National Aeronautics and
Space Administration

ROSES24:
F.14 High Priority
Open-Source
Science +
F.8 Supplements
for Open-Source
Science

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How to Participate in Today's Event

- Questions submitted to the tool and upvoted will be addressed first.

- Attendees are muted by default. Attendees may be asked to raise their hand to further clarify a question submitted to the tool.

- Questions from today's event will be added to a list of "Frequently Asked Questions" and posted on the NSPIRES pages for F.14 HPOSS and F.8 SOSS.

- Today's event will be recorded. The slides and presentation recording will be posted on the NASA Open Science Funding page.

Please submit your questions to:
https://nasa.cnf.io/sessions/hk4n/#!/dashboard

Code of Conduct

By participating in this workshop, I will:
- Conduct myself with integrity, respect, honesty, and credibility.
- Approach all events, activities, and discussions with the highest ethical standards of professionalism and personal conduct.
- Avoid personal attacks or other activities that cause damage to other participants or the hosts.
- Value and respect diversity of views and opinions.

Reporting Unacceptable Behavior:
- If you are the subject of unacceptable behavior or have witnessed any such behavior, please immediately notify a meeting host.
- Notification should be done by contacting a host via direct chat or emailing your concern to steven.m.crawford@nasa.gov
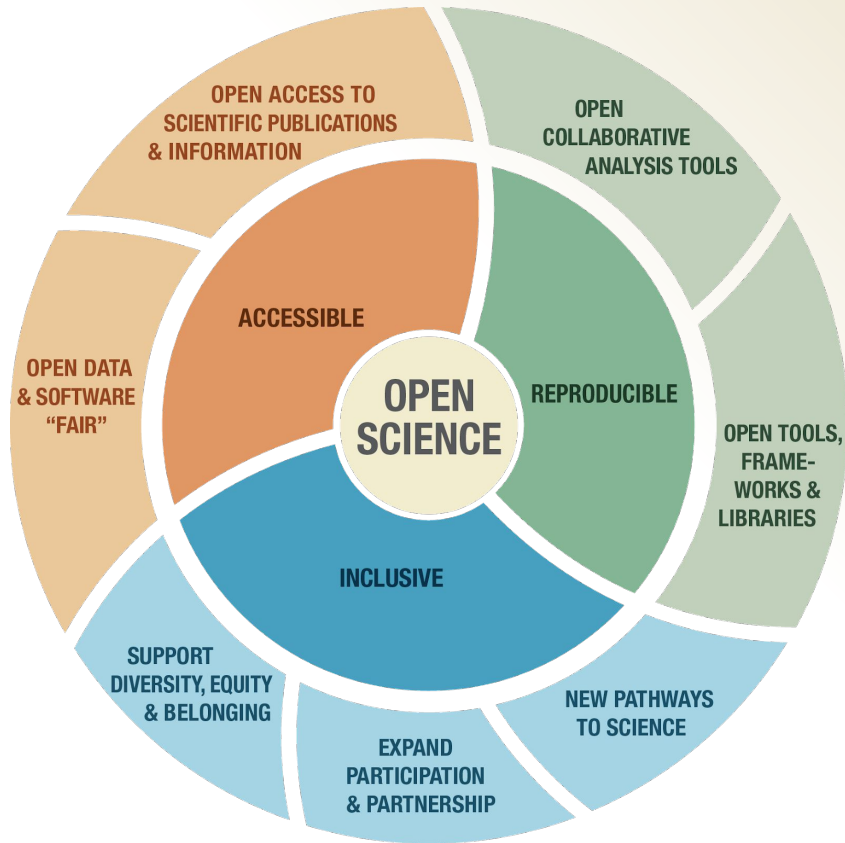
Full CODE_OF_CONDUCT.md

Agenda

01   BACKGROUND: OPEN SCIENCE AT NASA

02   F.14 HIGH PRIORITY OPEN-SOURCE SCIENCE

03   F.8 SUPPLEMENT FOR OPEN-SOURCE SCIENCE

04   QUESTION AND ANSWER

Open Science is Accessible, Reproducible & Inclusive

Creates research that is:

- Cited more
- Has a bigger impact
- Increases transparency
- More inclusive

Inclusive science means more:

- Collaborative projects
- Equitable Systems
- Increased Participation

Open Science

is the principle and practice of making research products and processes available to all, while respecting diverse cultures, maintaining security and privacy, and fostering collaborations, reproducibility and equity.

