

U.S. Department of Energy  
**OFFICE OF SCIENCE**

Office of **SC**ience **GR**aduate **ST**udent **R**esearch  
(**SCGSR**) Program

Application Assistance Workshop 2  
for 2024 Solicitation 1

*April 18, 2024*

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

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



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# SCGSR Program Management Team

## 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)

Email:

[Igor.Slowing@science.doe.gov](mailto:Igor.Slowing@science.doe.gov)  
[SC.scgsr@science.doe.gov](mailto:SC.scgsr@science.doe.gov)

## Oak Ridge Institute for Science and Education (ORISE)

- Dr. Maria Taydem  
Project Manager  
Workforce Development
- Abby Robbins  
Program Specialist  
Workforce Development

Email:

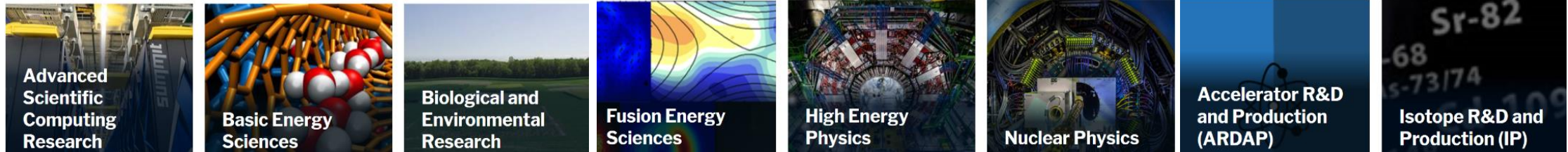
[DOE-scgsr@ornl.gov](mailto:DOE-scgsr@ornl.gov)

# SCGSR Program Involves Multiple Institutions

The SCGSR program is sponsored and managed by



In collaboration with the SC Program Offices of



and the US DOE National Laboratories/Sites



Online application and awards administration by



# Schedule (All times East)

- 2:00-2:50 PM Webinar:  
Evaluation of the Applications  
Proposal format  
Tips on Proposal Writing  
**Q&A**
- 2:50-3:00 PM Migrate to Gather.Town, create avatar and move to panel rooms
- 3:00-3:30 PM **Panel I: Recent SCGSR Awardees** (2 parallel panels)
- 3:30-4:00 PM **Panel II: DOE National Lab Scientists** (4 parallel panels)
- 4:00-4:30 PM Individual discussions with panelists and other scientists throughout the Gather.Town spaces, walk around talk to whoever you want, please fill feedback questionnaire at lobby

# SCGSR Supports PhD Students whose Research...

- Advances our fundamental understanding of nature
- Develops tools or methodologies that enable scientific discovery



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Home | Programs | Workforce Development for Teachers and Scientists (WDTs) | Office of Science Graduate Student Research (SCGSR) Program | SCGSR Awards and Publications

### SCGSR Awards and Publications

Awards from Past SCGSR Solicitations

Eligibility

Benefits

Participant Obligations

How to Apply

Information for Laboratory Scientists and Thesis Advisors

Key Dates

Frequently Asked Questions

Reporting Harassment or Discrimination

Contact

### Contact DOE Office of Science Graduate Student Research Program

Address  
U.S. Department of Energy  
SC-331 Forrestal Building  
1000 Independence Ave., SW  
Washington, DC 20585

