National Aeronautics and
Space Administration

NASA Science Mission Directorate (SMD)
F.15 High Priority
Open-Source Science (HPOSS)
Information Session
January 19, 2023

Dr. Rachel Paseka, SMD Support Scientist & Program Officer
Dr. Steve Crawford, SMD Science Data Officer
**Cynthia Hall,** NASA TOPS Community Engagement

How to Participate in Today's Event

- We are recording today's event. The slides and presentation recording will be posted.

- Please submit your questions here: https://nasa.cnf.io/sessions/tgn4/#!/dashboard

- Attendees are muted by default. Please raise your hand if you would like to ask a question aloud.

- Questions from today's event will be added to a list of Frequently Asked Questions, to be posted on NSPIRES.

Agenda

- Background on NASA's Open-Source Science Initiative

- High Priority Open-Source Science Program Overview

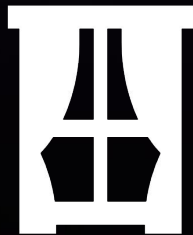- Proposal Preparation and Review Highlights

- Question & Answer
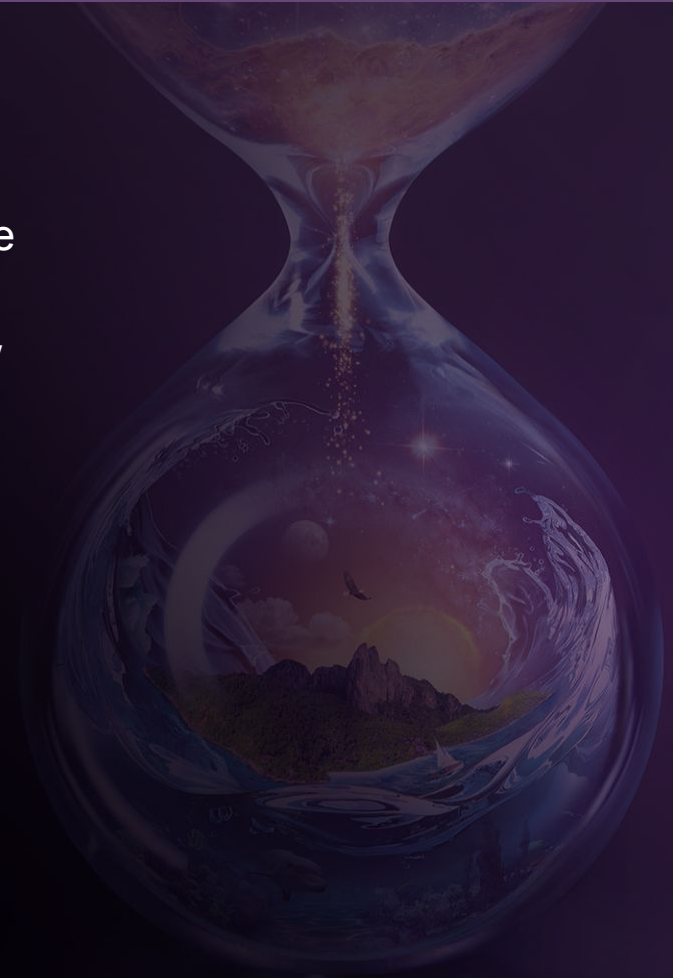
Background: NASA's Open-Source Science Initiative

Principles of Open Science

Transparent
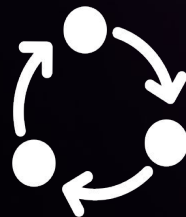scientific process and results should be visible, accessible, and understandable

Accessible
data, tools, software, documentation, and publications should be accessible to all (FAIR)

Inclusive
process and participants should welcome participation by and collaboration with diverse people and organizations

Reproducible
reproducible by members of the community

# Open-Source Science is NASA's method to put Open Science into practice

- **Open** the entirety of the scientific process, *from start to finish*

- **Broaden** community involvement in the scientific process

- **Increase** accessibility of data, software, & publications

- **Facilitate** inclusion, transparency, and reproducibility of science

NASA SMD's Open Source Science Initiative (OSSI) is a broad program of activities to enable moving science toward openness.

