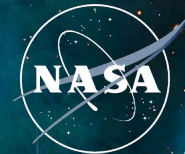




Year of Open Science

National Aeronautics and
Space Administration



A NASA OPEN-SOURCE SCIENCE MISSION

TOPS: TRANSFORM TO OPEN SCIENCE

Dr. Chelle Gentemann, TOPS Program Scientist
Yvonne Ivey, TOPS Project Manager
Cyndi Hall, TOPS Community Coordinator
Isabella Martinez, TOPS Curriculum Curator
Dr. Yaitza Luna-Cruz, OSSI/TOPS Science Coordinator
Dr. Danielle Groenen, Science Communications
Sam Gebre & Ryan McGranaghan, TOPS Science Advisors

Kevin Murphy, Chief Science Data Officer SMD
Katie Baynes, Deputy Chief Science Data Officer SMD
Dr. Steve Crawford, Science Data Officer SMD
Dr. Elena Steponaitis, Program Officer
Amy (Uyen) Truong, Chief Science Data Office Coordinator
Christian Reyes, OSSI Coordinator

Shelley Stall, Vice President, Data Leadership, AGU
Lauren Parr, Senior Vice President, Meetings & Learning, AGU
Chris Erdmann, Assistant Director, Data Stewardship, AGU
Laura Lyon, Program Manager, Science, AGU
Brooks Hanson, Executive Vice President, Science, AGU

TOPS Code of Conduct



We strive to create a welcoming and inclusive culture that empowers people to provide outstanding open science. That requires an open exchange of ideas balanced by thoughtful guidelines.

It would be impossible to list everything staff can do to create a more welcoming space, and we know this team will find ways to include their colleagues that we haven't even thought of. But when in doubt, we encourage you to look to these principles for guidance:

- Practice empathy and humility.
- Participate in an authentic and active way. In doing so, you contribute to the health and longevity of this community.
- Exercise consideration and respect in your speech and actions.
- Assume that everyone we work with is doing their best work for open science.
- Listen carefully and actively.
- Ask questions, and seek to understand your partners' context.
- Encourage other people to listen as much as they speak.
- Attempt collaboration before conflict.
- Treat other people's identities and cultures with respect. Make an effort to say people's names correctly and refer to them by their stated pronouns.
- Be mindful of your surroundings and of your fellow participants. Alert community leaders if you notice a dangerous situation, someone in distress, or violations of this Code of Conduct, even if they seem inconsequential.



TOPS Code of Conduct

The primary goal of TOPS is to be inclusive to the largest number of contributors, with the most varied and diverse backgrounds possible.

TOPS expects everyone to comply with our code of conduct, communicating openly with respect for others and critiquing ideas rather than individuals.

Anyone not abiding by the TOPS Code of Conduct will be asked to leave the forum. If you are the subject of unacceptable behavior or have witnessed any such behavior, please immediately notify Chelle Gentemann via chat or chelle.gentemann@nasa.gov.

For more information, review the code of conduct found on the TOPS GitHub.





Submit Feedback or Suggestions

Your inputs are essential to the success of our mission. Please feel free to submit questions, feedback, or suggestions via the feedback tool.

You can use the QR code to access the feedback tool





Agenda

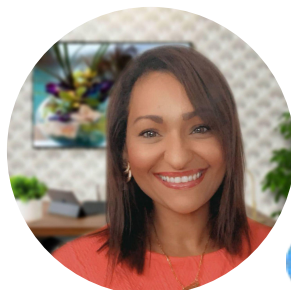
<i>Time (ET)</i>	<i>Agenda Item</i>	<i>Speaker</i>
1:00 pm	Welcome and Review of Code of Conduct	Cyndi Hall
1:05 pm	TOPS Updates	Cyndi Hall
1:10 pm	Fun Word Art Activity	Cyndi Hall
1:15 pm	Open Science Curriculum Overview	Isabella Martinez
1:25 pm	Breakouts on Each of the Modules	TOPS team
1:55 pm	Next Steps	Cyndi Hall