The Office of the Chief Science Data Officer *enables* Open Science through...

GOAL 1

Developing and implementing capabilities to enable Open Science practices and enable the use of data science activities

GOAL 2

Continuously evolve of data and computing systems for efficiency, sustainability, security and scientific integrity

GOAL 3

Enabling the scientific community in adopting an inclusive culture of open science and harness partnerships for innovation

OCSDO Enables Open Science

Each activity helps OCSDO achieve its goals of enabling Open Science for NASA.

DATA & COMPUTING SERVICES

Core Services for Science Discovery
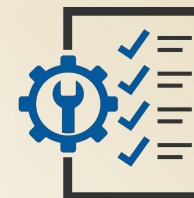*Developing* core data and computing services to enable open science

DATA SCIENCE/AI

Data Science and Artificial Intelligence
Implementing innovative data science tools, with a focus on inclusion and expanding the accessibility of scientific information
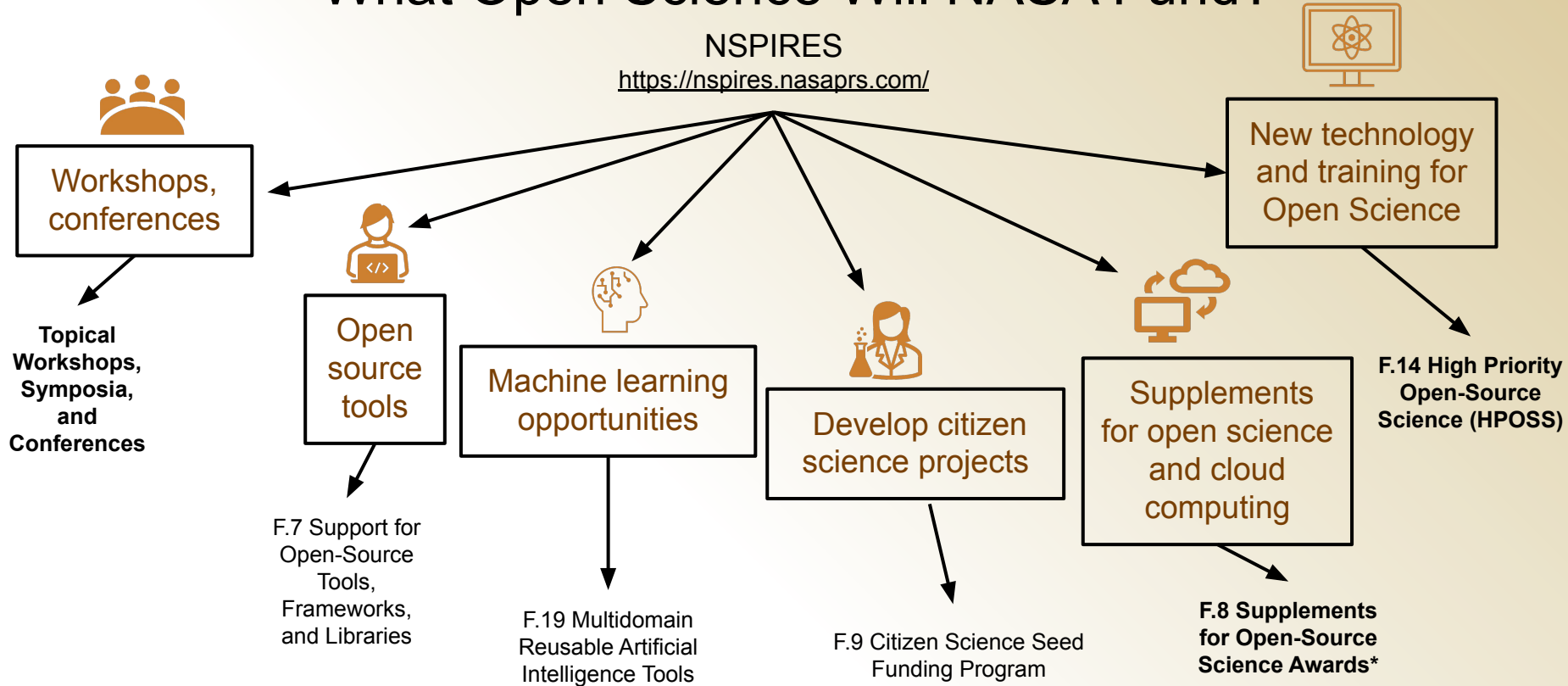
OPEN SCIENCE

