National Aeronautics and Space Administration

17 January 2023 Town Hall

Scientific Information Policy for the Science Mission Directorate (SPD-41a)

NASA Science Mission Directorate (SMD)

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Dr. Cerese Albers | Earth Science Division
Dr. Matthew McClure | Heliophysics Division
Dr. Meagan Thompson | Planetary Science Division
Cynthia Hall | TOPS Community Engagement

How to Participate in Today's Town Hall

- We are recording today's event. The slides and presentation recording will be posted on the Scientific Information Policy Website.
- Attendees are muted in today's call. Please submit your questions here: https://nasa.cnf.io/sessions/tgn4/#!/dashboard
- Questions from today's event will be added to our Frequently Asked Questions page

Agenda

- Overview and Motivation for SPD-41a
- Policy Requirements
- SMD Division Policies and Guidance
- Resources for Implementation
- Question & Answer

SPD-41a Overview and Motivation

SPD-41a is SMD's updated Scientific Information Policy.

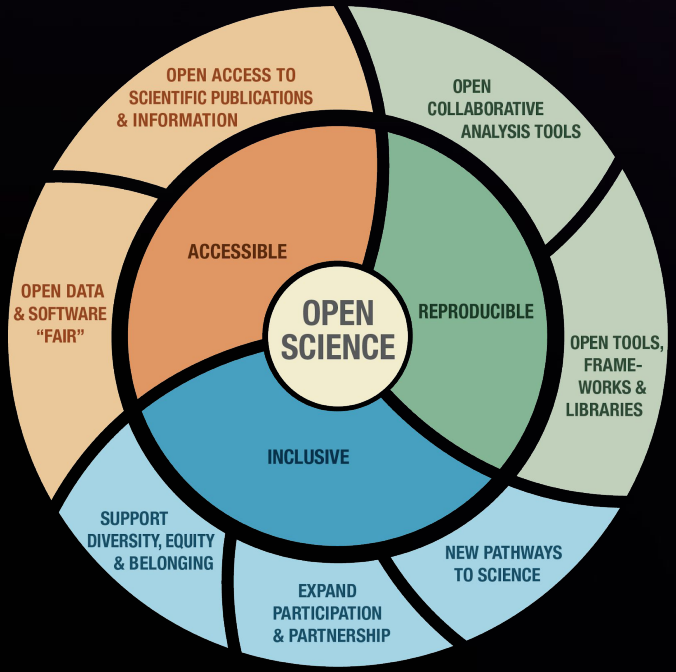
- SPD-41a updates the previously released SPD-41, which consolidated existing Federal and NASA policy on sharing scientific information.

- Policy updates were developed with:
  - Science Mission Directorate (SMD) community input via workshops and RFIs
    - Input from our data repositories and missions
  - National Academies studies
  - White House OSTP Memo on Ensuring Free, Immediate, and Equitable Access to Federally Funded Research

- One component of NASA's Open-Source Science Initiative (OSSI)

Scientific Information Policy Website

SPD-41a is built on the Open-Source Science Principles of Accessibility, Reproducibility, and Inclusion.



SPD-41a aims to make SMD science as open as possible, as restricted as required, and always secure.

SPD-41a looks to maximize openness while minimizing the burden on researchers.

SPD-41a Policy Requirements

SPD-41a is a forward-looking policy.

- Updated policy requirements will apply to all future SMD-funded scientific activities, including:
  - New grants, starting with ROSES-2023 (to be released in Feb. 2023)
  - New missions that have not yet reached Key Decision Point B by March 2023

- Existing grants and missions are not required to adopt new guidance, but they are encouraged to do so if feasible with available resources.

New in SPD-41a

Policy Highlights: Publications

- All SMD-funded publications shall be made publicly accessible.
  - As-accepted, peer-reviewed manuscripts shall be deposited in a NASA-designated repository and made freely available *with no embargo after the publication date*.
- SMD-funded publications describing Missions shall be made publicly accessible via a NASA-designated repository at the time of their publication.
- Reasonable costs for open access publications are allowed budgetary expense and SMD encourages posting manuscripts as preprints.

