 1? **SPECIFICS**
What results do you expect? The impact of your work.
Potential problems? **PREPAREDNESS**

5. Timeline:

Expected pace of progress? **BUILD IN TIME FOR TRAININGS!**

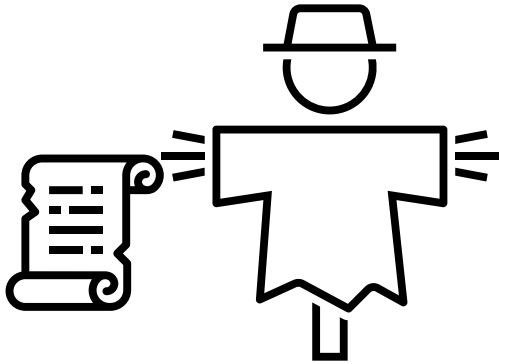
3 pages

6. References:

Separate **1** page.

USE IT!

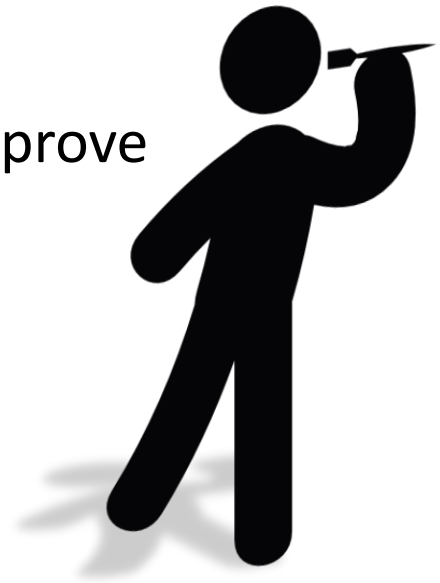
A Straw Man Proposal



A quick draft for brainstorming

- Start with bullets
- Include all ideas: good and bad

  -> then you can trim and improve
- Beef the surviving bullets up
- Connect the bullets



Help your Reviewers:

Wording Typical of Key Elements

The *aim* of my research is to develop *the scientific basis* for…..
This work will deepen the *fundamental understanding of* ….

Goal

XXX is one of the most promising approaches for ….(REF) However, it is not well *understood* the *mechanism* of how XXX….

Background/ Rationale

We have observed that… and… (REF). *Our results suggest* that YYY…

Credibility/ Hypothesis

To determine the potential *role* of YYY on *the mechanism* of XXX… we *propose* to…

Overall strategy

ZZZ at AAA *National laboratory* has developed …*tools* that are ideally suited to text our hypothesis.

SCGSR

Therefore, we propose to *collaborate* with AAA to…. **SCGSR**

We will *first*… *this will determine* whether…. **Steps along with rationale**

Based on the outcomes of… , *we will* either… or …. **Expectations/Strategy**

It is *possible* that…, in this case we will… **Contingency plans**

Ultimately, we *expect* to… **Expected results**

Reaching this understanding *addresses the grand challenge* listed in the report… (REF or link). **Overall goal – Relevance to SC Mission/Impact – Vision**

Aligning Proposal to SC Mission/SCGSR Priority Research Areas

https://science.osti.gov/wdts/scgsr/How-to-Apply/Priority-SC-Research-Areas

Program office's websites:

- Basic research needs reports ➡ grand challenges: does your research aim that way?
- PI meeting/workshop reports for some of their divisions ➡ find potential collaborating scientists

Find them along with many other document types at:

- ASCR: https://science.osti.gov/ascr/Community-Resources
- BER: https://science.osti.gov/ber/Community-Resources
- BES: https://sc.osti.gov/bes/Community-Resources
- DOE IP: https://sc.osti.gov/Isotope-Research-Development-and-Production/Resources
- FES: https://sc.osti.gov/fes/Community-Resources
- HEP: https://sc.osti.gov/hep/Community-Resources
- NP: https://sc.osti.gov/np/Community-Resources

EXERCISE: 3 minutes

Write down your overall research goals in 2-3 sentences

1. Start rough, polish later

2. Clear and concise sentences

3. Avoid being wordy

4. Try to show the expected impact

EXERCISE: 3 minutes

List 5 tools, methods, and/or techniques* that you would need to reach your research goals

*Not available at your home university

Explain briefly:

- Why do you need them?
- How would you use them?

Homework: which DOE National Lab has them?

Proposal Review Criteria

1. Scientific and/or Technical Merit of the Proposed Research (Score 1 – 6)
a. Is the proposed research **well-conceived**, and does it demonstrate a **clear understanding** of the scientific and technical challenges involved? b. Is the proposed **method and approach** for the proposed research appropriate? c. Is the applicant **sufficiently prepared** to conduct the proposed research? d. Are the DOE laboratory **resources** adequate? If applicable, has the necessary access to a scientific user facility been secured?
2. Relevance of the Proposed Research to Graduate Thesis Research and Training (Score 1 – 4)
a. Does the proposed research have the potential to make a **significant contribution to the applicant's PhD thesis** research project? b. Will the proposed research enhance the applicant's **training and research skills**?