OSSI aims to implement SMD's Strategy for Data and Computing

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The Open-Source Science Initiative aims to make science more Accessible, Reproducible & Inclusive
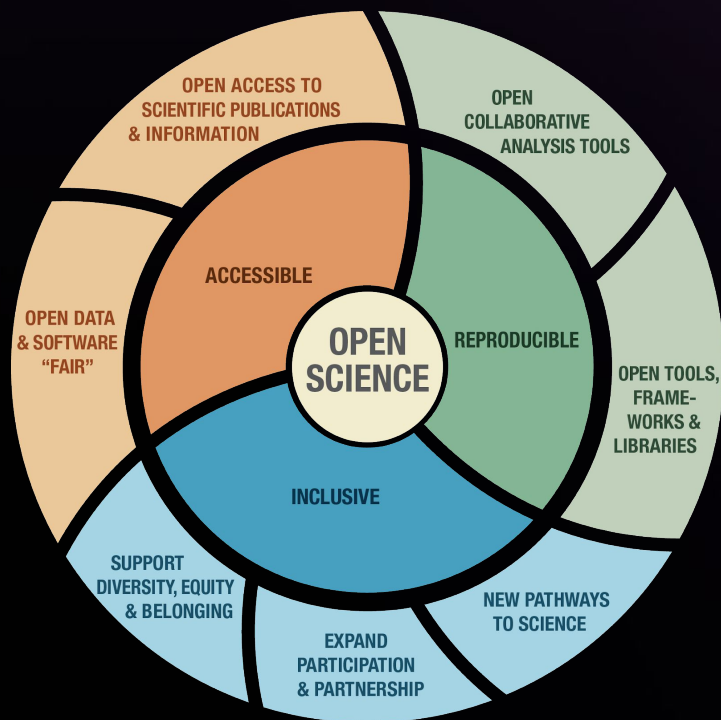
Creates research that:
- Is cited more
- Has a bigger impact
- Increases transparency
- Is more inclusive

Inclusive science means more:
- Collaborative projects
- Access to 'hidden knowledge'
- Equitable Systems
- Increased Participation

Policy

Infrastructure

NASA's
Open-Source
Science Initiative
$20M/year

Funding

Community

NASA Transform to Open Science (TOPS)

A $40 million, 5-year mission to accelerate adoption of open science

Strategic Goals:
- Support 20K researchers to earn NASA's open science badge
- Double the participation of historically excluded groups across NASA science
- Enable five major scientific discoveries through open science principles

Engagement **Capacity Sharing** **Incentives**

Open Data
Open Software
Open Access
Community

Coordination

Join us as we embark on the 2023 Year of Open Science with NASA TOPS!

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OSSI Funding Opportunities through ROSES

F.2 Topical Workshops, Symposia, and Conferences

Events, Hackathons, un-conferences, and challenges that build open science skills, Training in open science. Rolling deadline.

F.7 Support for Open Source Tools, Frameworks, and Libraries

Support and maintain open source tools, frameworks, and libraries that are significantly used by the SMD community. $2M awarded in ROSES-20 to 8 programs. Once every 3 years.

F.8 Supplemental Open Source Software Awards

Supplemental award to encourage the conversion of legacy software to open source. $200K awarded in ROSES-20 to 6 awards. Yearly, $250K available, rolling deadline.

F.14 Transform to Open Science Training

Tutorials showcasing open science in action and NASA cloud data, summer schools, virtual cohorts. Budget of $4.5M per year. Once every three years.

F.15 High Priority Open-Source Science

Supporting innovative open source tools, software, frameworks, data formats, and libraries. Budget ~$1M. Yearly, rolling deadline.

F.16 Supplement for Software Platforms

Supplemental support to existing awards for usage of scientific platforms. Budget TBD.

High Priority Open-Source Science Program Overview

Scope: What is High Priority Open-Source Science?

- **Seeking innovative proposals that would advance and streamline the open sharing of scientific information.**
  - This could be in the areas of scientific publications, data, or software; or in areas that are not traditionally used to share scientific results but aim to make them more accessible to a larger audience of research scientists.

- Proposals should support the OSSI and advance the goals of increasing **transparency, accessibility, inclusion, and reproducibility** of research in the SMD scientific community.

- This program element supports the development of **innovative open-source tools, software, frameworks, data formats, and libraries** that will have a significant impact to the SMD science community.