Open Science implementation
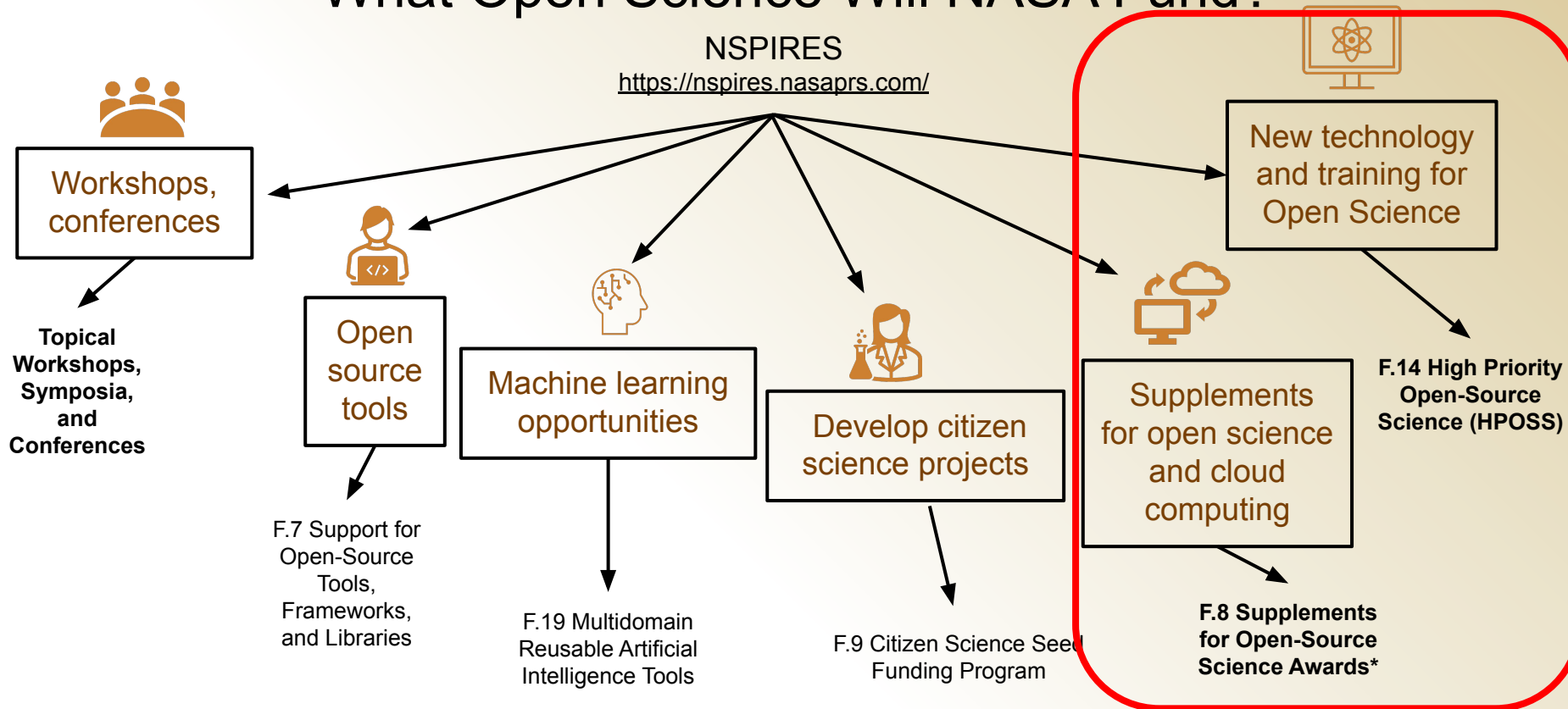*This includes Policy development, education, incentives, and advocacy on open source software*

What Open Science Will NASA Fund?

NSPIRES
https://nspires.nasaprs.com/

Workshops, conferences

Topical Workshops, Symposia, and Conferences

Open source tools

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

Machine learning opportunities

F.19 Multidomain Reusable Artificial Intelligence Tools

Develop citizen science projects

F.9 Citizen Science Seed Funding Program

Supplements for open science and cloud computing

F.8 Supplements for Open-Source Science Awards*

New technology and training for Open Science

F.14 High Priority Open-Source Science (HPOSS)

* Requires an existing NASA grant or facility.