TOPS News



Upcoming Blog: Success Stories of Open Science

Written by TOPS Summer intern, [Steffie Kim](#)



New TOPS
Program Officer:
Dr. Yaítza
Luna-Cruz
[@drlunacruz](#)

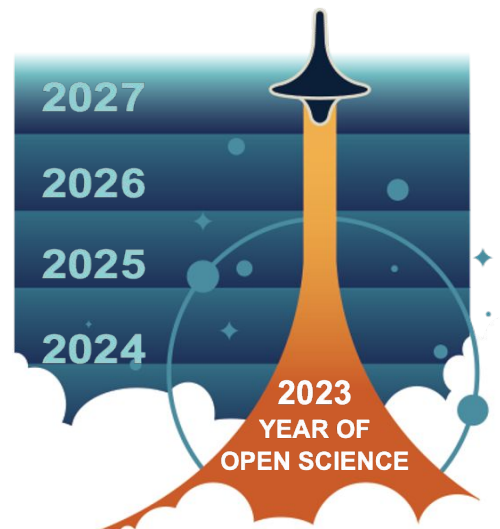


Sam Gebre,
NASA Ames
[@SamGebre1](#)



Ryan McGranaghan
NASA Goddard
[@AeroSciengineer](#)

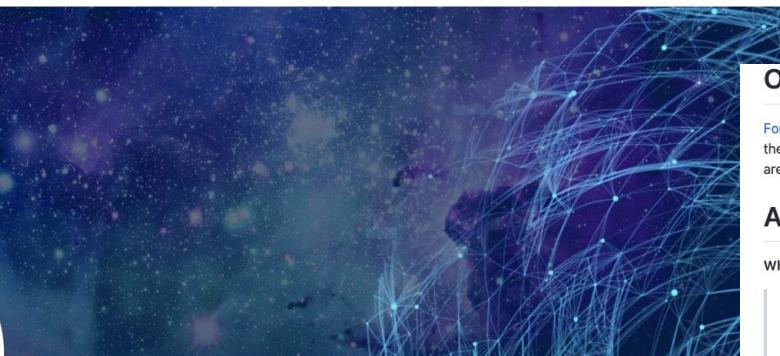
Coming Soon: TOPS
funding announcement for
Year of Open Science
activities





Follow us on Twitter


#NASATOPS & #IHeartOpenScience



Following

TOPS - Transform to Open Science

@ToOpenScience Follows you

@theAGU TOPS  Part of #NASATOPS mission to unlock the full potential of a more equitable, impactful, efficient, scientific future. Not an official NASA account

 Everywhere  github.com/nasa/Transform...  Joined May 2022

Inspirational stories!

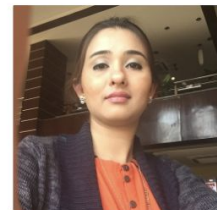
OpenCore SME Highlights

Forty amazing [subject matter experts \(SMEs\)](#) have been working since late June to gather the content for the TOPS OpenCore. We asked them what inspired them to join the Open Science community and have received permission to share some of their responses here. There are many paths to open science - and we hope some of their paths inspire you!

Amber Osman

Why I practice open science?

I faced issues in doing research because the research content available was blocked behind paywalls and our institution had limited subscription access to research databases. The open access initiatives provided platform for everyone to easily access research materials and collaborate on global level and that's why I practice Open Science; it definitely allows progression in science.



How did I get involved in open science?

While doing different research studies as a student then my job was related to research & development; being an Editor for a journal and all these roles & responsibilities brought me close to Open Science practices. I joined the Creative Commons movement and other renowned publishing platforms for open science & best practices in scholarly communication advocacy because I believe that the right to open knowledge is for all.

Elio Campitelli

Why I practice open science?

Because what other science is there? Science is a collaborative enterprise that builds upon the work of a community, so methods, data and results need be open for it to work properly. You cannot see further if the shoulders of the giants you need to stand on are tucked away behind a paywall.

How did I get involved in open science?

