National Aeronautics and
Space Administration

NASA Science Mission Directorate Information Policy

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Strategy for Data and Computing for Groundbreaking Science 2019-2024

Vision: To enable transformational open science through continuous evolution of science data and computing systems for NASA's Science Mission Directorate.

Mission: Lead an innovative and sustainable program supporting NASA's unique science missions with academic, international and commercial partners to enable groundbreaking discoveries with open science data. Continually evolve systems to ensure they are usable and support the latest analysis techniques while protecting scientific integrity.

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
Strategy 1.1: Develop and implement a consistent open data and software policy tailored for SMD	**Strategy 2.1**: Establish standardized approaches for all new missions and sponsored research that encourage the adoption of advanced techniques	**Strategy 3.1:** Develop community of practice and standards group
Strategy 1.2: Upgrade capabilities at existing archives to support machine readable data access using open formats and data services	**Strategy 2.2**: Integrate investment decisions in High-End Computing with the strategic needs of the research communities	**Strategy 3.2:** Partner with academic, commercial, governmental and international organizations
Strategy 1.3: Develop and implement a SMD data catalog to support discovery and access to complex scientific data across divisions	**Strategy 2.3**: Invest in capabilities to use commercial cloud environments for open science	**Strategy 3.3:** Promote opportunities for continuous learning as the field evolves through collaboration
Strategy 1.4: Increase transparency into how science data are being used through a free and open unified journal server	**Strategy 2.4**: Invest in the tools and training necessary to enable breakthrough science through application of AI/ML	

Strategy for Data and Computing for Groundbreaking Science 2019-2024

Why a scientific information policy?

The information produced as part of NASA's scientific research activities represent a significant public investment. NASA holds this information as a public trust to increase knowledge and serve the public good.

Types of information

- Publications (peer reviewed, conference presentations, technical reports)
- Data (scientific and engineering)
- Software (scientific and operations)

Benefits of an information policy:

- Need to make sure that information produced by NASA SMD funding is shared openly and widely to maximize benefit and reach of the of the information
- Policy also helps consolidate a wide range of applicable laws, guidance, and policies
- Provides clear and transparent policy for our program officers, scientists, and communities.
- Helps provide support for open science

Why support Open Science?

- Helps produce science that is more reproducible
- Increases transparency to the scientific process
- Increases the accessibility by lowering barriers through openly sharing of knowledge
- Increases efficiency
- Enables new science that was not originally envisioned
- Improves the quality of the science
- Compliance with Federal guidance

Core Values in the Development of the policy

- Maximize the openness of scientific information produced by NASA SMD funding
- Preserve the scientific information produced by NASA SMD funding
- Support the community in accessing the information that they want
- Minimize the burden in complying with the policy

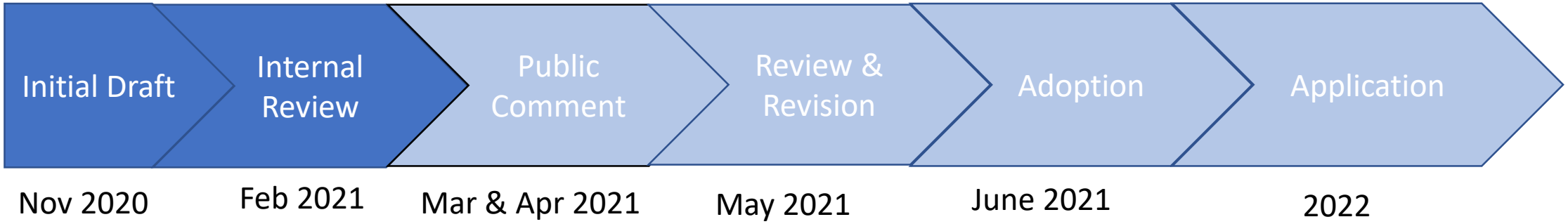
Development of the Policy

There are already a significant number of NASA policies, government directives, and laws that govern the availability of the information that NASA produces.

- Federal laws such as the Open Data Act and America Competes
- Federal Guidance on open data, open source software, and publications
- NASA policies
- National Academy studies such as *Open source software policy options for NASA Earth and Space Sciences*
- Recommendations and requirements from professional societies and journals
- Community best practices

This policy tries to consolidate this information and provide direction that is relevant to NASA SMD. References to the policies and documents used are provided at the end.

Schedule for the policy development



The schedule though is consensus driven and these dates should be viewed as targets and not deadlines. The schedule will shift to give appropriate time for discussion and comment.

