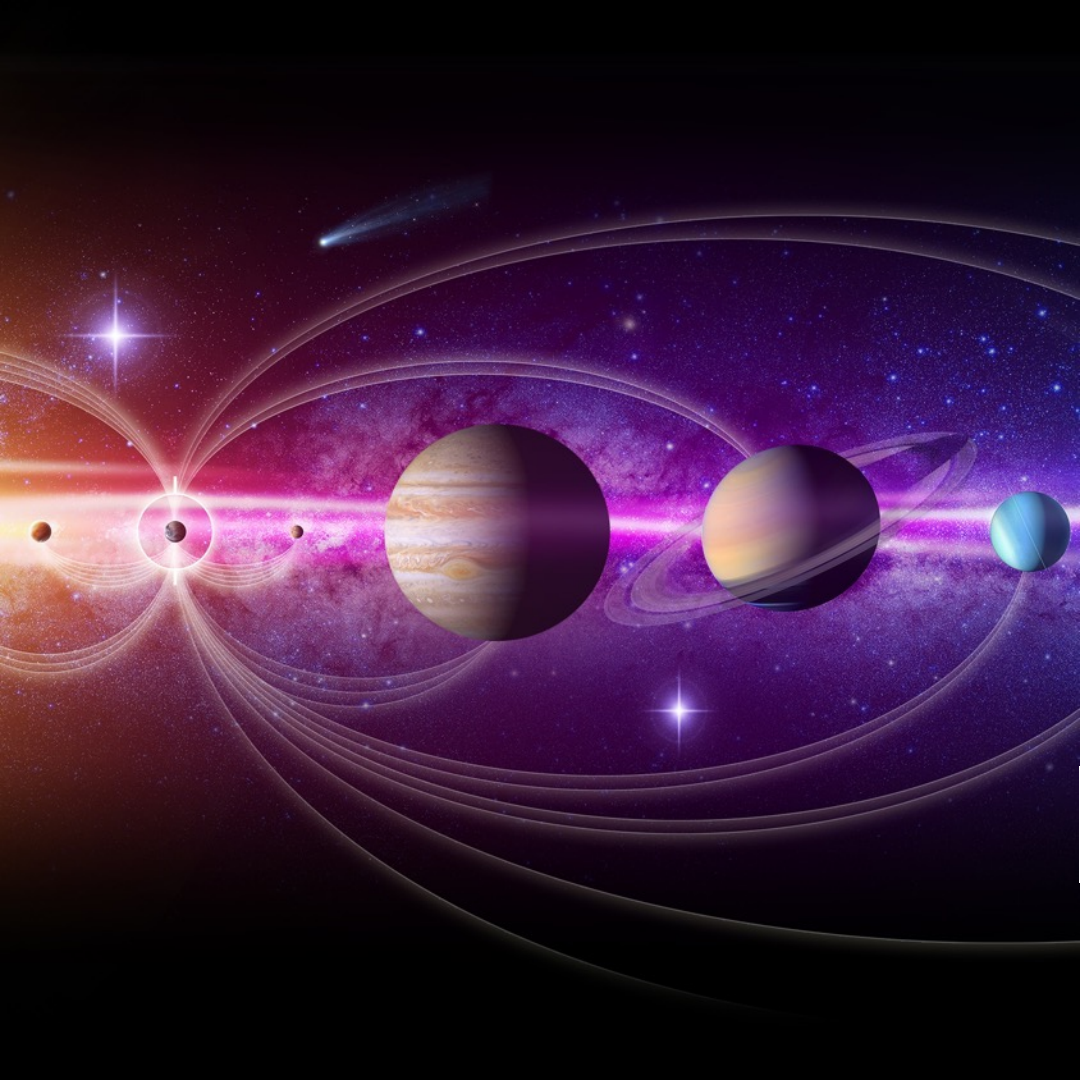

Out In The Open: How the JPL Library is Leading Open Science

SCALE 20X

March 12, 2023

Caroline Coward, Library Group Supervisor
Enterprise & Information Systems Engineering Section