EXERCISE: Homework

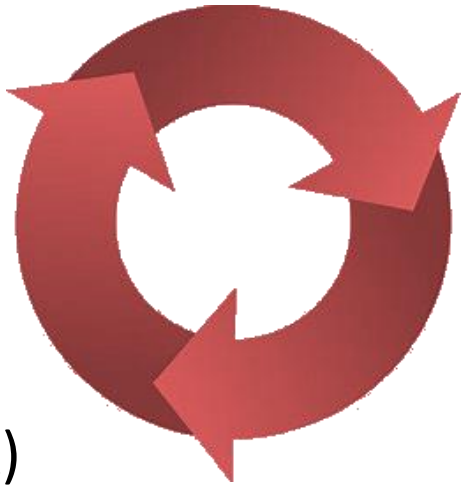
Grab Your Proposal Draft and Assess it Based on the Review Criteria

Even better… ask a friend to do it for you
(just don't get mad about criticisms)

Check flow:

- **Logic of the ideas**: How articulate and complete is the reasoning? Are there any gaps?
- **Readability**: Can they understand what you meant to say?

Rate each item of the criteria on a 1 – 4 scale
(yes… that is arbitrary, but gives you an idea of what needs more work)



Write-Feedback-Write

Top 10 Concerns of Past Reviewers

1. Lack of **detail** or specificity in the research plan/goals/methodologies/outcomes. (~30%)
2. Overly **ambitious scope** for the timeline/scope **too broad**. (~20%)
3. Inadequate **preliminary data**/prior experience. (~15%)
4. Insufficient **discussion of challenges**/limitations of proposed methods/**risk mitigation** strategies. (~15%)
5. Unclear connection to **thesis/training** enhancement. (~12%)
6. Lack of **novelty**/broader scientific **impact**/connection to **DOE mission**. (~10%)
7. Lack of clear **scientific hypothesis**. (~10%)
8. Insufficient justification for DOE **national lab resources**/fit. (~10%)
9. Proposal **writing**/**clarity**/grammar issues. (~10%)
10. Insufficient consideration of alternative methods/**comparison to other methods**/questionable **appropriateness** of technique/method. (~10%)

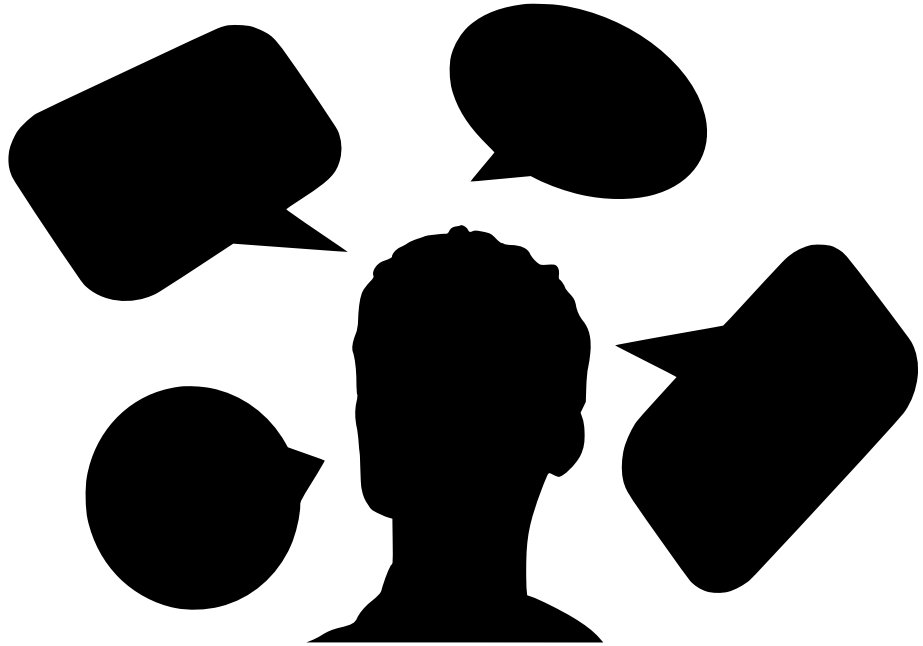
Keep in Mind

Reviewers are…

Smart: they won't fall for attempts to embellish an idea or cover some deficiency – be honest and go straight to the point