### SCGSR Publications

Publication Year: 2023 | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016

#### 2023

- JoAnn Ballor** (SCGSR 2017 S2/BES/PNNL)  
Arun Devaraj  
A review of the metastable omega phase in beta titanium alloys: the phase transformation mechanisms and its effect on mechanical properties  
*Int. Mater. Rev.* **2023**, *68*, 26  
<https://doi.org/10.1080/09506608.2022.2036401>
- Anthony Yoshimura** (SCGSR 2018 S2/BES/ORNL)  
Bobby Sumpter  
Quantum theory of electronic excitation and sputtering by transmission electron microscopy  
*Nanoscale* **2023**, *15*, 1053  
<https://doi.org/10.1039/D2NR01018F>
- Cindy Zheng** (SCGSR 2020 S2/BES/ANL)  
Byeongdu Lee  
Arrays of Colloidal Single Crystals Engineered with DNA in Lithographically Defined Microwells  
*Nano Lett.* **2023**, *23*, 116  
<https://doi.org/10.1021/acs.nanolett.2c03713>
- Ingrid Paredes** (SCGSR 2018 S2/BES/BNL)  
Anatoly Frenkel  
Synthesis and elucidation of local structure in phase-controlled colloidal tin phosphide nanocrystals from aminophosphines  
*Mater. Adv.* **2023**, *4*, 171  
<https://doi.org/10.1039/D2MA00010E>
- Gautam Gunjala** (SCGSR 2020 S2/BES/LBNL)  
Kenneth Goldberg  
Data-driven modeling and control of an X-ray bimorph adaptive mirror  
*J. Synchrotron Rad.* **2023**, *30*, 57  
<https://doi.org/10.1107/S1600577522011080>
- Michelle Devoe** (SCGSR 2021 S2/BES/LBNL)  
Nobumichi Tamura  
Residual strain orientation in rolled titanium determined with synchrotron X-ray Laue microdiffraction  
*J. Appl. Cryst.* **2023**, *56*, 135  
<https://doi.org/10.1107/S1600576722011311>
- Kevin Carter-Fenk** (SCGSR 2018 S2/BES/PNNL)  
Christopher Mundy  
Birth of the Hydrated Electron via Charge-Transfer-to-Solvent Excitation of Aqueous Iodide  
*J. Phys. Chem. Lett.* **2023**, *14*, 870  
<https://doi.org/10.1021/acs.jpcllett.2c03460>
- David Gardner** (SCGSR 2018 S2/BES/LBNL)  
Martin Kunz  
Uniaxial stress increases layer stacking disorder in calcium silicate hydrates with low calcium content

<https://science.osti.gov/wdts/scgsr/SCGSR-Awards-and-Publications>

# ~50 SCGSR Research Priority Areas

## Accelerator R&D and Production (ARDAP)

New accelerator technologies for SC's scientific facilities and commercial products

## Advanced Scientific Computing Research (ASCR)

Mathematics, Computer and Computational Sciences, etc.

## Biological and Environmental Research (BER)

Biology (non-medical), bioinformatics, environmental science, plant science, microbiology, atmospheric science, earth systems modeling, etc.

## Basic Energy Sciences (BES)

Chemistry, Materials Science, Geosciences, Chemical Physics

## Isotope R&D and Production (DOE IP)

Separations, radiochemicals, imaging, enrichment, etc.

## Fusion Energy Sciences (FES)

Plasma physics, magnetic confinement fusion, energy dynamics, etc.

## High Energy Physics (HEP)

Theory, experiment, accelerator and detector technologies, etc.

## Nuclear Physics (NP)

Theory, fundamental symmetries, QIS, AI, accelerator and detector technologies, etc.

**Convergence Areas**  
**Exclusions!**

# SCGSR Supports PhD Students whose Research...

Needs advanced/unique instrumentation and/or expertise available at  
US DOE National Laboratories