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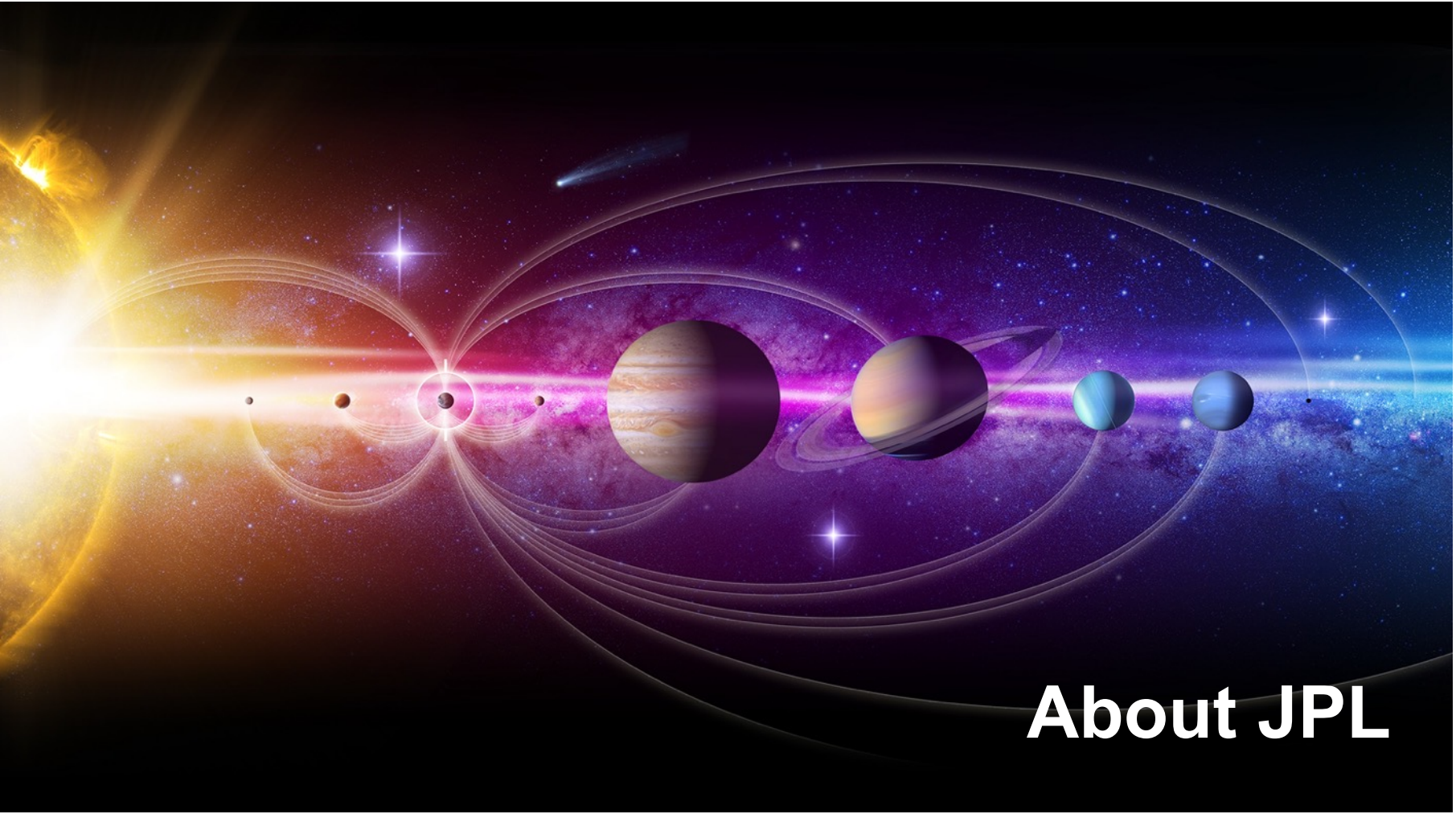
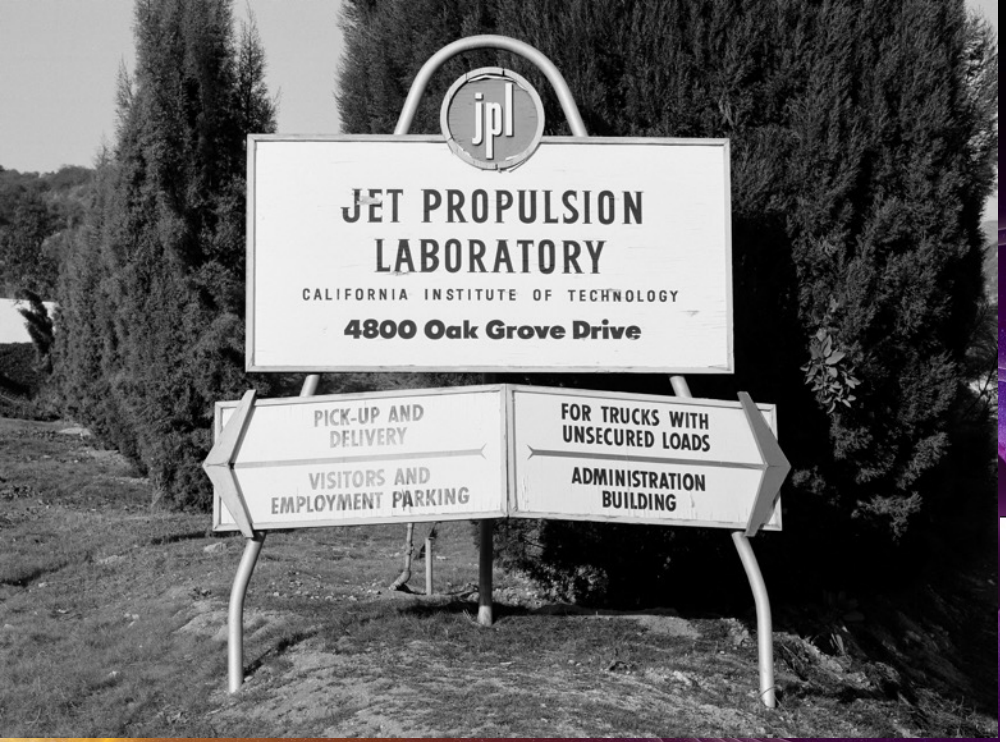
Jet Propulsion Laboratory
California Institute of Technology

In Brief…

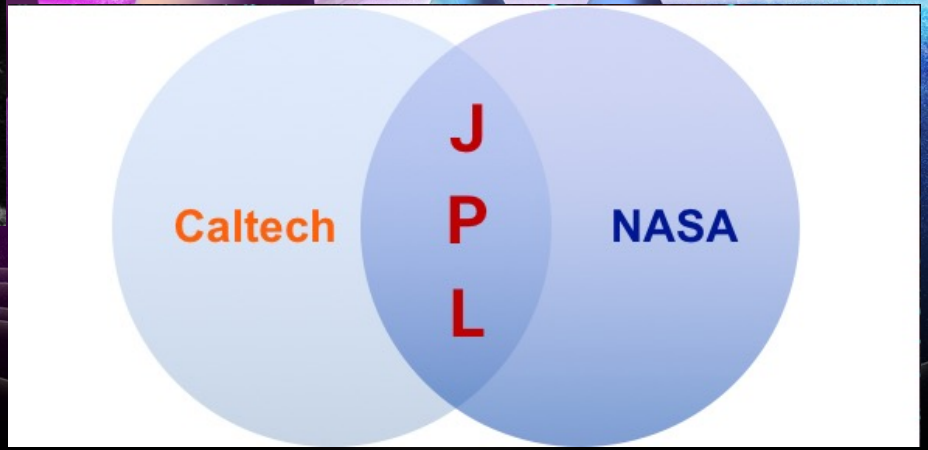
- ✓ Why Open Science?
- ✓ Open and FAIR initiatives
- ✓ Data science activities and partnerships
- ✓ Open Access
- ✓ Knowledge Office/Office Of the Chief Engineer partnership
- ✓ Data Citation Community of Practice
- ✓ NASA's Ethical AI initiative
- ✓ Open Science session at the American Geophysical Union 2021 Fall Meeting