- Approval of the policy will occur no earlier than June 2021.
- If adopted, policy will be in place for ROSES and AO calls in 2022.
  - Some requirements already apply.
  - Some solicitations may adopt parts of the policy earlier.
  - Existing Missions and Researchers should adopt the policy as their resources allow.
- Except for variances, researchers funded from ROSES22 will need to be compliant.
  - Funded projects will typically start in 2023.
  - Funded publications will typically be produced in 2024.

Scientific Information Policy

The information policy has the following sections:

I. Background

II. Applicability: Except for those covered by other laws, this policy applies to all SMD funded activities.

III. General: The policies that apply to all applicable activities.

IV. Missions: Policies or deviations applicable to information to our Strategic or Flagship missions.

V. Research: Policies or deviations applicable to information produced by our Research Activities

VI. Other Activities: Additional policies for SMD activities including citizen science and conferences

VII. Variances: Process for handling variances to the policy and also indicating that each division can be more open

VIII. Measurement and verification

IX. Appendix: The appendix includes definitions and additional material may be added

PubSpace and a New External Portal

RESEARCH ACCESS

What's Happening?

Submission Portal: A new submission portal is being developed for NASA funded external users (grantees/coop agreements holders/contractors) for Accepted Manuscripts and other Scientific and Technical Information (STI) products.

- Those who currently submit through National Institutes of Health Manuscript Submission (NIHMS) System will submit directly to the STI Program Office
- Login options for the portal will authentic via NASA Launchpad, ORCID, and/or guest.nasa.gov
- The new portal will leverage Persistent Identifiers (PIDs) and funding information
- Target completion date is June 2021

PubSpace: A new PubSpace environment will be created in the STI Repository

- Currently PubSpace is a subcollection in PubMed Central (PMC)
- Hosting PubSpace in the STI Repository provides greater opportunity to capture content from multiple sources through the external submission portal, legacy STI content, and PMC. Investigating further integration with CHORUS and other Open Access sources

More information and updates will be provided at https://sti.nasa.gov/submit-to-pubspace

Public Comment on the Policy

- The policy will be made available for public comment. In addition to the policy, we will also provide a more extensive explanation of the policy along with Frequently Asked Questions to provide more insight into the motivation of the policy.
- We would very much appreciate feedback from APAC on the policy.
- This could include on specific aspects of the policy or what aspects will need further support from APD to help the community be compliant.