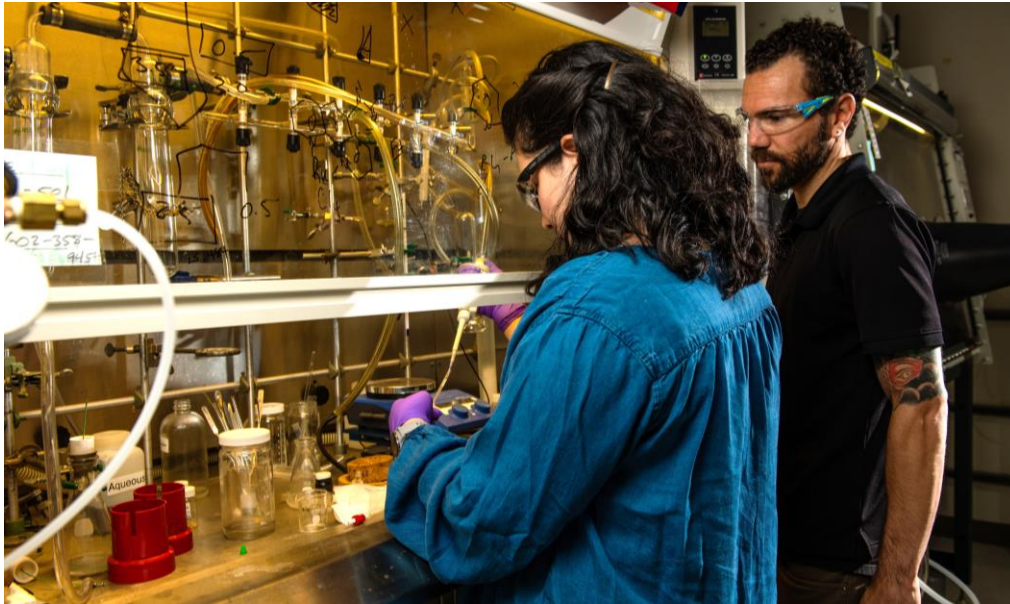
<https://www.energy.gov/national-laboratories>

<https://science.osti.gov/User-Facilities/User-Facilities-at-a-Glance>

# Finding a Collaborating Scientist

Literature • Network • Labs Websites • SCGSR Website

<https://science.osti.gov/wdts/scgsr/How-to-Apply/Identifying-a-Collaborating-DOE-Laboratory-Scientist/View-Potential-Collaborating-Scientists>



[SC.SCGR@science.doe.gov](mailto:SC.SCGR@science.doe.gov)

Today's advice:

- SCGSR awardees panel (3:00-3:30 PM)
- National lab scientists panel (3:30-4:00 PM)
- Informal conversation time (4:00-4:30 PM)

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### View Potential Collaborating Scientists

**DOE National Laboratory Scientists with Interest in Collaborating with SCGSR Awardees**

**Susannah Burrows - [Susannah.Burrows@pnl.gov](mailto:Susannah.Burrows@pnl.gov)** – Pacific Northwest National Laboratory – BER  
*I'm an atmospheric physicist focused on advancing understanding of the processes controlling atmospheric aerosols and other trace constituents, and their interactions with climate and the Earth System. I do this by developing, implementing, and advancing models that incorporate findings from laboratory, field, and remote sensing data, often in close collaboration with experimental and observational experts. I have a strong history of mentoring students and postdoctoral research associates throughout my career; former mentees have gone on to a variety of new roles in academia, research institutions, and the private sector.*

**Zhehui (Jeph) Wang - [zwang@lanl.gov](mailto:zwang@lanl.gov)** - Los Alamos National Laboratory - BES, NP, HEP, NP and DOE IP  
*Dr. Wang is a focus team leader at LANL. His research and collaboration cover many topics in experimental physics with strong ties to both fundamental physics and applied science. One of the recent directions is to apply the ideas and methods of data science to enhance measurements and data interpretation.*

**Nobuo Sato – [nsato@jlab.org](mailto:nsato@jlab.org)** – Jefferson Lab/NSU – NP  
*Research in nuclear tomography, perturbative QCD phenomenology and machine learning.*

**Sally Dawson – [dawson@bnl.gov](mailto:dawson@bnl.gov)** – Brookhaven National Laboratory – HEP  
*My research centers around theoretical calculations for Higgs boson processes at future colliders and the study of new physics models involving electroweak symmetry breaking.*

**Ravi Madduri – [madduri@anl.gov](mailto:madduri@anl.gov)** – Data Science and Learning Division, Argonne National Laboratory – ASCR  
*My group works in the intersection of computing and biomedicine where we develop methods that enable large-scale data analysis and application of deep learning to problems in biomedicine and health.*