By doing science myself. I new I needed to make my results open and so searched around for tools



Open Source Science Data Repositories Workshop



When: Tuesday through Friday, 27-30 September 2022

Where: Virtual with an option for in person attendance at Langley Research Center

What: Join the Chief Science Data Office on a 4 day workshop to engage with the NASA data repositories on the next steps in sharing NASA scientific information and open science.

Themes:

- Core Data and Computing Services for Open Source Science
- Cross divisional tools for science discovery and exploration
- Transform to Open Science (TOPS)
- SMD policies and standards related to Open Science
- Diversity, Equity and Inclusion at Data Repositories

The conference will be a mix of talks, unconference sessions, and demonstrations

Further information: Use QR Code below or navigate to the workshop website where you can register to attend:

<https://science.nasa.gov/open-science-overview/data-repositories-workshop>





TOPS OpenCore Curriculum Update

Isabella Martinez, Curriculum Curator





TOPS OpenCore Vision

The TOPS open science curriculum is designed for a NASA-funded scientists or future NASA-funded scientists with limited knowledge about open science who are looking to upskill to continue collaborating in NASA Science activities.

Understanding

Help participants gain a nuanced **understanding** of the open science ethos and workflow.

Process

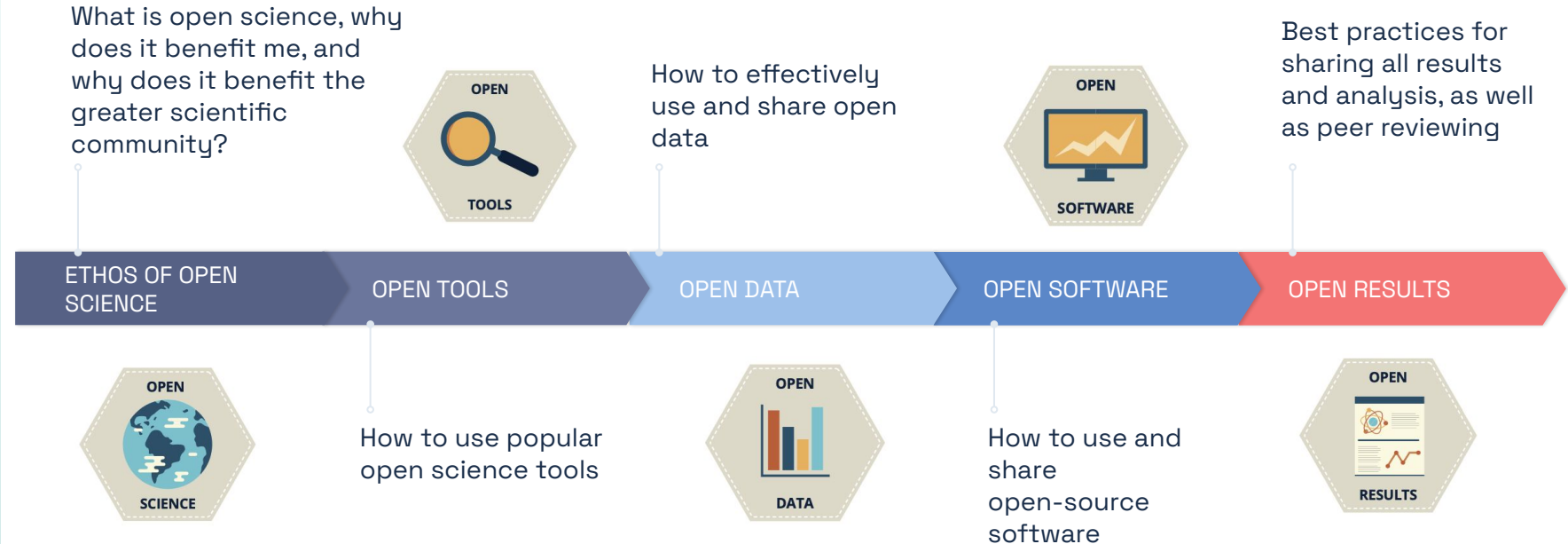
Show participants the tools needed to follow an open science **process** and thus **actively participate** in open science communities.