New in SPD-41a

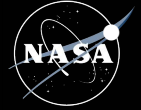
Policy Highlights: Data

- Scientific data underlying peer-reviewed manuscripts shall be made publicly available no later than the publication of the peer-reviewed article.
  - *Scientifically useful data associated with a research award shall be made publicly available no later than the end of the award.*
- *Scientific data should be findable, accessible, interoperable, and reusable (following FAIR principles),* shall be made reusable with a clear, open, and accessible data license*, and shall be citable with a persistent identifier.*
- Mission data shall be openly available with no period of exclusive access.
  - The period for data calibration and validation shall be as short as possible and shall not exceed six months.
- All SMD-funded scientific activities shall include a data management plan.

New in SPD-41a

Policy Highlights: Software

- *Research software:*
  - *shall be shared no later than the time of publication or the end of the funding award*
  - *should be assigned a permissive software license*
  - *shall be citable using a persistent identifier*
- *Mission software shall be developed openly in a publicly accessible, version-controlled platform that allows for contributions and engagement from the community.*
- *All SMD-funded scientific activities shall include a software management plan.*



Policy Highlights: Additional Updates in SPD-41a

- SMD-funded investigators shall have a persistent identifier (*e.g.*, ORCID).
- Publications produced for SMD-funded scientific events and presentations shall be made publicly accessible.
- During SMD proposal reviews, peer reviewed data and software shall be recognized as having the commensurate value as peer reviewed manuscripts.
- SMD shall provide a persistent identifier for all funding mechanisms and missions.
- SMD should foster and encourage contributions and engagement with communities and organizations setting standards and best practices.

SMD Division Policies and Guidance

Astrophysics Scientific Information Management Policy

Astrophysics is finalizing its own Science Information Policy that aligns with SPD-41a and is tailored to our community

- Our credo continues to be “do no harm, enable, and incentivize”
- Compliance applies to scientifically useful publications, data, and software
- Each SMD division defines or provides guidance for what is “scientifically useful” for their communities
- Our policy has been developed using the input we have received from the community through RFIs, AAS splinter sessions, and the Astrophysics archives
- PIs can describe what scientific utility is via their data management plans
- Astrophysics will cover cost of compliance
- PI should propose to cover cost of their compliance

Biological and Physical Sciences Division BPS-021

BPS Scientific Data Management Policy (BPS-021)
https://science.nasa.gov/biological-physical/data

BPS-021 addresses four groups:

1. **Programs and Portfolios;**
2. **Projects;**
3. **Investigators;**
4. **Repositories**

APPLICABILITY: **Research Data**: Funded by NRAs and ROSES. **Operations Data**: e.g. environmental data from flight and ground-control analogs, animal husbandry data from flight and ground, and logs of flight operations activities…

Software: Investigation tools or products developed with BPS funding required to reproduce results, **should be open-source**

General Guidelines

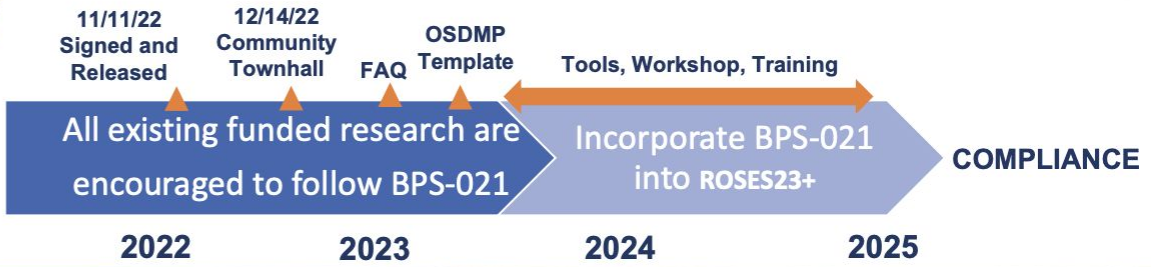
- **Research data and software** shall become publicly available no later than the publication of the investigation results.
- Any data not used to support publication must be submitted by end of period of performance (grant). No-costs extension on grants may be requested.
- **Operations data**: BPS shall commit to full, open and immediate sharing of information produced by BPS Mission Projects.

Additional Guidelines for BPS Funded Investigators:

- Complete a Research Data Submission Agreement (RDSA).
- Must have a PI unique identifier, for example ORCID
- Are urged to submit data throughout grant.
- Submit all data to designated BPS Open Science Data Repository (OSDR)
- Investigators sponsored with BPS funding shall publish any public presentations through a designated NASA repository.