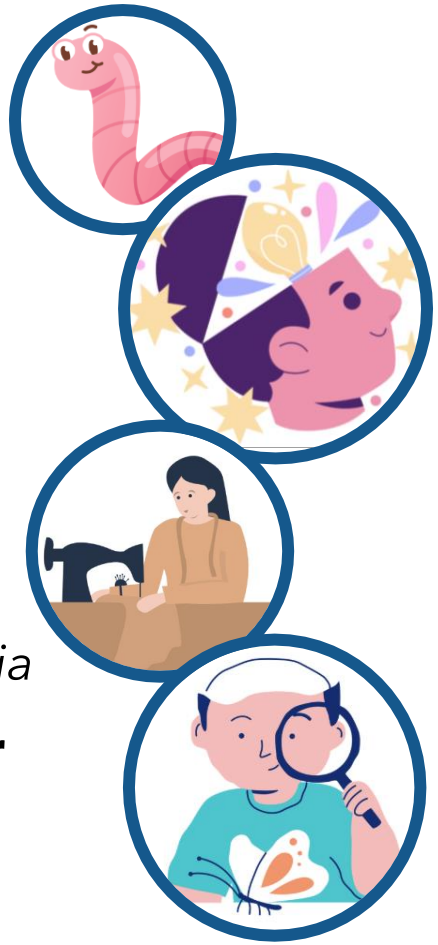
Busy: don't make them lose time with items that aren't needed

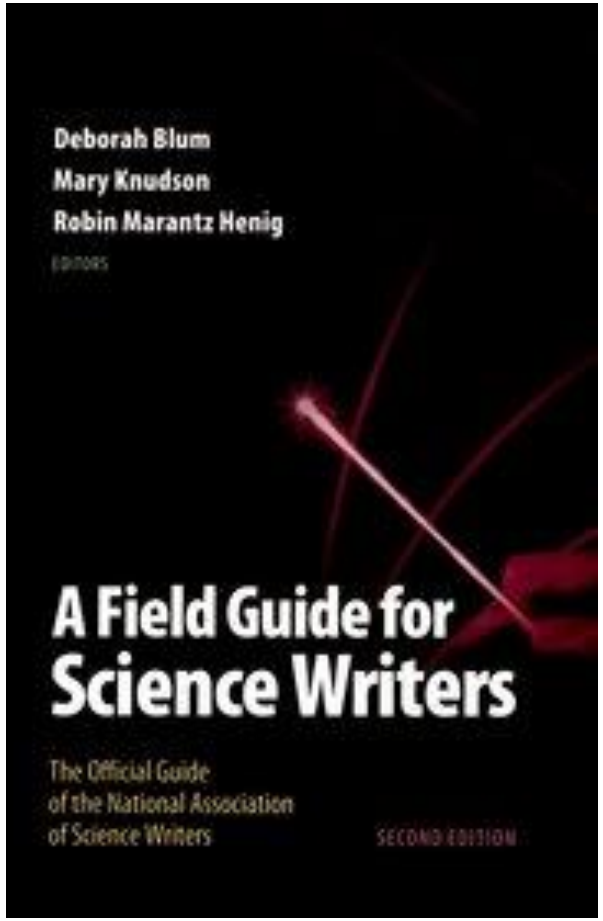
Multitasking: short sentences go a longer way



Crafting an engaging narrative

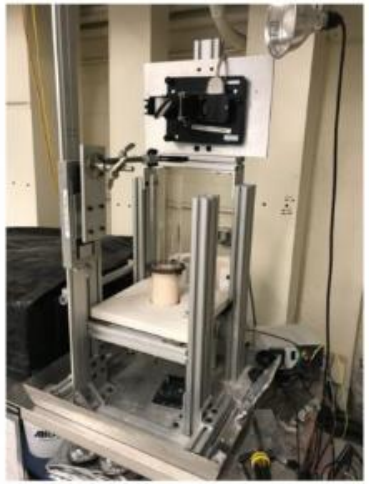
1. **Learn the Craft**
   - Make complex ideas accessible yet accurate
   - ➢ *Be mindful of "click-bait" pitfalls*
2. **Hone Your Skills**
   - Practice and refine
   - ➢ *Creativity blossoms in times of quiet reflection*
3. **Choose Your Market**
   - Be mindful of format
   - ➢ *Tailor your proposal to align with SCGSR criteria*
4. **Your Responsibility as a Science Writer**
   - Ethics, sources
   - ➢ *Be curious, skeptical, and rigorous*