**Aaron Roodman – [roodman@slac.stanford.edu](mailto:roodman@slac.stanford.edu)** - SLAC National Accelerator Laboratory - HEP  
*My main research interest is the study of Dark Energy using data from imaging surveys such as the Dark Energy Survey and the upcoming Vera C. Rubin Observatory's Legacy Survey of Space and Time. We use the observation of hundreds of millions, or billions, of galaxies to study the accelerated expansion of the universe and the distribution of matter in the universe to better understand Dark Energy. Research opportunities include topics such as weak and strong gravitational lensing, photometric redshift calibration, point spread function estimation as well as studies of the LSST Camera's operation and performance.*

SCGSR Awards and Publications

Eligibility

Benefits

Participant Obligations

How to Apply

Identifying a Collaborating DOE Laboratory Scientist

View Potential Collaborating Scientists

Research Proposal Guidelines

Office of Science Priority Research Areas for SCGSR Program

Letters of Support

Graduate Transcripts for Current Graduate Institution

Application Evaluation and Selection

Participating DOE National Laboratories/Facilities and Points of Contact

Information for Laboratory Scientists and Thesis Advisors

Key Dates

Frequently Asked Questions

A Non-Exhaustive List!



# SCGSR Applications

**Only COMPLETE applications will be considered!**

1. All required fields of the Online Application System
2. Official graduate transcripts and proof of Ph.D. Candidacy  
**Remove SSN or dates of birth from transcripts**
3. Letters of Support: - graduate thesis advisor  
- collaborating DOE national laboratory scientist
4. Research Proposal (**3-pages maximum**)

**Deadline: May 1, 2024, 5:00 PM ET**

# Online Application System

<https://apps.orau.gov/SCGSR/Account/Login>

1. Complete a page before moving on, otherwise it won't be saved
2. Gray non-fillable boxes → need to fill prior sections
3. If you don't have the answer or document, type in or upload **placeholders**, remember to **come back and replace** the placeholders when ready
4. E-mails for advisor and collaborating scientist **sent from the system**, you must upload their information

Provide all the required information in the application form.

You must complete all required information on each page of the application before that page can be saved. If you navigate away from a page without saving, the information you entered will need to be re-entered.

**Important:** In the Professional Background section of the application, you must provide the name and address of your current institution on the same page where you must upload your **official graduate transcript**. Therefore, you are required to upload your transcript before you can send an email requesting the letter of support from your thesis advisor.



# Proposal Structure

## 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:

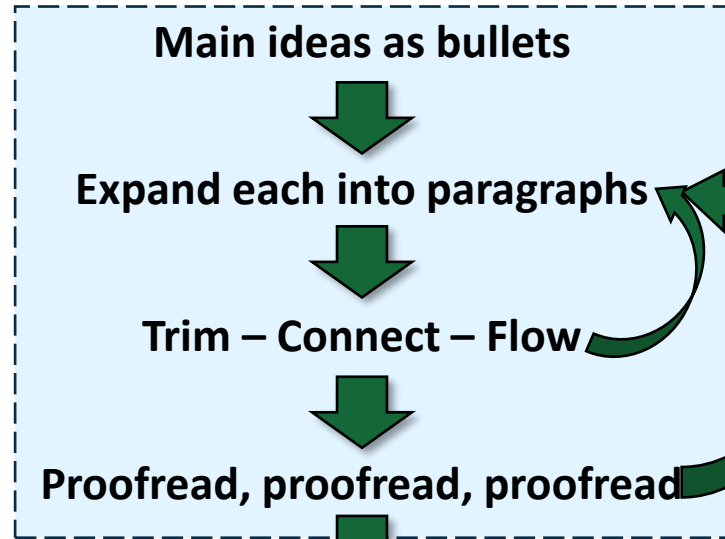
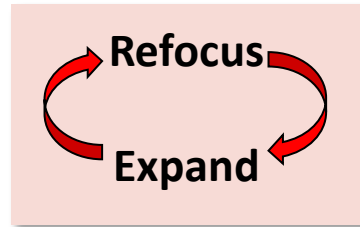
Expected pace of progress?