Bold: No Due Date programs - always open

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F.14 High Priority Open-Source Science (HPOSS)

NSPIRES page

F.14 High Priority Open-Source Science: Program Scope

Supporting innovative work to make NASA science more transparent, accessible, inclusive, and reproducible

In ROSES-24, HPOSS supports proposals for two types of work:

Development of new technology, including innovative **open source tools, software, frameworks, data formats, or libraries** that will have a significant impact in the SMD science community.

Proposals should advance accessibility, inclusivity, or reproducibility in the areas of scientific data, software, or publications.

Same scope as ROSES-22/23 HPOSS

Development of capacity building materials to support the adoption of open science practices, including **curricula, tutorials, or other training materials**.

Must be appropriate for one of more science disciplines supported by SMD. Audience for materials may range from undergraduates to established scientists.

New in ROSES-24

F.14 HPOSS: Program Scope

- Proposals to HPOSS must align with the scientific goals of one or more SMD divisions
    - Discipline-specific proposals aligned with a single division are welcome.
    - Proposals that would advance open science across the SMD scientific community (aligning with two or more divisions) are also welcome and <u>may</u> be given priority.

- Proposals submitted to HPOSS must be for <u>new work</u> not currently supported by SMD.
    - Proposals may expand existing SMD-supported projects with the development of new technology to advance open science or open science capacity building materials, as long as the proposed activities are not currently supported by SMD.

- Proposals for projects related directly to answering a scientific question using new tools or software should be submitted to the relevant program within SMD divisions (e.g. D.2 Astrophysics Data Analysis or B.20 Heliophysics Tools and Methods).

F.14 HPOSS: Funding

- In ROSES-24, the total anticipated budget for F.14 HPOSS is $1,200,000.
- This is expected to support 8-12 selections, with a typical award size of $100,000.

F.14 HPOSS: Proposal Preparation

- This program has no fixed due dates.
  - Proposals for ROSES-24 may be submitted up until March 28, 2025.
  - Proposals will be reviewed on a rolling basis, with peer review panels held 3-4 times per year.

- Proposals must follow the ROSES-2024 Summary of Solicitation and the NASA Proposer's Guide.
- See additional HPOSS-specific instructions in section 4 of the solicitation.
  - The Science/Technical/Management section is limited to 5 pages.

- Proposals must be anonymized for Dual Anonymous Peer Review (DAPR).
  - Proposers are unaware of reviewer identity; reviewers evaluate anonymized proposals.
  - General SMD DAPR guidance
  - See HPOSS-specific DAPR instructions in section 4.5 of the solicitation.

F.14 HPOSS: Proposal Preparation

Proposals must include an **Open Science and Data Management Plan (OSDMP)**

- The OSDMP describes how the scientific information that will be produced from SMD-funded scientific activities will be managed and made openly available.
- This includes requirements for openly sharing scientific data, software, and publications, in accordance with *SPD-41a: Scientific Information Policy for the Science Mission Directorate*.
- Follow guidance on OSDMP preparation in the ROSES-2024 Summary of Solicitation.
  - For HPOSS, the OSDMP must include the **license(s)** with which materials will be shared and be **anonymized** for DAPR.
- Additional OSDMP Resources:
  - ROSES OSDMP Guidance
  - OSDMP templates are included in the SMD Open Source-Science Guidance
  - Transform to Open Science (TOPS) Open Science 101

F.14 HPOSS: Evaluation Criteria

Proposals will be evaluated on three criteria: **Merit, Relevance, and Cost**.
- See the NASA Proposer's Guide and ROSES Summary of Solicitation for details.

Additionally, proposals to HPOSS will be evaluated based on:
- The evaluation of Relevance will include alignment with the HPOSS programmatic themes identified in the solicitation or the NASA SMD Science Vision and Strategy for Data Management and Computing for Groundbreaking Science.
- The evaluation of Merit will include an assessment of impact in the scientific community. The relevant scientific community should be identified as part of the proposal.
- The evaluation of Merit will include the extent to which the proposers appropriately describe how project materials will be made openly available as part of the OSDMP.