About JPL



- Founded in 1936
- Army years 1943-1957
- NASA 1958-present



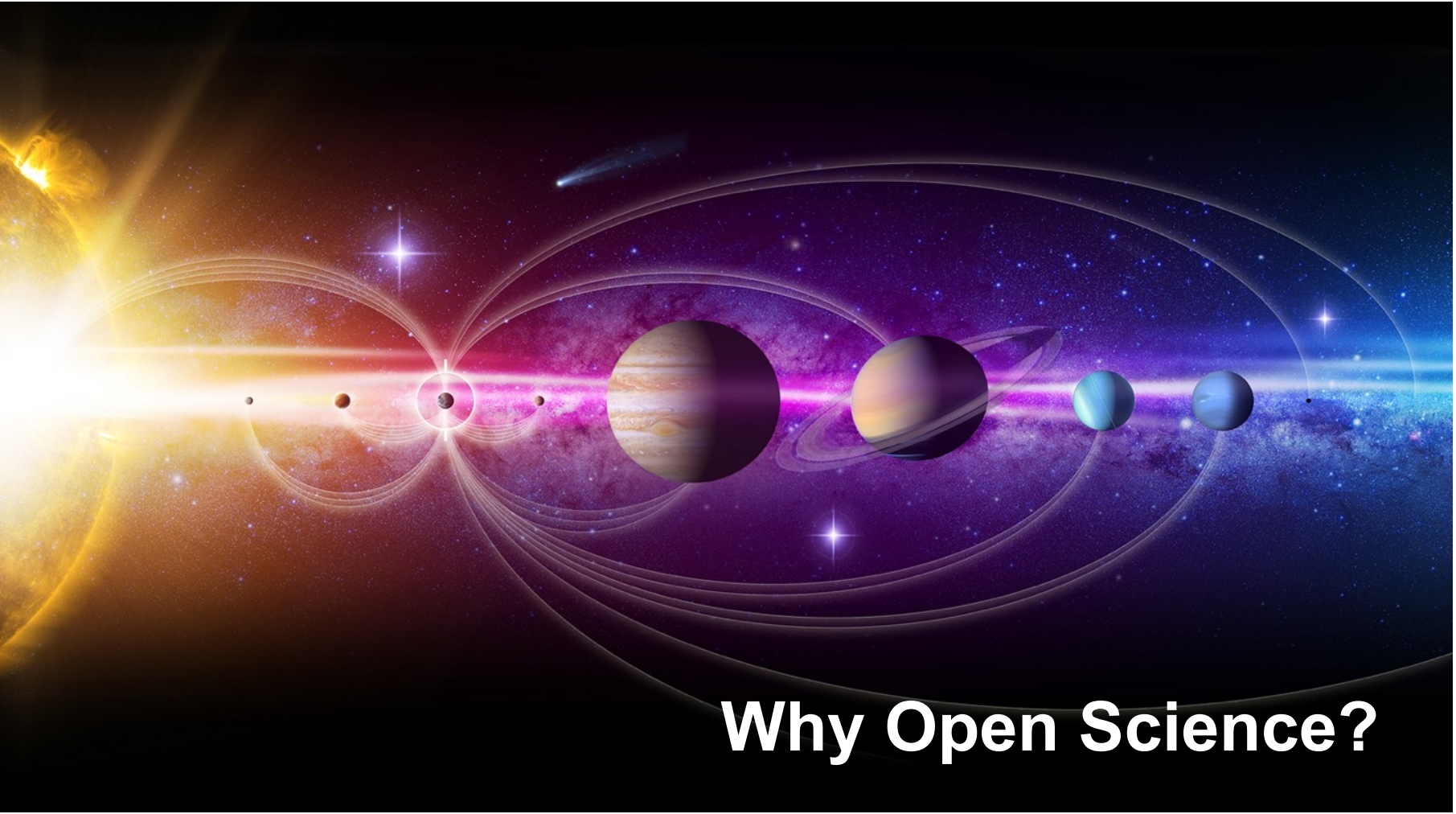
NASA's Only FFRDC

By Way Of Introduction…

- MLIS SJSU 1997
- Bachelor of Music – cello performance
- Over 30 years working in all types of libraries –
  - USC
  - PCC
  - 20th Century Fox Studios
  - Sierra Madre PL
  - CSU Dominguez Hills
- Earned tenure as university faculty
- Information Literacy Coordinator in higher ed for 15yrs
- Jet Propulsion Laboratory since 2017

Image: Jeff Broude, 2004

Image: Jeff Broude, 2009



Why Open Science?

Why Open Science?

*"Open science is an essential part of the Biden-Harris administration's broader commitment to **providing public access** to the nation's taxpayer-supported research and innovation enterprise."*