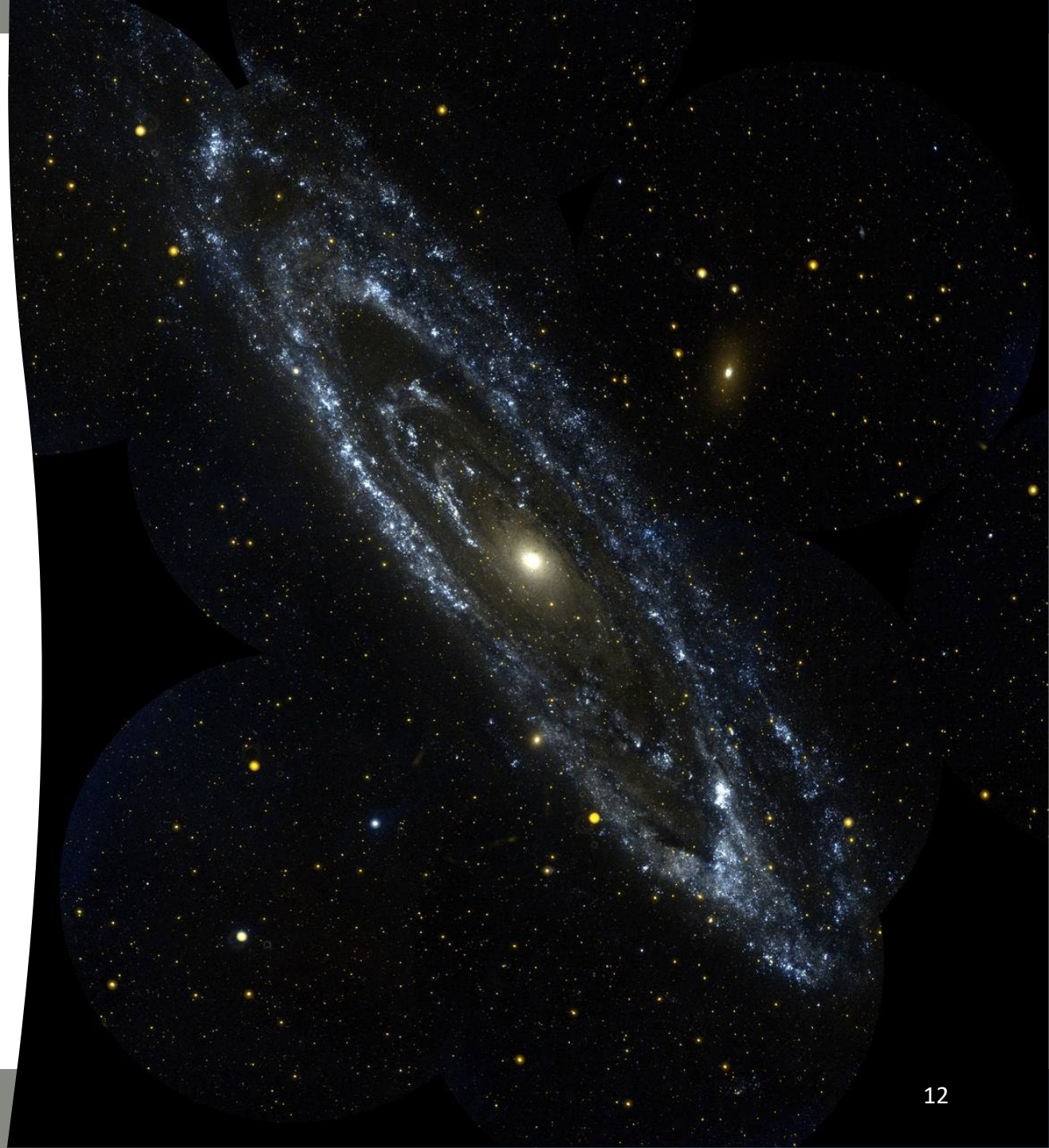
Next Steps for the policy

The development of the policy is only an early step in the *Strategy for Data and Computing* that will take place over the next 3-5 years. Future steps include:

1. Reviewing comments and feedback from the community and assessing the impact of the policy.
2. Engagement and training for the community.
3. Updating existing guidance, solicitations, and information with respect to the policy.
4. Each division creating their own guidance in line with the SMD policy but addressing the needs of their specific community.
5. Defining further resources that can be used by the community such as appropriate repositories
6. Developing tools and partnering with existing services to streamline processes
7. Providing support for the implementation of the policy
8. Providing recognition for open science champions in the community

AAS Splinter Session

- **Session Title:** The New NASA Science Mission Directorate Scientific Information Policy
- **Date:** 6/9/2021
- **Time:** 12:00:00 PM - 1:30:00 PM
- **Time Zone:** Eastern
- **Session Duration:** 90 minutes



Back up material

References

NASA Policies

NPD 2200.1 Management of NASA Scientific and Technical Information

NPR 2200.2 Requirements for Documentation, Approval and Dissemination of Scientific and Technical Information

NPR 2210.1 Release of NASA Software

NPD 2230.1 Research Data and Publication Access

Acts

OPEN Government Data Act, as part of the Foundations for Evidence Based Policymaking Act

American Innovation and Competitiveness Act

Memorandum and Government Directives

M-13-13: Open Data Policy-Managing Information as an Asset

OSTP Increasing Access to the Results of Federally Funded Research

Executive Order 13642: Making Open and Machine Readable the New Default for Government Information,

OMB M-16-21: Federal Source Code Policy: Achieving Efficiency, Transparency, and Innovation through Reusable and Open Source Software

OMB A-130: Managing Information as a Strategic Resource

Section 508 IT Accessibility

Resources for open data: https://resources.data.gov

Reports

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

NASA SMD Archives Processing and Data Exploitation Summary Report

NASA SMD Maximizing the Scientific Return of NASA Data Workshop Report

Open source software policy options for NASA Earth and Space Sciences

Open Science by Design

References

Community Standards

FAIR

Open Source Initiative

Science Journal open source policy

Nature open source policy

AGU Data policy

American Astronomical Society

Data Guidelines

AAS Software policy

Existing SMD policies

Earth Science

https://science.nasa.gov/earth-science/earth-science-data/data-information-policy

https://earthdata.nasa.gov/collaborate/open-data-services-and-software/esds-open-source-policy

Heliophysics

https://hpde.gsfc.nasa.gov/Heliophysics_Data_Policy_v1.2_2016Oct04_signed.pdf

Planetary Data:

https://pds.nasa.gov/datastandards/about/

Citizen Science

https://science.nasa.gov/science-red/s3fs-public/atoms/files/SPD-33-Signed.pdf