Benefits

Familiarize participants with the **benefits** of open science at large, and the concrete benefits to them and their research.

TOPS OpenCore Structure

The TOPS open science curriculum will be divided into five modules, representing a full scientific workflow.





Ethos of Open Science

Module Objectives

- ❖ Present the definitions of open science, with concrete examples
- ❖ Introduce best practices for building open science communities, increasing collaboration, and introducing open principles
- ❖ Explore of how open science seeks to create a more diverse and equitable scientific community

Proposed Module Structure

- ❖ Introduction to Ethos of Open Science
- ❖ Basic Open Science Principles
- ❖ Open Science Communities
- ❖ Benefits and Challenges of Open Science
- ❖ Open Science Success Stories

Open Tools & Resources

Module Objectives

- ❖ Experience working with different open science tools, databases and datasets, and policies
- ❖ Introduce open science communities in different fields

Proposed Module Structure

- ❖ Introduction to Open Science Tools
- ❖ Tools for Open Data
- ❖ Tools for Open Software
- ❖ Tools for Open Results
- ❖ Community Stories



Open Data

Module Objectives

- ❖ Introduce data management plans that follows FAIR principles
- ❖ Explore licenses and copyright standards (United States)
- ❖ Introduce metadata, including how to create and utilize metadata

Proposed Module Structure

- ❖ Introduction to Open Data
- ❖ Using Open Data
- ❖ Making Open Data
- ❖ Sharing Open Data

Open Software

Module Objectives

- ❖ Practice with choosing a license, creating a README, and uploading code to GitHub/GitLab
- ❖ Gain an understanding of the importance of high-quality and documented code
- ❖ Discuss the impact of open-source software on open science and advancing equity in scientific fields

Proposed Module Structure

- ❖ Introduction to Open Software
- ❖ Using Open Software
- ❖ Making Open Software
- ❖ Sharing Open Software

Open Results

Module Objectives

- ❖ Understand how open science principles help with increasing the reproducibility and replicability of research,
- ❖ Understand how to find and select locations for publishing open research and results
- ❖ Experience creating a replicable, open science workflow and using a virtual research environment

Proposed Module Structure

- ❖ Introduction to Open Results
- ❖ Using Open Results
- ❖ Making Open Results
- ❖ Sharing Open Results



What Are We Doing Today?

Bring your own experiences to the table and discuss how the stated learning objectives for each module meet or do not meet the needs of your scientific community!

- ❖ The OpenCore is primarily intended to serve as an introduction to open science for a NASA scientist or future NASA scientist who is mostly new to open science.
 - Do you feel that these learning objectives are well-suited for someone who is new to open science?
 - What could be added to, or removed from, this module to better introduce a beginner to this aspect of open science?

NOTE: If you leave the breakout room, you will be leaving the meeting!

Breakout Rooms

Learn more and
collaborate with us!



TOPS Email List



TOPS Website



How Are We Capturing Today's Discussion?

We want to create a safe space to capture meaningful feedback about what you want from the TOPS open science curriculum.

- ❖ We are **not** recording the breakout room sessions
- ❖ We **are** transcribing the breakout room sessions
- ❖ We **will anonymize** the transcripts before sharing them in our TOPS G-Drive or on GitHub

For Discussion: Ethos of Open Science

Proposed Module Topics

- ❖ Explain why Open Science matters to specific research projects, science writ large, and society;
- ❖ Explain the advantages and challenges of Open Science
- ❖ Select Open Science communities that are compatible with a research project
- ❖ Explain how Open Science is critical for building public trust in science and influencing key societal challenges
- ❖ Describe the key components and behaviors of Open Science
- ❖ Identify areas of concern in research that Open Science can address.
- ❖ Include stakeholders who will benefit from research done with Open Science
- ❖ Select Open Science workflows

For Discussion: Ethos of Open Science

Consider the proposed module structure on the right. For each lesson...

- ❖ What is important to cover in this lesson?
- ❖ What is important to the topic, but not critical for a beginner to learn?
- ❖ What practical or hands-on experience should a beginner gain from this module?
- ❖ Any proposed changes to the structure?