Scope: Additional Considerations

- Proposals must clearly state how the work supports the OSSI. This may include:
    - increasing the accessibility and usability of new technology as defined by the SMD Strategy for Data Management and Computing for Groundbreaking Science
    - supporting the development of technology in alignment with the goals of TOPS
- Proposals for work that will support the OSSI across the SMD scientific community may be given priority, though proposals for work corresponding to an individual SMD Division are also welcome.
- See Section 3.4 of the solicitation for additional examples of current programmatic themes for the Open-Source Science Initiative.

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Scope: Additional Considerations

- Proposals submitted in response to this program element must be for **new work that is not currently supported by SMD**.

- Proposals **may expand existing SMD-supported projects with the addition of innovative open-source tools, software, frameworks, data formats, and libraries**, as long as these are new additions that are not currently supported by SMD.

- Innovative **projects related directly to answering a scientific question** using new tools or software development **are to be submitted to the relevant program in each SMD Division**, e.g., D.2 Astrophysics Data Analysis, B.20 Heliophysics Tools and Methods, and F.19 Multidomain Reusable Artificial Intelligence Tools.
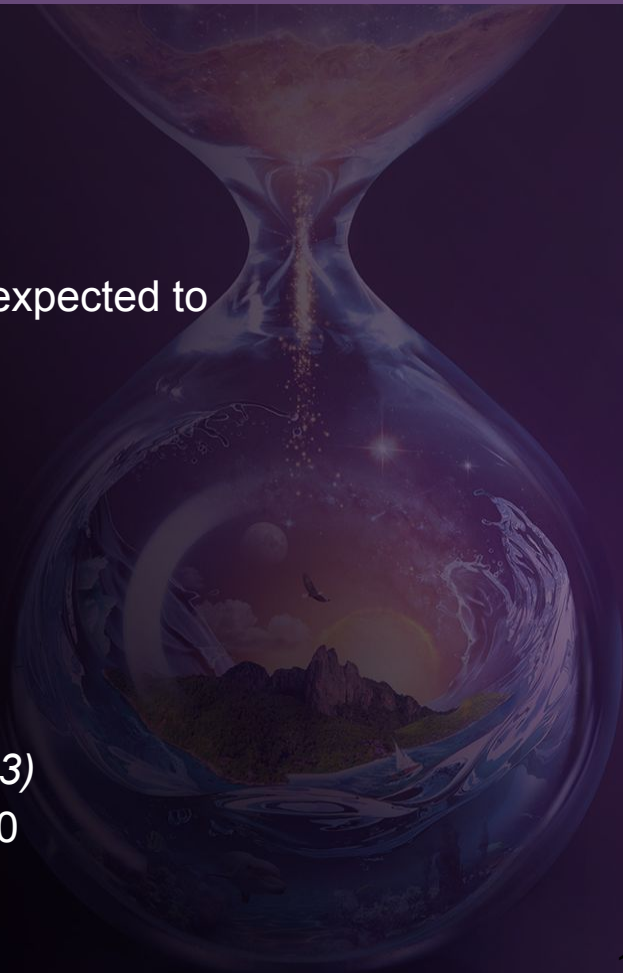
What will an HPOSS award entail?

- Each award will be approximately $100,000.
- Proposals submitted to this program element will be expected to complete the work within one year.

How many awards will be made?

- ROSES-2022 *(apply by March 29, 2023)*
  - $300,000 to support 3-5 awards of ~$100,000

- Planned for ROSES-2023 *(apply after March 29, 2023)*
  - $1,000,000 to support 6-10 awards of ~$100,000

Who is eligible for this program?

Eligibility for ROSES funding is based on the proposing organization, not the individual investigator. See section III of the ROSES-2022 Summary of Solicitation for full details on eligibility.

Participation is **open to all categories of U.S. institutions** including:
- Educational,
- For-profit, and not-for-profit organizations,
- Federally Funded Research and Development Centers,
- University Affiliated Research Centers,
- NASA Centers including JPL, and
- other Government agencies

Proposals from non-U.S. institutions are **welcome**, but they must be on a no-exchange-of-funds basis; funding may not be requested to support activities at non-US institutions but may be requested to support activities at US institutions, e.g., for funding a Co-Investigator at a U.S. institution.
NOTE: Restriction on NASA funding involving China, see the ROSES Summary of Solicitation for details.

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Proposal Preparation and Review Highlights

When are proposals due?

HPOSS accepts proposals on a rolling basis. There is No Due Date (NoDD).
- Proposals will be reviewed throughout the year.
- There is no need to submit a Notice of Intent (NOI) for HPOSS.