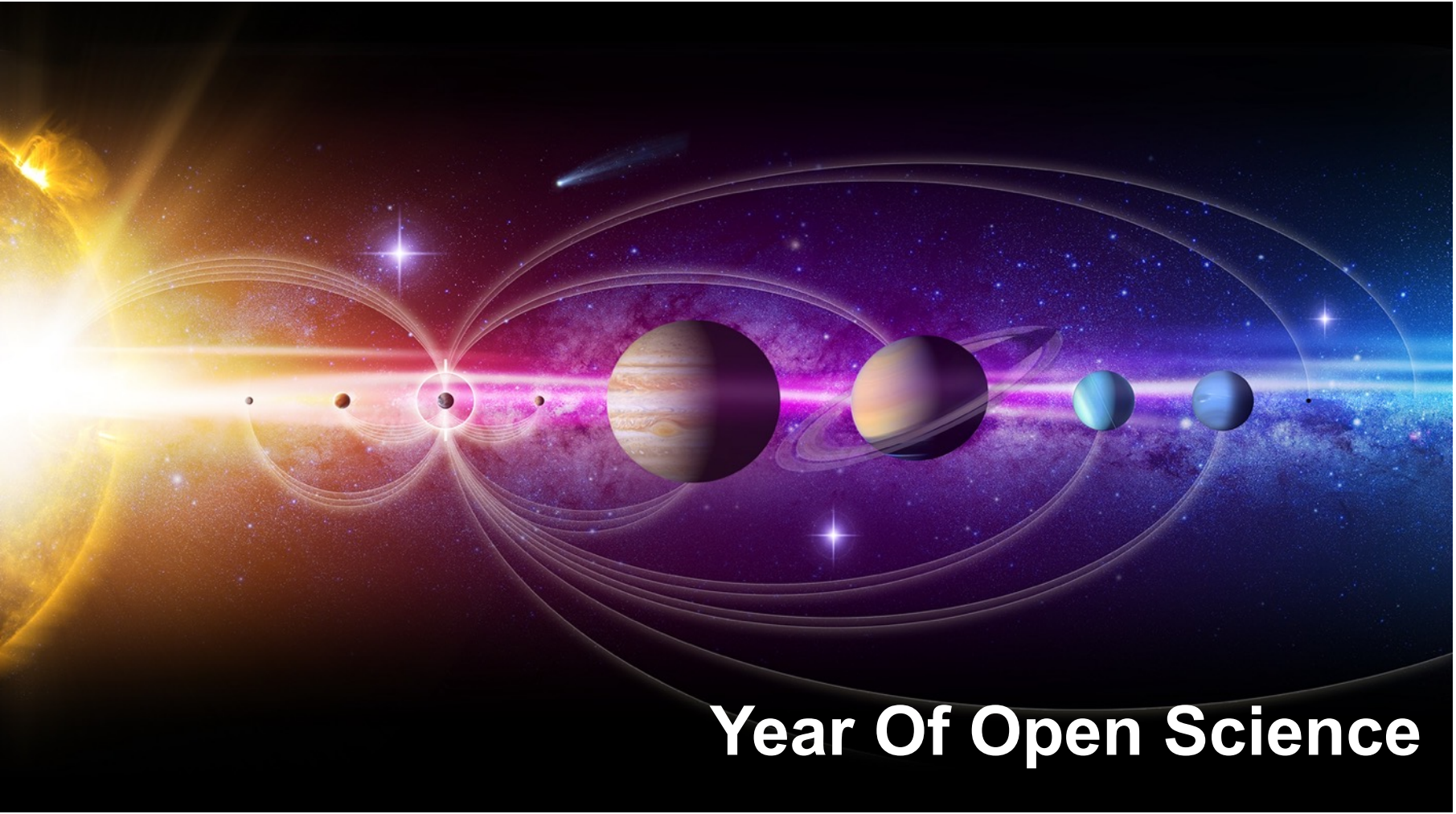
SMD Open-Source Science Initiative

- *Transparent, Accessible, Inclusive, Reproducible*
- *"Open-source science requires a **culture shift** to a more inclusive, transparent, and collaborative scientific process, which will increase the **pace and quality** of scientific progress."*

TOPS – Transform To Open Science community building effort

American Geophysical Union (AGU) statement

- *"Scientists, Policy Makers, and Supporting Institutions Should Guard and Promote **Unfettered Communication** of Scientific Data, Debates, and Findings as a Component of Scientific Expression."*


Year Of Open Science

2023 is the Year Of Open Science…

- Open science announcements across federal agencies
- Why NASA and federal agencies are declaring this the Year of Open Science
- Year Of Open Science across federal agencies
- NASA TOPS Guide to the Year Of Open Science
- SPD-41 and SPD-41a

Open and FAIR Initiatives

Open and FAIR…

Open Access

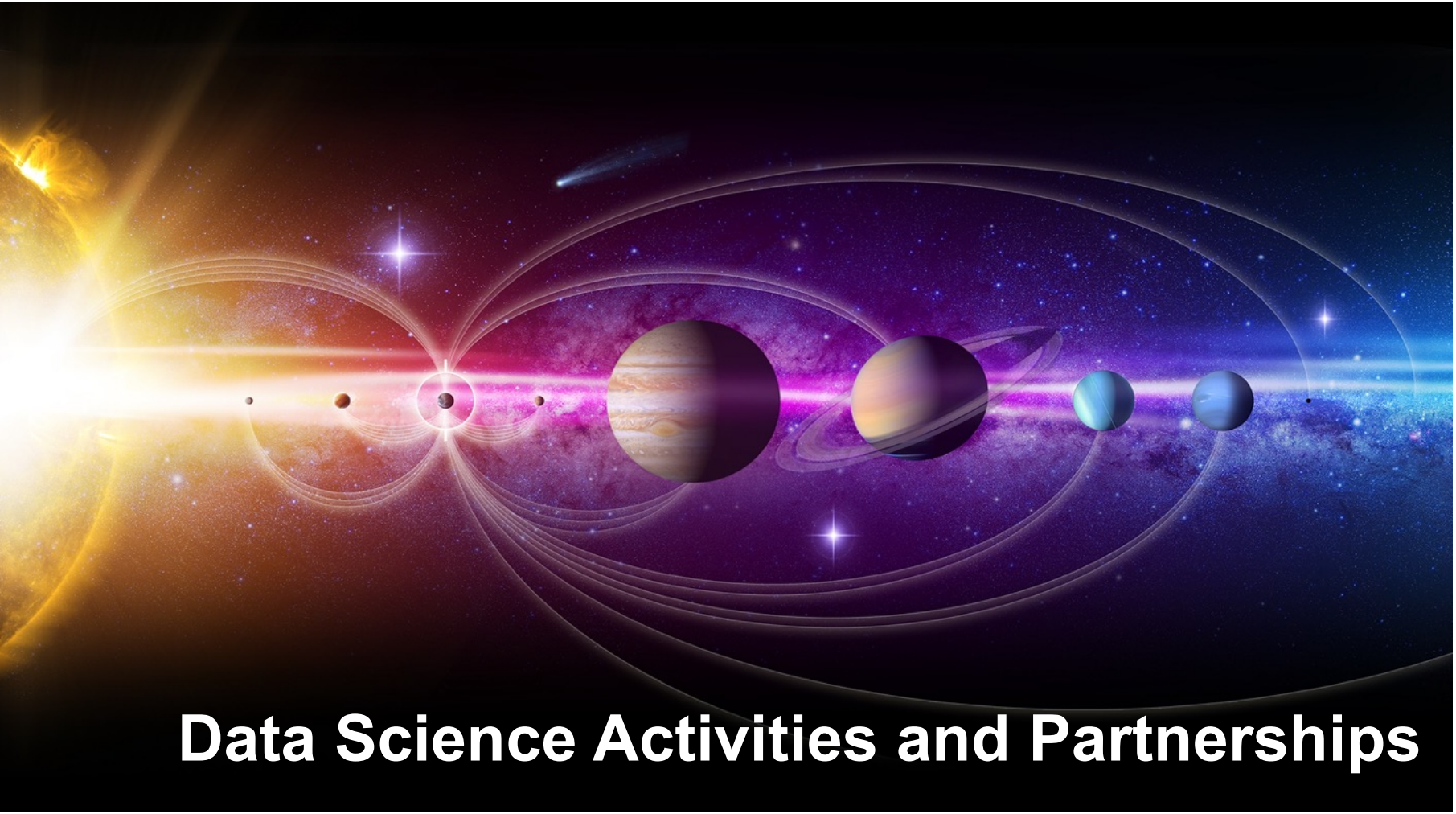
Open Data - placement, publishing, partnerships