F.14 HPOSS: Examples of Previous Awards

- ROSES-22
  - 8 selections made
  - Summaries of selected proposals available on NSPIRES under "Selections"

- ROSES-23
  - 2 selections made, with more to be announced soon.
  - Summaries of selected proposals will be posted on NSPIRES under "Selections"

F.8 Supplements for Open-Source Science (SOSS)

NSPIRES page

F.8 Supplement for Open-Source Science: Program Scope

Augmentation to existing ROSES awards to make NASA science more accessible, inclusive, and reproducible

Two types of proposals are welcome, both requiring an existing parent award:

Increase the accessibility, inclusivity, and reproducibility of the science from the parent award, and/or **contribute** back to the open-science communities relevant to the parent award. *Same scope as ROSES-22 SOSS*	Provide **cloud credits** to further support or expand the parent award. *New since ROSES-23*

- Awards to support work for one year (up to 3 years may be considered).
- Proposals will be reviewed on a rolling basis. Apply any time before March 28, 2025.

F.8 SOSS: Program Eligibility

To be eligible to propose to this program element, proposers external to NASA must have a research proposal that has been selected for funding through ROSES. Proposals with fewer than 6 months remaining or in the no cost extension phase may still be considered but proposers should confirm eligibility with the points of contact (POCs) in Section 6 of this program element prior to submission.

Projects funded by SMD directly through mechanisms other than ROSES at NASA Centers, other government agencies, or JPL may be considered under this program. Prior to submission, email the POCs in Section 6 to confirm relevancy and/or availability

F.8 SOSS: Proposal Preparation

- No more than **3 pages** 🥳
- Start with **a brief summary** of the scientific goals of the original proposal.
- Include a description of the open science activity to be undertaken and **the benefit to the community** of that activity.
- If applicable, **any updates** to the Data Management Plan or Open Science and Data Management Plan of the parent award. If updates are substantial, they may be included in a separate section of up to 2 pages.
- If the proposal **requests cloud credits**, the S/T/M (Science/Technical/Management) section should also include:
  - If the parent award was already cloud-based, explain **why the extra credits are required** and how they will expand or improve the project.
  - If the parent award wasn't cloud-based, explain **why it will be moved to the cloud** and how this will expand or improve the project, and provide a work plan for running the project in the cloud.
  - A summary of the PI's experience using cloud computing, or their plans to obtain training prior to the start of this award.

F.8 SOSS: Examples

Some proposal examples (not necessarily based on real proposals!):

- Converting existing scientific software into modern, open source code (e.g., IDL → Python).
- Publicly releasing a software package, with appropriate documentation, from previously closed source software.
- Making data produced or used in the parent award openly available and analysis-ready.
- Writing tutorials for techniques, code, and/or data resulting from the parent award that increase the accessibility or usability of the results.
- Contributing new functionality or optimizations developed through the parent award to community software packages (e.g., Numpy, Astropy).
- Requests for Amazon Web Services (AWS) credits to support activities from the parent award, or to provide cloud services for a workshop or hackathon supporting Open Science.

F.8 SOSS: Evaluation

Proposals will be evaluated on three criteria: **Intrinsic Merit, Relevance, and Cost**.

As part of the evaluation of **Intrinsic Merit**, reviewers will assess:

- The potential to **increase the accessibility, inclusivity, and reproducibility** of the science from the parent award, and/or to contribute back to the NASA-related open science communities.
- The **potential benefit of the open science activity** to the community and the reasonableness of the development plan in the proposal.

F.8 SOSS: Funding

The expected budget for the program is **$400k per year**, divided as follows:

- **For supplemental awards: ~5 awards per year** of typical size of ~$50k for one year. Total of $250K available per year for the program.
- **For clouse credits: 10–15 awards** of ~$10K per year.   Total of $150K available per year for the program.

Larger or longer awards may be considered, but please contact the POC prior to submitting.

F.8 SOSS: Previous Results

Year	Num. Proposals	Num. Awards
ROSES-23	38	*In progress…*
ROSES-22	6	5
ROSES-21	1	0
ROSES-20	6	6

Question & Answer

Question & Answer

Please submit your questions to: https://nasa.cnf.io/sessions/hk4n/#!/dashboard

Resources

NASA Open Science Funding Opportunities:
- F.14 High Priority Open-Source Science (HPOSS) NSPIRES page
- F.8 Supplement for Open Source Science (SOSS) NSPIRES page

General Resources for Proposers:
- NASA Proposer Guide
- SMD ROSES Overview

Open Science Resources:
- SMD Open Source-Science Guidance
- Transform to Open Science (TOPS) Open Science 101

Contact the Program Officers for F.14 and F.8: HQ-SMD-CSDO-ROSES@mail.nasa.gov

Backup Slides

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-2024 Summary of Solicitation for full details on eligibility.