**Build in time for trainings!**

**3 pages**

**6. References:**  
Separate **1** page.

# A Possible Workflow



Highlight Key Points!

Colleague's feedback  
Does your message get across the way you thought?

PhD Thesis Advisor and Collaborating Scientist

The Strength of your  
Argument for Funding



What is the innovation?  
How important is the work?  
**Scientific excitement!**



# 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**?

# A Few Thoughts from the Reviewer's Perspective

- 1) **Clarity**: make readers' lives easier: *identify key points* for them
  - discussions around key ideas – articulate connections
- 2) How well defined is your **hypothesis or problem statement** → how well you can design your activities
  - Are your **research activities** adequately designed to test the hypotheses?
  - How well can you control or account for key **variables/parameters/conditions**?
  - Will they provide new insights? Lead to new questions? **Impact on the scientific community!**
- 3) Identifying the **challenges** → “Good understanding of the challenges” → you understand the science
  - Contingency plans
- 4) Are methods/conditions/model systems/tools appropriate? The **best tools** for your specific problem?
- 5) Could you do this in your own university? Do you know what tools you need, what are **all** the tools that are available at the lab?
- 6) **Essential details**: not all the details but the most relevant ones to understand the work you plan to do.

# Science Writing Tips

*Writing Science in Plain English*

Anne E. Green



1. Why Write Science in Plain English?
2. Before You Write
3. Tell a Story
4. Favor the Active Voice
5. Choose Your Words with Care
6. Omit Needless Words
7. Old Information and New Information
8. Make Lists Parallel
9. Vary the Length of Your Sentences
10. Design Your Paragraphs
11. Arrange Your Paragraphs

- Short! (<100 pages)
- Provides before and after edit examples
- Provides passages for you to practice

# Omit Needless Words

“Inhalation of vapor phase particulate matter chemical contaminants from biomass combustion in domestic settings is a significant contributor to local disease burden.” (22 words)

“Domestic wood smoke causes local health problems.” (7 words)

Anne E. Green *Writing Science in Plain English*, p40



# Omit Needless Words

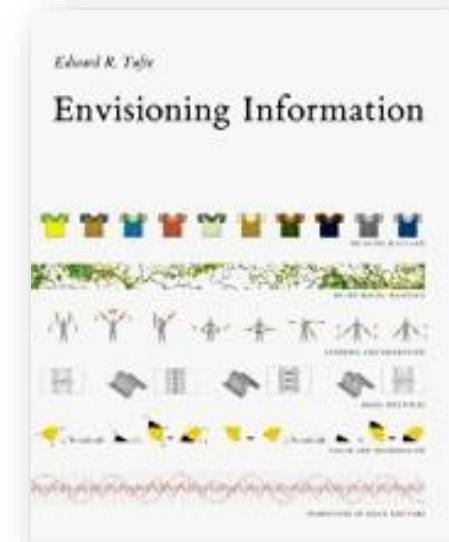
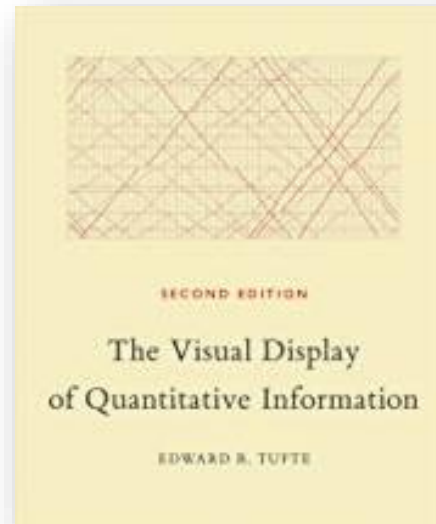
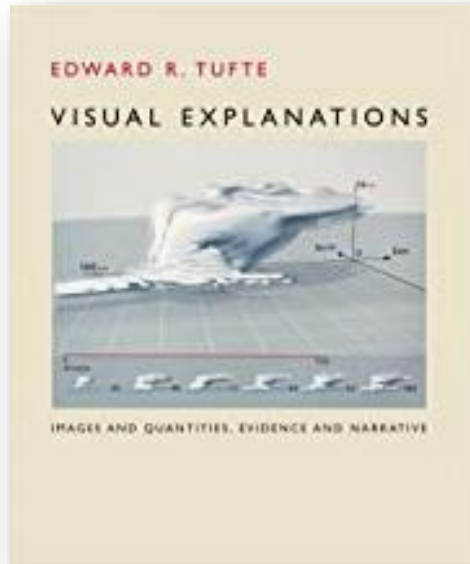
in this study we assessed  
conduct an investigation of  
the analysis presented in this paper  
during the course of  
undertake an examination of  
past research has shown