Open Code

Open Tools - GitHub, Jupyter Notebooks, Overleaf

FAIR (Findable/Accessible/Interoperable/Reusable) data

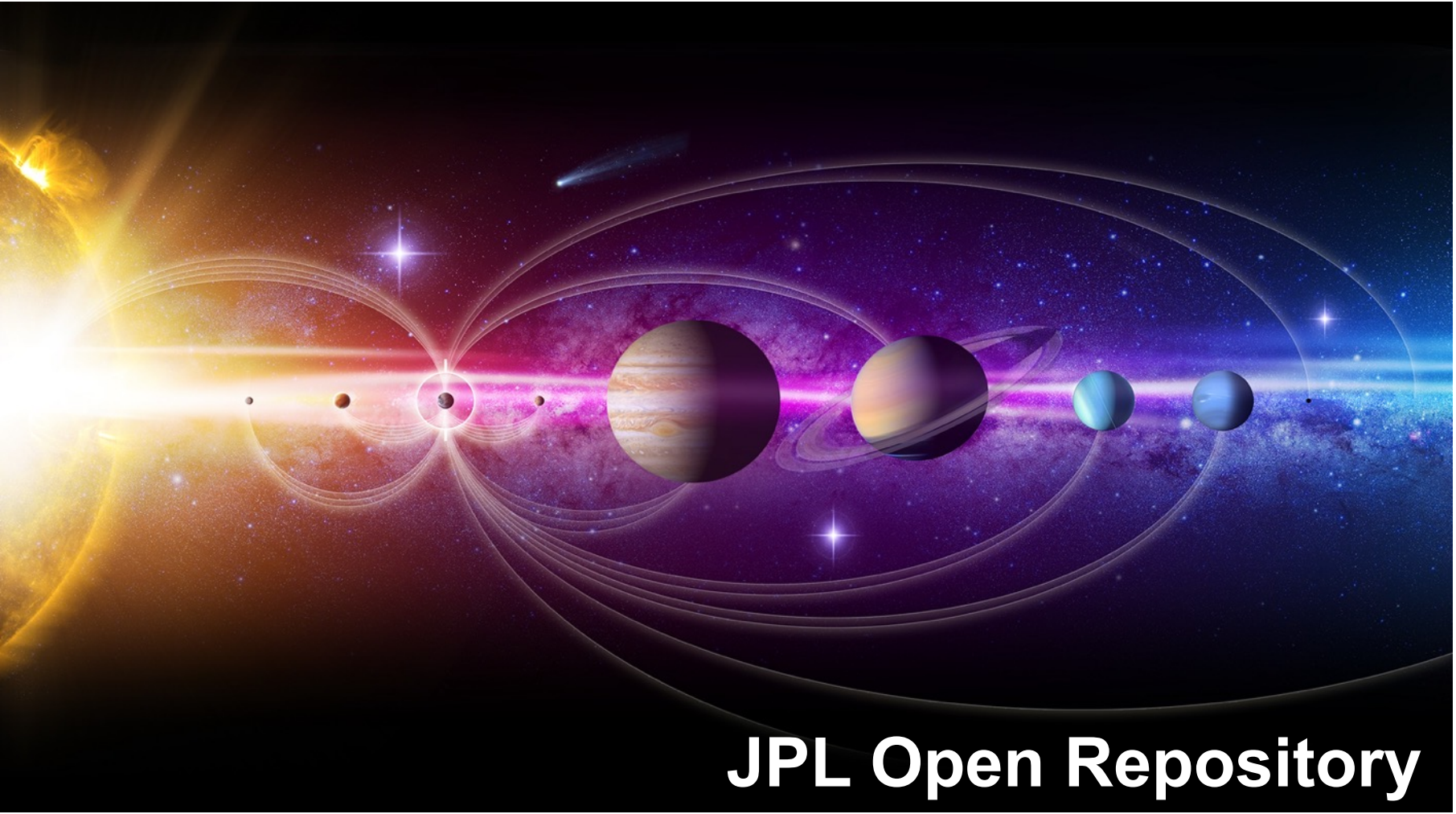
- Search curation
- Data governance standards
- Semantic tools – taxonomy, ontology, knowledge graph



Data Science Activities and Partnerships

Data science activities and partnerships

- Ontology Working Group/Semantic Tech COP
- Data governance partnerships
- DOI minting
- Data placement
- Data Management Plan standards and template
- Taxonomy initiatives
  - Taxonomy librarian position
- JPL Open Repository design (JOR)