Additional Guidelines for BPS Open Science Data Repositories (OSDR):

- Shall commit to the full and open publication of **scientific data** by **authorized release date**.
- Shall provide guidance and tools to assure timely and ongoing delivery of research and operations data. This includes a **private workspace, Data Management Plan and Data Submission Tools.**
- Shall release **operations data as soon as they are received and verified**, as stated in the Data Transfer Agreement.



Earth Science Division: Open Data, Services, & Software Policies

Committed to advancing Open Source Science in Research, Applications, Data, and Missions

ESD Data and Information Policy

- Full, free, and open data policy for all since 1994.
- Already consistent with SPD-41a principles.
  - Updates to clarify responsibilities for ESD, repositories, researchers, and missions coming Spring 2023.
  - Dedicated webpage for Data Management Guidance for ESD-funded Researchers coming Feb. 2023.

ESD Open Source Software Policy

- All software developed through research and technology awards (e.g. ROSES) shall be made available to the public as open source software.
  - Updates to align with SPD-41a coming Feb. 2023

Across 2023 additional policy and guidance updates will further align with SPD-41a: Open Science and Data Management Plans (OSDMP), ESDS Standards and Practices, Data Use Policy, Adding New Data to ESDS…

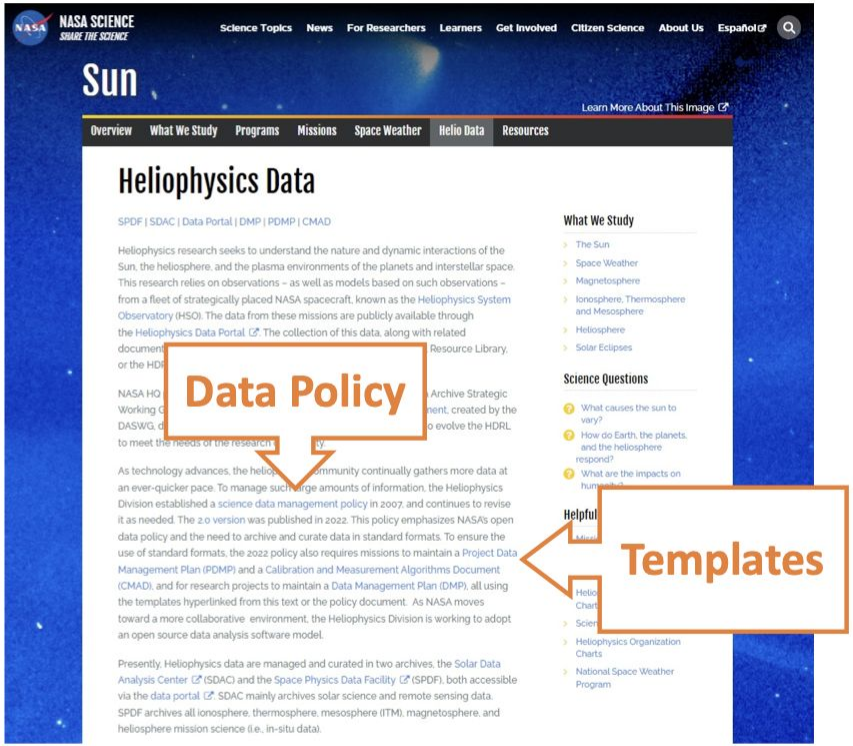
https://www.earthdata.nasa.gov/engage/open-data-services-and-software

Heliophysics Scientific Data Management Policy

Heliophysics benefits from the contributions of the open science **community** and is committed to promoting open science across its funded activities.

Heliophysics data priorities:

1. Make high-quality data publicly available as soon as practical
2. Prescribe full and open sharing of Heliophysics Division funded software under community accepted and broadly permissive license
3. Encourage adherence to FAIR Guiding Principles for scientific data management and stewardship
4. Facilitate long-term curation of HPD-funded data



https://science.nasa.gov/heliophysics/heliophysics-data

Planetary Information & Data Management Policy

The Planetary Science Division is finalizing its own Information and Data Management Policy that aligns with SPD-41a and provides implementation guidance to the community.

- Relies heavily on Open Science and Data Management Plans to identify data, software, publications, and physical samples to which SPD-41a applies
- Provides guidance on implementation of SPD-41a, as applied to Planetary Science Division activities
- Uses input received from the community through PDE IRB, RFIs, PDE community members and its archives/repositories — Thank you for your continued feedback!
- PIs can describe what “scientific utility” is via their Open Science and Data Management Plans, which are evaluated through the peer review process
- Planetary encourages PIs to be realistic in cost of compliance, which is allowable costs associated with a funded activity, as consistent with proposed Open Science and Data Management Plans

Coming soon: Planetary Data Officer
https://science.nasa.gov/solar-system/planetary-data-overview

Open Science and Data Management Plan

Future proposals should contain an Open Source and Data Management Plan. This will include how data, software, and publications will be shared openly along with other open science activities of the proposals.