- Apply by March 29, 2023 for ROSES-2022.
- After March 29, 2023, you may apply for HPOSS under ROSES-2023.

- A proposal may not be resubmitted to the same or another program in the same ROSES year or to any NoDD program within one year of the most recent submission

- See Section 4.1 of the solicitation for more details on NoDD submissions.

What is an Open-Source Science Development Plan?

- Proposals must include an Open-Source Science Development Plan that describes how the scientific information resulting from the work will be made openly available.
    - The plan must describe the management of the data, software, and publications developed as part of the project and how they will be released openly.
    - The plan can also include any other activities that will support the sharing of scientific information.

- 2 page limit, anonymized, follow policies or guidance from the SMD Division most relevant to the proposal.

- These plans will become standard for ROSES proposals starting with ROSES-23, under the name 'Open Science and Data Management Plan'.
- See the SMD Open-Source Science Guidance for suggested components of an OSDMP.

What is Dual-Anonymous Peer-Review?

- Proposals submitted to this program will be evaluated using a dual-anonymous peer review (DAPR) process.
- Proposers are unaware of identify of reviewers; reviewers are not told the identity of the proposers until after evaluation of anonymized components of proposals.
- The objective of DAPR is to minimize bias in the evaluation of the merit of a proposal.

- Please follow the instructions in Section 4.3 of the solicitation to prepare your proposal for DAPR.

- Learn more: https://science.nasa.gov/researchers/dual-anonymous-peer-review

How will proposals be evaluated?

See Section 4 of the solicitation for full details.

The following elements must be included in the proposal to allow for evaluation:

- A clear description of the project and relevance to the SMD science community and the relationship to the NASA SMD Science Vision and Strategy for Data Management and Computing for Groundbreaking Science
- The development activities to be undertaken for the project (i.e., the innovative technology to be developed as part of the project and the work to be done to develop the technology)
- The project management approach (i.e., governance and development model, accessibility information, and timeline for completing the project)

For proposals advancing an existing project with the addition of innovative open-source tools, software, frameworks, data formats, and libraries, there must be clear support from the leadership of that project.
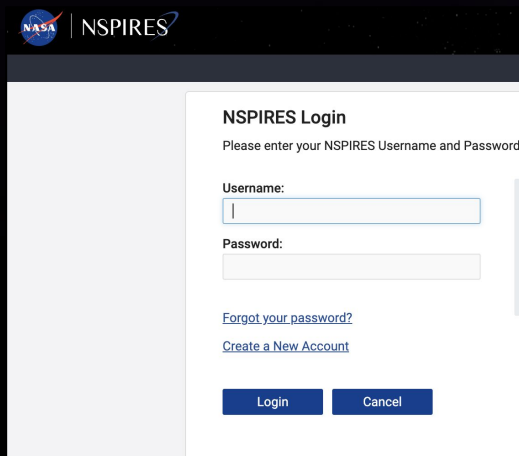
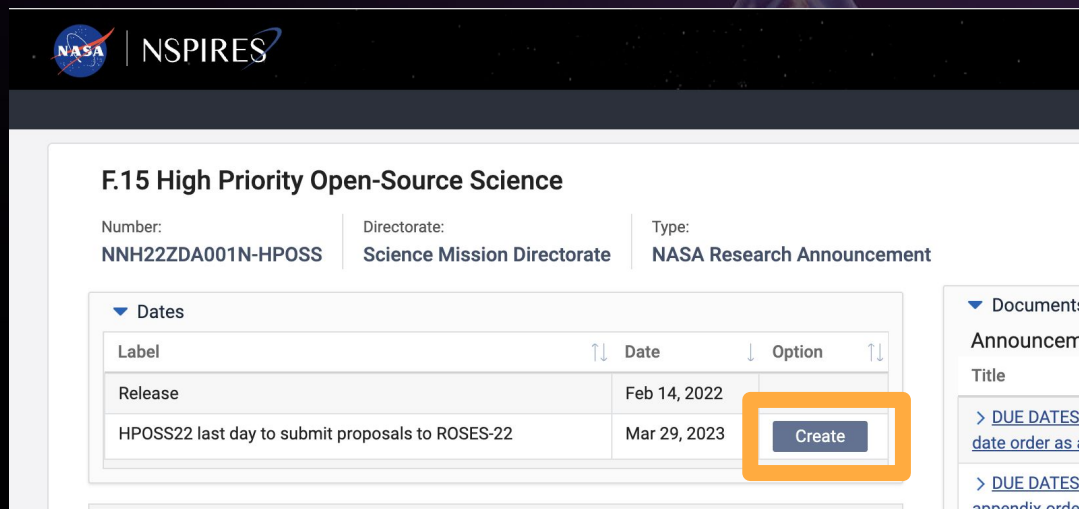**Resources and Contact Information**

How do I get started?