JPL Open Repository

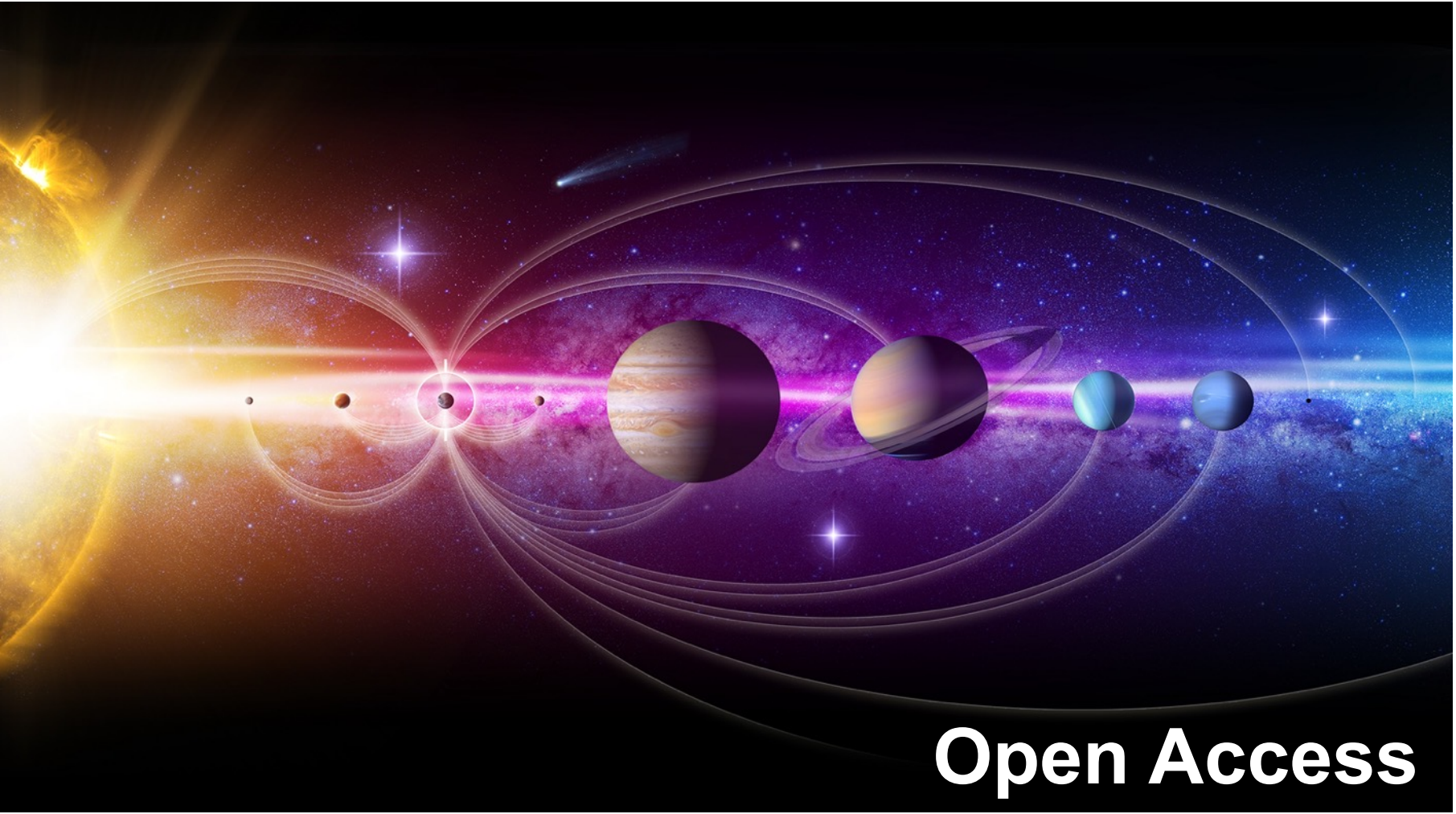
JPL Open Repository

https://dataverse.jpl.nasa.gov
FAIR environment and foundation
Open source

Open science through internal and external sharing of knowledge
- JPL authored publications
- documents
- data
- software.

Need for repository for Interdisciplinary/multidisciplinary data for publication

JOR features:
- Data storage
- Early internal access to embargoed journal articles
- Bundling of publications, code and data to enable interoperability and reproducibility
- Auto abstract
- Auto issuance of DOI
- Capturing and stewarding data assets across all JPL domains
- Semantic search capabilities


Open Access

Open Access

- Explainer presentations to authors and stakeholders
- Transformational agreements
- Joint subscription contracts with Caltech
- Research Access team (partnership with Document Review group)
- Open Access Week annual event with Caltech Library

Knowledge Management Partnership

Partnering with our Knowledge Office - Comparison of Priorities

Library

…informs the work of **knowledge workers** by curating resources and building research connections vital to mission success.

Provides…

- **Research** and enabling technologies
- **Access** to trusted external information
- **Project-specific collections** of science, technology, and engineering resources
- **Advocacy** for access to information, data discoverability and interchange, and intranet curation
- **Expertise**, leadership, and assistance on IM
- **Outreach and training** that builds information literacy
- **Physical space** for learning and information exchange
- **Cooperative relationships** with other libraries, etc.