The costs for the activities described in the OSDMP should be included in the proposal budget. SMD *will support* reasonable costs associated with Open Science for future awards.

Resources for Implementation

SPD-41a aims to maximize openness while minimizing burden on SMD-funded missions and researchers.

Support from NASA's Open-Source Science Initiative includes:

Open-Source Science Guidance for SMD-funded researchers

Scientific Information Policy FAQ

Outreach and Training: Transform to Open Science

Infrastructure: core services for cataloging, search and discovery, and computing

Funding opportunities to support the adoption of open-source science practices

All resources are linked on the Scientific Information Policy Website

Open-Source Science Guidance

- Narrative guidance on how to comply with SPD-41a
- Broad guidance, for relevance across SMD Divisions
- Living document to be developed over time
- Includes:
  - Background and Motivation
  - Open Science and Data Management Plan
  - Sharing Publications
  - Data Management and Sharing
  - Software Management and Sharing
  - Sharing Materials for Science Events
  - Glossary of Open-Source Science Terms

Frequently Asked Questions

FAQ for SMD Information policy

< Back to Science Information Policy

Updated: December 8, 2022

FAQs on SPD-41a

General Information | Publications | Data | Software

General Information

Q. When did SPD-41a come into effect? Does it impact current, SMD-funded research?

A. SPD-41a is effective as of December 2, 2022. New missions and awards, starting with ROSES-2023, will be expected to fully comply with SPD-41a. These requirements will be introduced into new solicitations, contracts, and agreements as appropriate. Existing missions and grants are not required to adopt new guidance, but they are encouraged to do so if feasible with available resources.

Q. How do the requirements in SPD-41a differ from those already in place under SPD-41?

A. The major policy updates in SPD-41a concern the timeline for providing public access to publications, sharing research software produced from SMD funding, the open development of unrestricted mission software, and holding science workshops and meetings openly.

Both resources are linked on the Scientific Information Policy 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

Open-Source Science Funding 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.

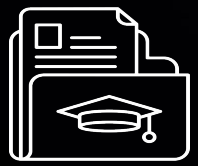
NASA Transform to Open Science (TOPS)

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

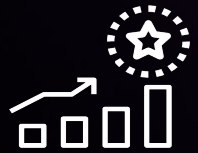
Strategic Goals:

- 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

Coordination

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

Why get a NASA Open Science certification?

Designed to provide researchers with **core open science skills:**

- Create the digital tools to perform open science (e.g., Github account and ORCID)
- Become aware of data management and software management plan best practices and resources
- Grow connections across a community of open science practitioners

*A **community developed** introduction to open science with inclusivity, accessibility, and diversity at the forefront.*

Enroll here:

The White House announces The Federal Year of Open Science

NASA ✦ NSF ✦ NOAA ✦ DOA ✦ DOC ✦ DOE ✦ GSA ✦ NEH ✦ NIH ✦ NIST ✦ USDA ✦ USGS

Along with other organizations, including CENDI group, voluntary collaboration among Federal managers, and HELIOS, a coalition of 80+ universities

A multi-agency initiative across the federal government to spark change and inspire open science engagement through events and activities that will advance adoption of open science.

Learn more at: https://open.science.gov/

2023 is NASA's Year of Open Science

TOPS Priorities:

1. Release an introduction to open science curriculum, OpenCore
2. Engage with historically underrepresented groups
3. Develop open science incentives

To hear more sign up for the TOPS email list!

Upcoming SMD Community Events

- SMD Quarterly Community Town Hall - January 18, 2023, 4:00-5:00 pm ET
- Information Session on ROSES F.15 High Priority Open-Source Science - January 19, 2023, 1:00-2:00 pm ET
- Town Hall on Request for Information: Scientific Data and Computing Architecture to Support Open Science - January 26, 2023, 1:00-2:00 pm ET

Question and Answer

Submit questions here:

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

Additional questions or comments?

Ask your Program Officer or email

HQ-SMD-SPD41@list.nasa.gov