we assessed  
investigate  
our analysis  
during  
study  
research has shown

Anne E. Green *Writing Science in Plain English*, p43

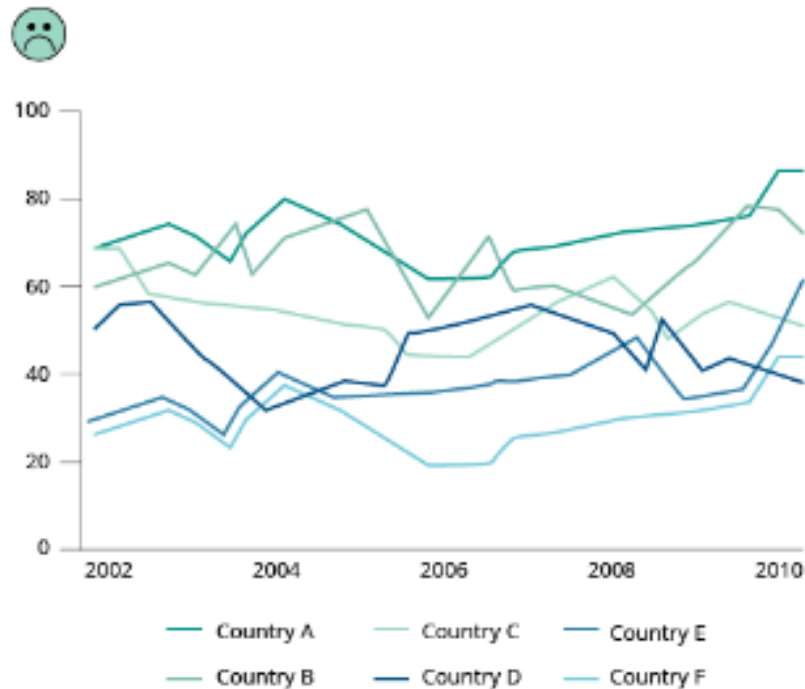
# Presenting Data

Books by Edward R. Tufte



# Presenting Data

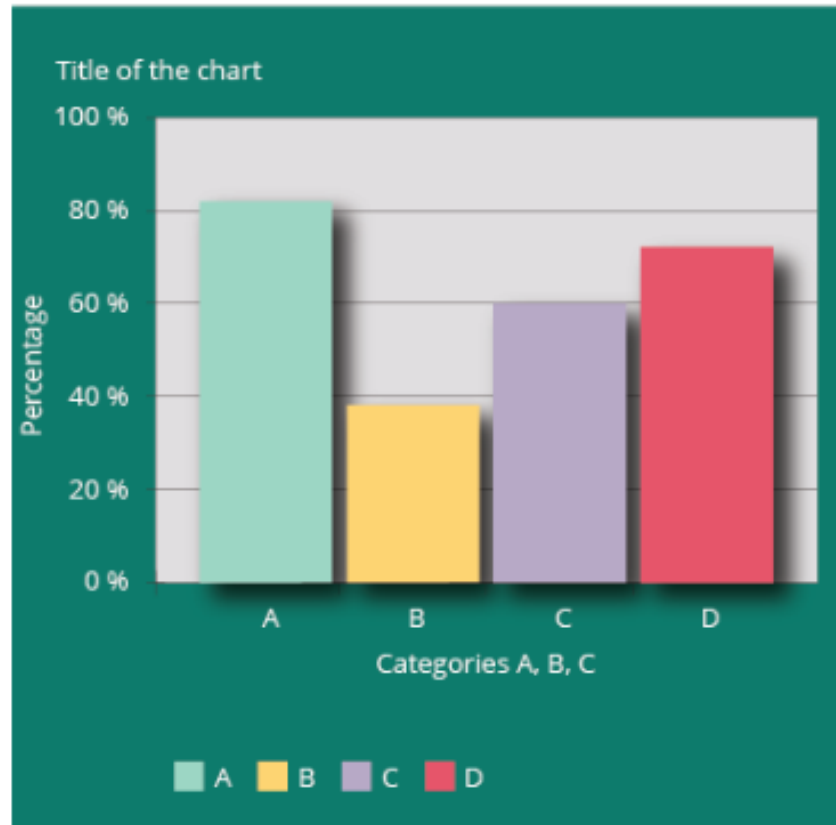
Label the line, not the legend



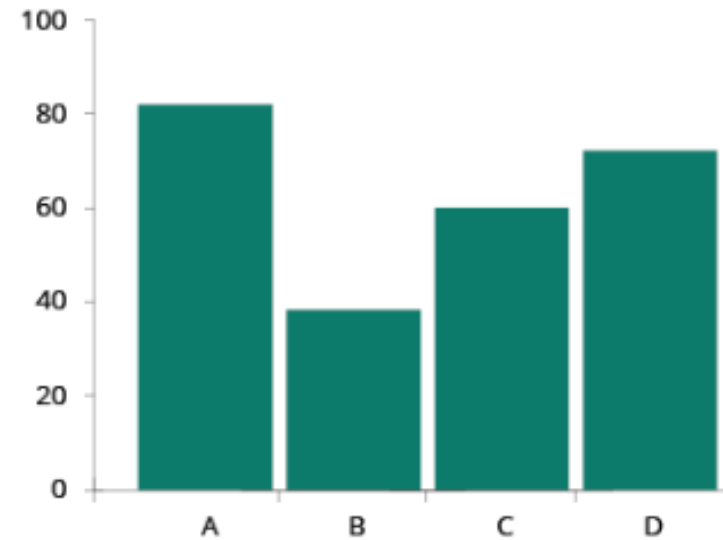
[Dos and don'ts of data visualisation — European Environment Agency \(eea.europa.eu\)](http://eea.europa.eu) — European Environment Agency

# Presenting Data

Remove visual clutter



**Title of the chart**  
Percentage