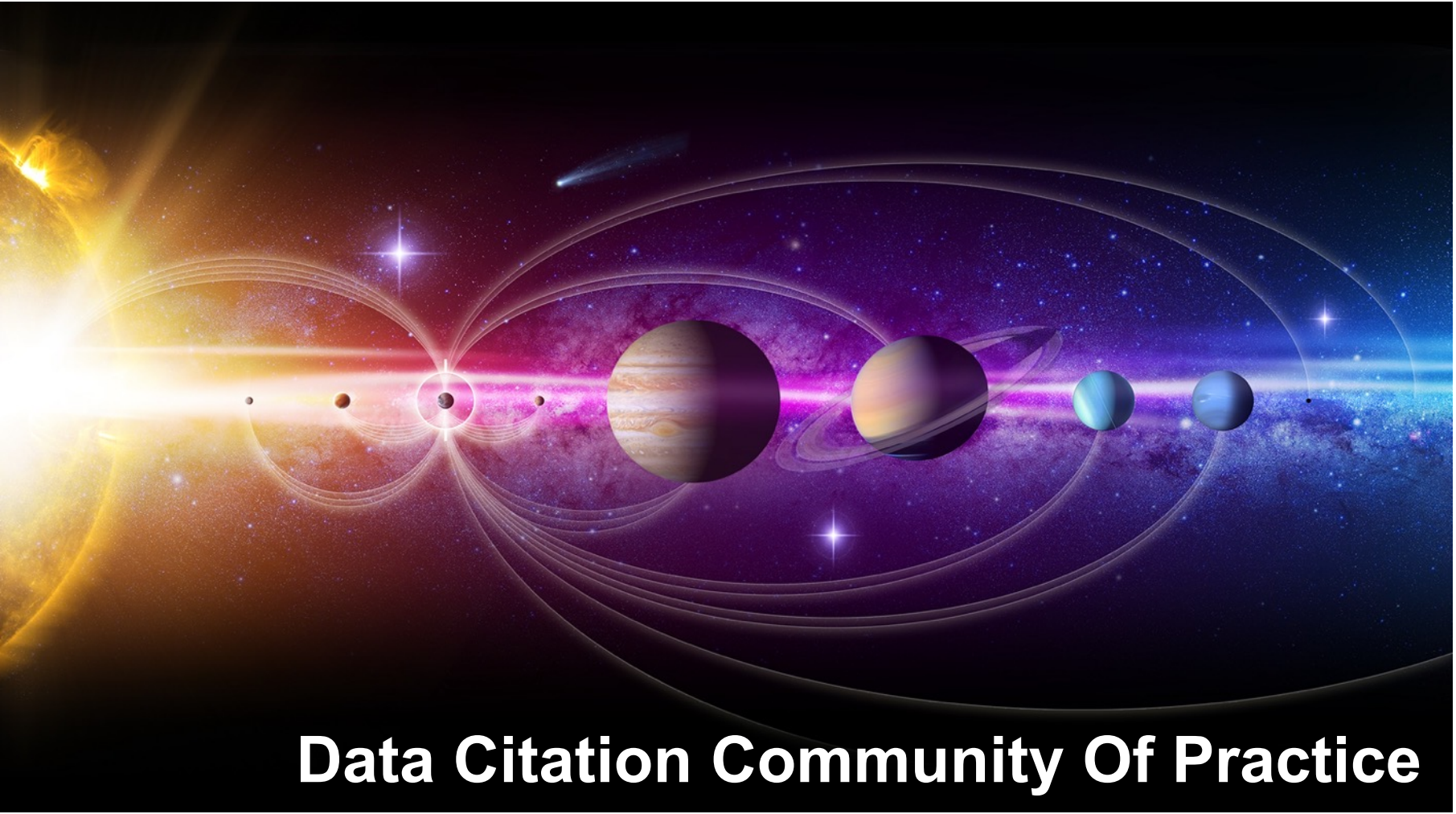
Knowledge Office

…builds and leverages **organizational knowledge** to derive value.

"To make the most of what JPL knows."

Charged to…

- **Connect** people, processes, and technologies
- Identify, create, capture, share, & preserve key knowledge to **leverage** across JPL and NASA
- Drive learning **culture** – understanding of and commitment to KM principles, best practices, and value
- Deliver KM **strategic** plan
- Identify, design, and deploy KM **best practices**
- Measure **progress and impact** of KM programs
- **Coordinate with NASA**-wide KM initiatives.



Data Citation Community Of Practice

Data Citation COP

Created January 2021 after AGU FM 2020 (virtual) various chat threads.

Zenodo page with COP presentations and slides

Slides from PSIDA 2021 (virtual) – scroll to slide #7

Intro and report from PSIDA 2021

The Data Citation Community Of Practice: An Introduction and Report

5th Planetary Data Workshop and Planetary Science Informatics and Data Analytics (PSIDA) Meeting
Tuesday, June 29, 2021

Caroline Coward
NASA Jet Propulsion Library

Deb Agarwal
Lawrence Berkeley Laboratory

Kyle Copas
Global Biodiversity Information Facility

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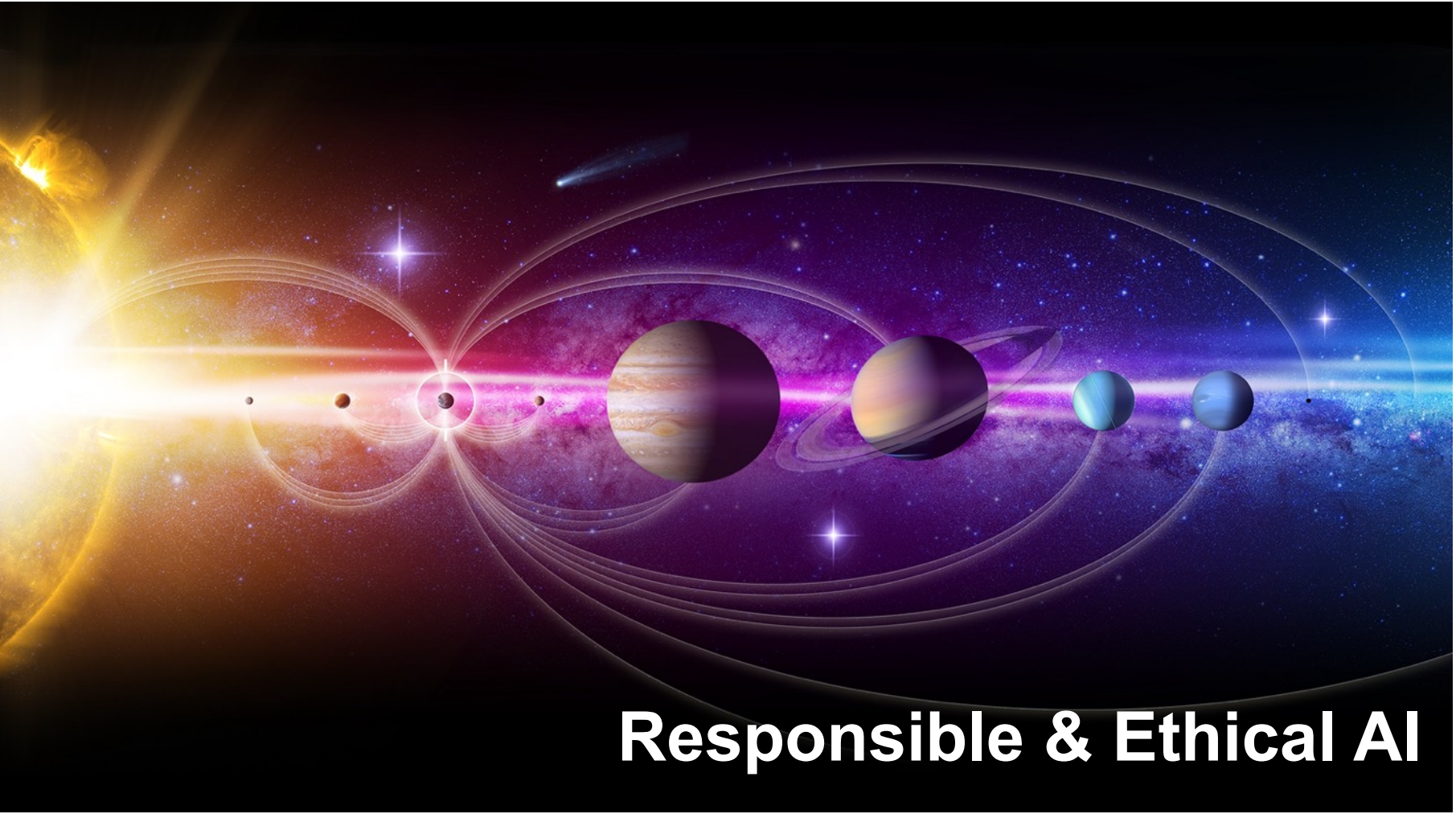