NSPIRES: NASA **S**olicitation and **P**roposal **I**ntegrated **R**eview and **E**valuation **S**ystem

1. Create an NSPIRES account

2. Start your submission through the HPOSS page

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HPOSS Resources and Contact Information

Resources

1. HPOSS page on NSPIRES
   Access official documentation
   Submit your proposal
   Coming soon: today's presentation & FAQ

2. General ROSES Guidance
   The NASA Guidebook for Proposers - 2022
   ROSES FAQ
   ROSES How to Guide

Points of Contact

Rachel Paseka
rachel.e.paseka@nasa.gov
(202) 731-3575

Steve Crawford
steven.m.crawford@nasa.gov
(202) 596-0442
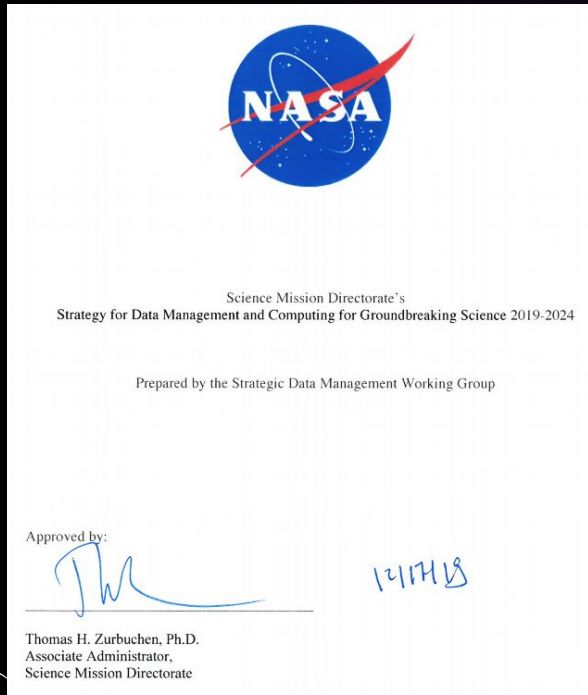
Question & Answer

Please submit your questions here:

https://nasa.cnf.io/sessions/tgn4/#!/dashboard

Backup Slides

What is the SMD Strategy for Data and Computing?

Science Mission Directorate's
Strategy for Data Management and Computing for Groundbreaking Science 2019-2024

Prepared by the Strategic Data Management Working Group

Approved by:

Thomas H. Zurbuchen, Ph.D.
Associate Administrator,
Science Mission Directorate

An SMD-approved strategy to enable transformational open science through continuous evolution of SMD's science data and computing systems.

Goal 1: Develop and Implement Capabilities to Enable Open Science

Goal 2: Continuous Evolution of Data and Computing Systems

Goal 3: Harness the Community and Strategic Partnerships for Innovation

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Summary: SMD Scientific Information Policy (SPD-41a)

Brings together existing NASA and Federal guidance on open data, software, and publications. Developed following community feedback.

Forward-looking: Applies to new missions and grants proposed to ROSES-23. Existing missions & grants should adopt if consistent with available resources.

SPD-41a implements the new memo from the OSTP on "Ensuring free, immediate, and Equitable Access to Federally Funded Research"

🔹 SPD-41A Highlights 🔹

Peer-reviewed publications made openly available, consistent with the OSTP memo.

Data and software shared at the time of publication.
Mission data released as soon as possible and unrestricted mission software developed openly.

Science workshops and meetings held openly to enable broad participation.

SMD Science Information Policy website

TOPS website

Infrastructure: Core Services

Science Discovery Engine

Develop and implement an SMD data catalog to support discovery and access to complex scientific data across Divisions.

Science Explorer

Extend the primary digital library portal for researchers in astrophysics, planetary science & heliophysics, the Astrophysics Data System (ADS), to support Earth and Biological and Physical Sciences

Data and Computing Infrastructure

On-going Data & Computing Architecture study to identify scientific data and computing capabilities and architectures that enable Open Science.

RFI closes Feb. 21