Participation is **open to all categories of U.S. institutions** including:
- educational institutions
- industrial institutions
- for-profit, and not-for-profit organizations
- Federally Funded Research and Development Centers (FFRDCs)
- University Affiliated Research Centers (UARCs)
- NASA Centers (including JPL)
- other US 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 research 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.

Eligibility of Funding for Foreign Non-Research Activities

NASA funding may not be used for subcontracted foreign research efforts, including travel. The direct purchase of supplies and/or services, which do not constitute research, from non-U.S. sources by U.S. award recipients is permitted.

SMD views software engineering activities as a service and not research. Thus, maintenance, bug fixes, documentation, code review, software infrastructure, and user support would be considered services. However, SMD views efforts related to design, writing specifications, or creating new algorithms as research. Final decisions about the appropriate use of the funds for non-U.S. sources will only be made by the Grant Officer on review of the accepted proposal.

For more information on foreign participation including restrictions involving China, see Section III.c of the *ROSES Summary of Solicitation*.

Additional Opportunities for funding

The transformation of legacy software may be supported under the F.8 Supplements for Open-Source Science or the F.14 High Priority Open-Source Science.

Development of new tools may be supported under existing division program elements
- D.2 Astrophysics Data Analysis,
- C.4 Planetary Data Archiving, Restoration and Tools, or
- B.20 Heliophysics Tools and Methods)
- F.14 High Priority Open-Source Science program element.

Software may also be proposed as an element to existing science solicitations.

ROSES F.7 Open Source Tools, Frameworks, & Libraries

*Support for existing **o**pen-source **s**oftware **t**ools, **f**rameworks, and **l**ibraries (**OSTFL**) that have significant usage in the NASA science community.*

In ROSES-24, proposals should be one of two types:

| Foundational Awards	Sustainment Awards
Open source software tools, frameworks, and/or libraries that have a significant impact on two or more divisions of the SMD. These projects have significant usage by NASA missions, centers, repositories, and/or community. *Cooperative agreements. Up to 5 years.*	Open source software tools, frameworks, and/or libraries that have significant impact in one or more divisions of the SMD. *Grants or cooperative agreements. Up to 3 years.*

Anticipating 3-5 foundational awards, 8-10 sustainment awards. Total budget ~$4M/year. Notice of intent (NOI) due date May 3, 2024. Proposal due date June 7, 2024.

NSPIRES page | NASA Open Science Funding Opportunities

NASA's Transform to Open Science (TOPS)

A 5-year mission to accelerate adoption of open science
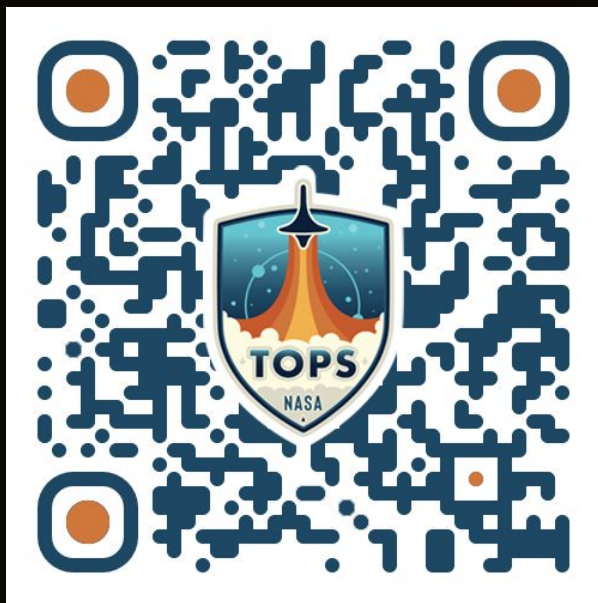
Goals:

- Increase understanding and adoption of open science principles and techniques
- Broaden participation by historically excluded communities
- Accelerate scientific discovery

Open Science 101

A community-developed introduction to **core open science skills**

https://nasa.github.io/Transform-to-Open-Science/