[Dos and don'ts of data visualisation — European Environment Agency \(eea.europa.eu\) — European Environment Agency](#)

# Questions So Far? Discussion Time



# Panels in Gather.Town

<https://app.gather.town/invite?token=sMeoq2CVRwGaWHnFldj1>



## Dress code:

Attendees (applicants): **Green**  
Former/current awardees: **Red**  
National Lab scientists: **White**  
SCGSR program: **Black**

# Panels in Gather.Town

<https://app.gather.town/invite?token=sMeoq2CVRwGaWHnFldj1>

Meet with a scientist  
(4:00 – 4:30 pm ET)

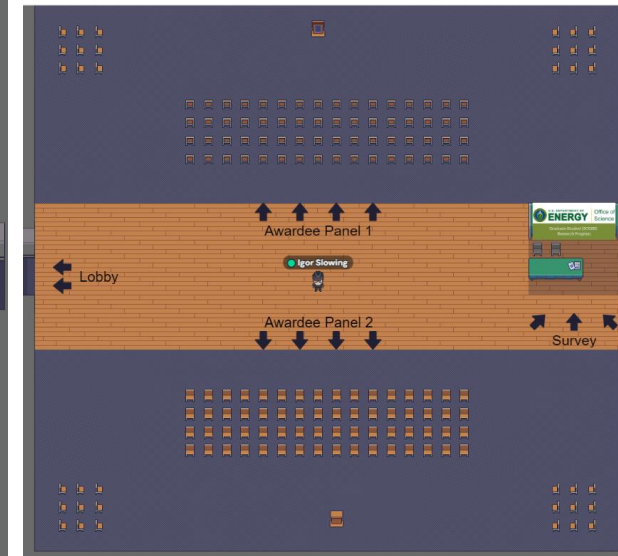


Scientists Panels  
(3:30 – 4:00 pm ET)