Proposed Module Structure

- ❖ Introduction to Ethos of Open Science
- ❖ Basic Open Science Principles
- ❖ Open Science Communities
- ❖ Benefits and Challenges of Open Science
- ❖ Open Science Success Stories

For Discussion: Open Tools

Proposed Module Topics

- ❖ Explain why open science tools encourage open science (e.g., using the FAIR and CARE principles)
- ❖ Identify Open Science communities and initiatives - within and across disciplines - and join a community of practice (CoP) of interest to you
- ❖ Provide examples of how open science is practiced in a research team
- ❖ Identify types of Open Science tools along with their purpose
- ❖ Match appropriate open science tools to specific objectives within the research workflow
- ❖ Describe 3-5 open science tools and how to use them in projects (e.g., for communication, sharing of results, giving credit, and collaboration)

For Discussion: Open Tools

Consider the proposed module structure on the right. For each lesson...

- ❖ What is important to cover in this lesson?
- ❖ What is important to the topic, but not critical for a beginner to learn?
- ❖ What practical or hands-on experience should a beginner gain from this module?
- ❖ Any proposed changes to the structure?

Proposed Module Structure

- ❖ Introduction to Open Science Tools
- ❖ Tools for Open Data
- ❖ Tools for Open Software
- ❖ Tools for Open Results
- ❖ Community Stories

For Discussion: Open Data

Proposed Module Topics

- ❖ Describe key characteristics of open data
- ❖ Categorize types of open data
- ❖ Communicate the benefits of Open data and its effects on science
- ❖ Communicate best practices for responsibly sharing data
- ❖ Explain the relationship between FAIR, CARE and Open Data
- ❖ Describe key features for effective data management planning
- ❖ Describe best practices for sharing open data

For Discussion: Open Data

Consider the proposed module structure on the right. For each lesson...

- ❖ What is important to cover in this lesson?
- ❖ What is important to the topic, but not critical for a beginner to learn?
- ❖ What practical or hands-on experience should a beginner gain from this module?
- ❖ Any proposed changes to the structure?

Proposed Module Structure

- ❖ Introduction to Open Data
- ❖ Using Open Data
- ❖ Making Open Data
- ❖ Sharing Open Data



For Discussion: Open Software

Proposed Module Topics

- ❖ Explain the benefits and challenges that producing open software encompasses.
- ❖ Be able to identify resources for Open Software relevant for a scientific field.
- ❖ Identify key markers of open software in code
- ❖ How to cite others' software in publications
- ❖ Differentiate open, reproducible, and executable code
- ❖ Publish software openly so others may access, use, and grow the software

For Discussion: Open Software

Consider the proposed module structure on the right. For each lesson...

- ❖ What is important to cover in this lesson?
- ❖ What is important to the topic, but not critical for a beginner to learn?
- ❖ What practical or hands-on experience should a beginner gain from this module?
- ❖ Any proposed changes to the structure?

Proposed Module Structure

- ❖ Introduction to Open Software
- ❖ Using Open Software
- ❖ Making Open Software
- ❖ Sharing Open Software

For Discussion: Open Results

Proposed Module Topics

- ❖ Identify research stages and elements of research objects that can be considered results
- ❖ Identify the guiding practices and principles related to open results and the advantages of implementing them across stages of a research process
- ❖ Apply open result principles to new and ongoing research projects
- ❖ Identify paths for publicly communicating results
- ❖ Create open results contributor guidelines and opportunities for open and equitable collaborations
- ❖ Give credit to contributors in open results
- ❖ Contribute and provide constructive feedback to others' results

For Discussion: Open Results

Consider the proposed module structure on the right. For each lesson...

- ❖ What is important to cover in this lesson?
- ❖ What is important to the topic, but not critical for a beginner to learn?
- ❖ What practical or hands-on experience should a beginner gain from this module?
- ❖ Any proposed changes to the structure?

Proposed Module Structure

- ❖ Introduction to Open Results
- ❖ Using Open Results
- ❖ Making Open Results
- ❖ Sharing Open Results



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