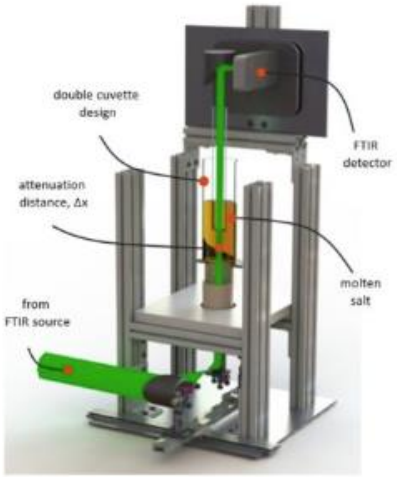




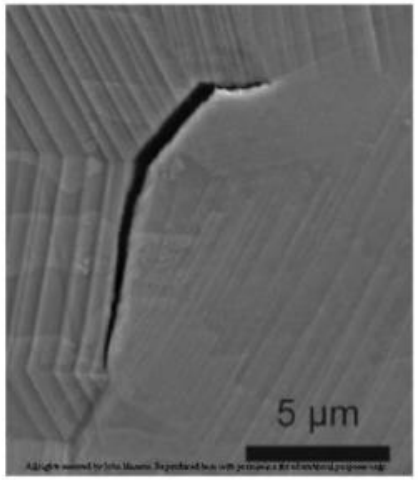
The art of illustrating complex concepts

- Start with a plan – what do you want to convey?





Diagrams and illustrations

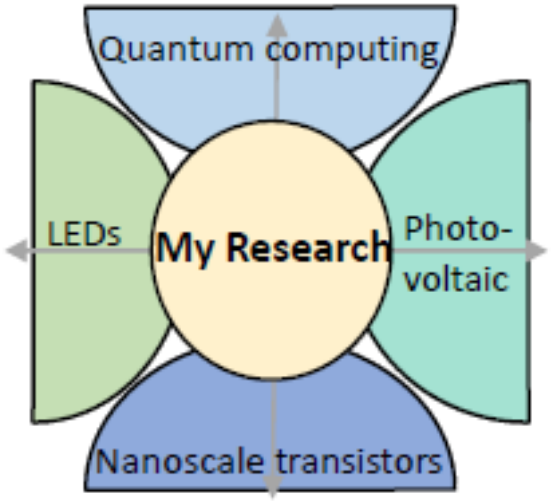


Schematics

MIT Nuclear Science & Engineering Communication Lab: https://mitcommlab.mit.edu/nse/commkit/figure-design/

Remember: A Picture* is Worth a Thousand Words

*Or a graphic, or a diagram, or a plot, or a table…



Timeline

Activity	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Develop 2D model for bacteria-substrate-infiltration interactions												
Extract metrics from 2D model												
Extend the 2D numerical model to the [redacted] river												
Develop simulation-based model for predicting bioclogging												
Quantify feedback effects on clogging												

Questions So Far?

Panels with 2024 S2 SCGSR Awardees

Panel 1:

- **Eric Melin** – ORNL – *Advanced Computing Technologies:* Self-admitted technical debt in scientific software
- **Alyson Plaman** – LANL – *Radiochemical Separations:* Coordination and electronic properties of actinide ions
- **Steven Akwabli** – SNL – *Microelectronics:* In-gap defect states in semiconductors

Panel 2:

- **Carina Baker** – ANL – *High Energy Physics:* Detection of cosmic microwave background interferents
- **Maci Kesler** – NP – *Heavy Ion Nuclear Physics:* Imaging of nuclei in electron-ion collisions
- **Rachel Hammer** – LLNL – *Plant Science for Bioenergy*: Fungal root symbionts in bioenergy production
- **Nathan Wong** – PNNL – *Computational Chemistry:* Atomistic modeling of electron bifurcation proteins

Panels with National Laboratory Scientists

Panel 1:

- **Dr. Alex Martinson** – ANL – Interfaces, *in situ* characterization of materials synthesis
- **Dr. Silvia Zorzetti** – FNAL – Quantum computing, quantum transduction, quantum communication
- **Dr. Dustin McIntyre** – NETL – Optical sensing methods in harsh environments
- **Dr. Ping Yang** – LANL – Accelerating f-element separation with machine learning

Panel 2:

- **Dr. Maria Chan** – ANL – Nanoscience, first principles and AI/ML approaches for materials property prediction
- **Dr. Dmitry Polyansky** – BNL – Photochemistry, artificial photosynthesis, ultrafast transient spectroscopy
- **Dr. Gary Trubl** – LLNL – Meta-omics, microbial ecology, soil microbiology, biogeochemistry
- **Dr. Alexander Austregesilo** – TJNAF – Hadron Physics, GlueX, hybrid meson searches
- **Dr. Eugene Dumitrescu** – ORNL – Quantum physics, quantum information science

Panel 3:

- **Dr. Anh Pham** – LLNL – Multiscale simulations and data science for property prediction, high performance computing
- **Dr. Hou-Tong Chen** – LANL – Terahertz science and technology, metamaterials and metasurfaces, nanophotonics, scanning terahertz and infrared microscopy
- **Dr. Grant Johnson** – PNNL – Separation science, interfaces, molecular qubits, nanoscience
- **Dr. Leah Broussard** – ORNL – Neutron physics, neutron decay

Thank You!