Meet with a  
current awardee  
(4:00 – 4:30 pm ET)

Awardee Panels  
(3:00 – 3:30 pm ET)



# Panels with 2022 S2 SCGSR Awardees

## Panel 1:

- **Andrea Kraetz** – BNL – *Gas phase chemical physics*: Understanding the properties of e-beam stabilized ZIF-L.
- **Riley Barton** – PNNL – *Environmental system science*: Novel analytical method informing reactive transport of fire-derived carbon in watersheds.
- **Glenn Richardson** – SLAC – *Fundamental Symmetries*: Designing a readout system for a next generation rare event detector (nEXO).

## Panel 2:

- ~~**Emily Duden** – BNL – *Experimental research in high energy physics*: Understanding the Cold Noise in the ITk strip detector modules of ATLAS.~~
- **Alexander Von Rueden** – PNNL – *Fundamental electrochemistry*: Atomic scale understanding of ORR in Au(100) using *ab initio* MD simulations.
- **Winnie Shi** – ORNL – *Biomolecular Imaging*: Conformational studies of synthetic polymer analogs



# Panels with National Laboratory Scientists

## Panel 1:

**Dr. Liqin Ke** – Ames – Computational design of two-dimensional (2D) quantum materials.

**Dr. Max Delferro** – ANL – Catalysis science, surface organometallics, plastic upcycling.

**Dr. Mircea Cotlet** – BNL – Light-matter interactions in low dimensional materials, ultrafast spectroscopy, microscopy.

**Dr. Krzysztof Gofryk** – INL – Strongly correlated electron systems, 5f-materials, quantum criticality, heavy fermions.

## Panel 2:

**Dr. David Christian** – FNAL – Experimental particle physics, detectors, DUNE experiment.

**Dr. Peter Nugent** – LBNL – Cosmology, physics of Supernovae, computational astrophysics.

**Dr. Eric Schwegler** – LLNL – Quantum simulations, critical materials institute.

## Panel 3:

**Dr. Wei Shi** – NETL – Atomistic simulation tool, chem-informatics, and machine learning for materials design.

**Dr. Matthew Beard** – NREL – Quantum confined materials, ultrafast spectroscopy, solar photochemistry.

**Dr. Jeffrey Warren** – ORNL – Plant ecophysiology, soil-plant water relations, terrestrial biosphere models.

**Dr. David Gaskell** – TJNAF – Experimental high energy physics.

## Panel 4:

**Dr. Kirsten Hofmockel** – PNNL – Soil biogeochemistry, understanding ecosystem responses to environmental changes.

**Dr. Egemen Kolemen** – PPPL – Dynamics and control theory in plasma physics.

**Dr. Christopher Shaddix** – SNL - Laser diagnostics, soot formation, coal and biomass combustion and gasification.

**Dr. Brian Lenardo** – SLAC – Experimental particle physics, rare phenomena, nEXO experiment.

# Thank You!

Remember:

the deadline for application is  
**May 1, 2024 at 5:00 PM ET**

More questions:

[Igor.Slowing@science.doe.gov](mailto:Igor.Slowing@science.doe.gov)  
[DOE-SCGSR@ORAU.org](mailto:DOE-SCGSR@ORAU.org)

We will now move to Gather.Town for the awardee and scientist panels

<https://app.gather.town/invite?token=sMeoq2CVRwGaWHnFIdj1>

There will be a feedback poll in Gather.Town!