Responsible & Ethical AI

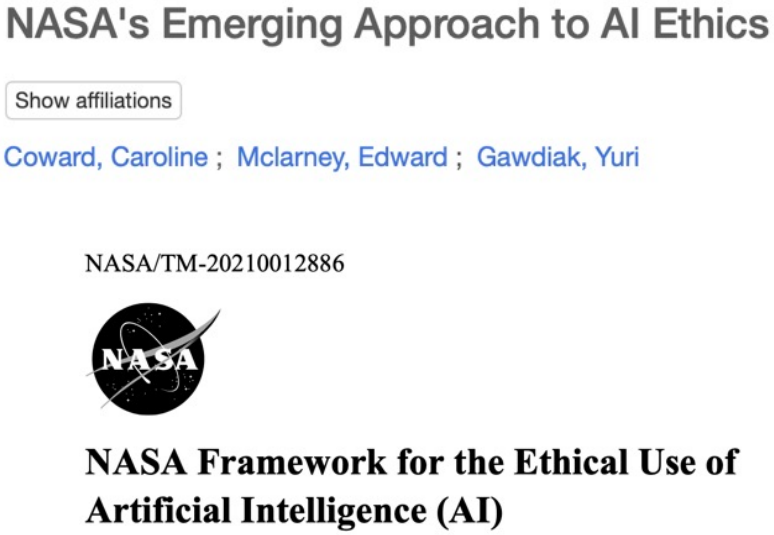
Responsible AI, Ethical AI

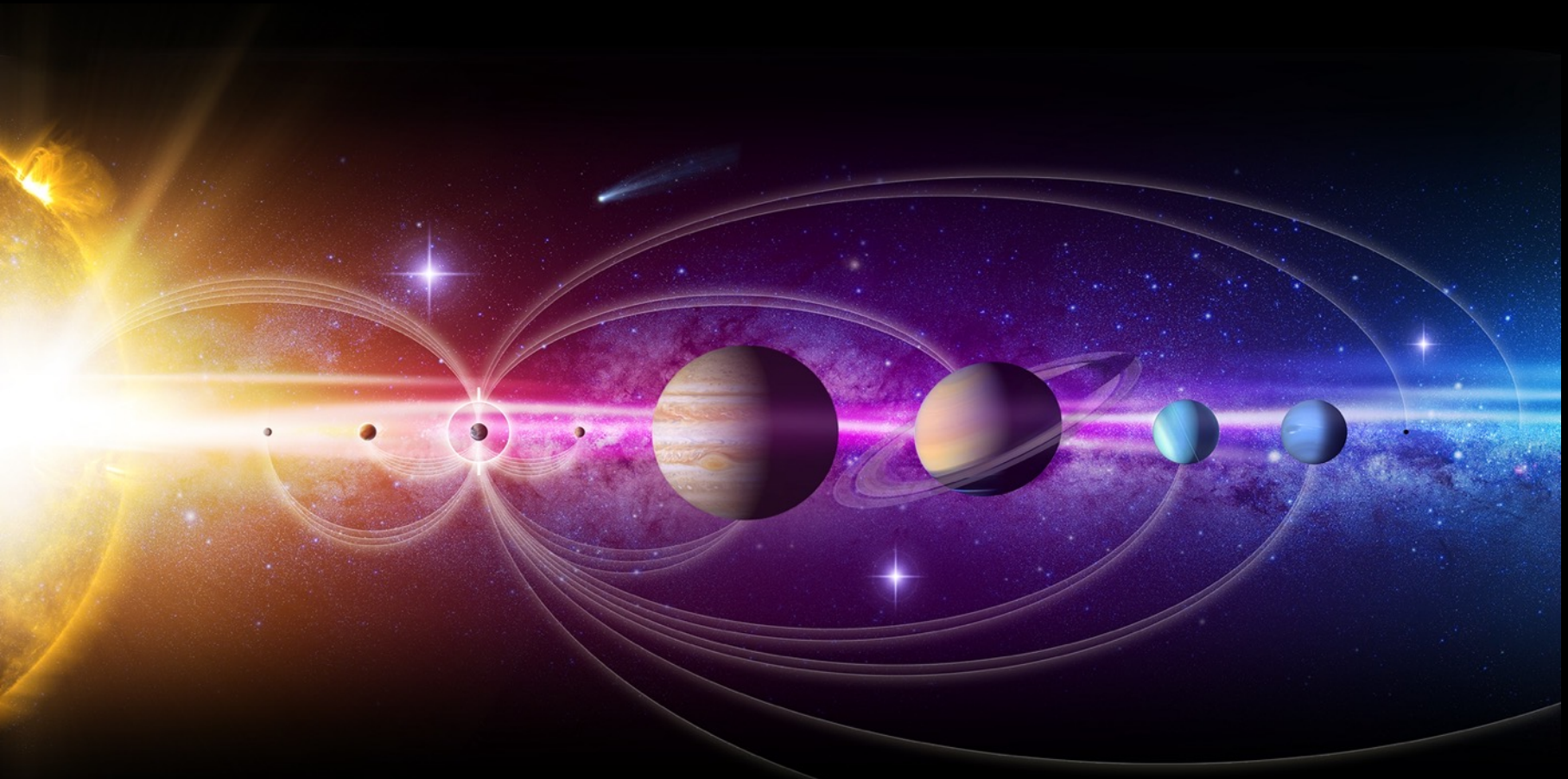
Ethical AI

- Technical Memorandum – Framework for the Ethical Use of AI
- NASA SMD Ethical AI initiative
- 44th COSPAR Scientific Assembly (2022) presentation abstract

NASA Office Of The Chief Scientist Responsible AI Plan

AGU/NASA Ethical AI policy development





NASA Planetary Data Ecosystem Review Board

NASA Planetary Data Ecosystem Review Board

Apr 23, 2021

Planetary Data Ecosystem Independent Review Board Delivers Final Report to NASA

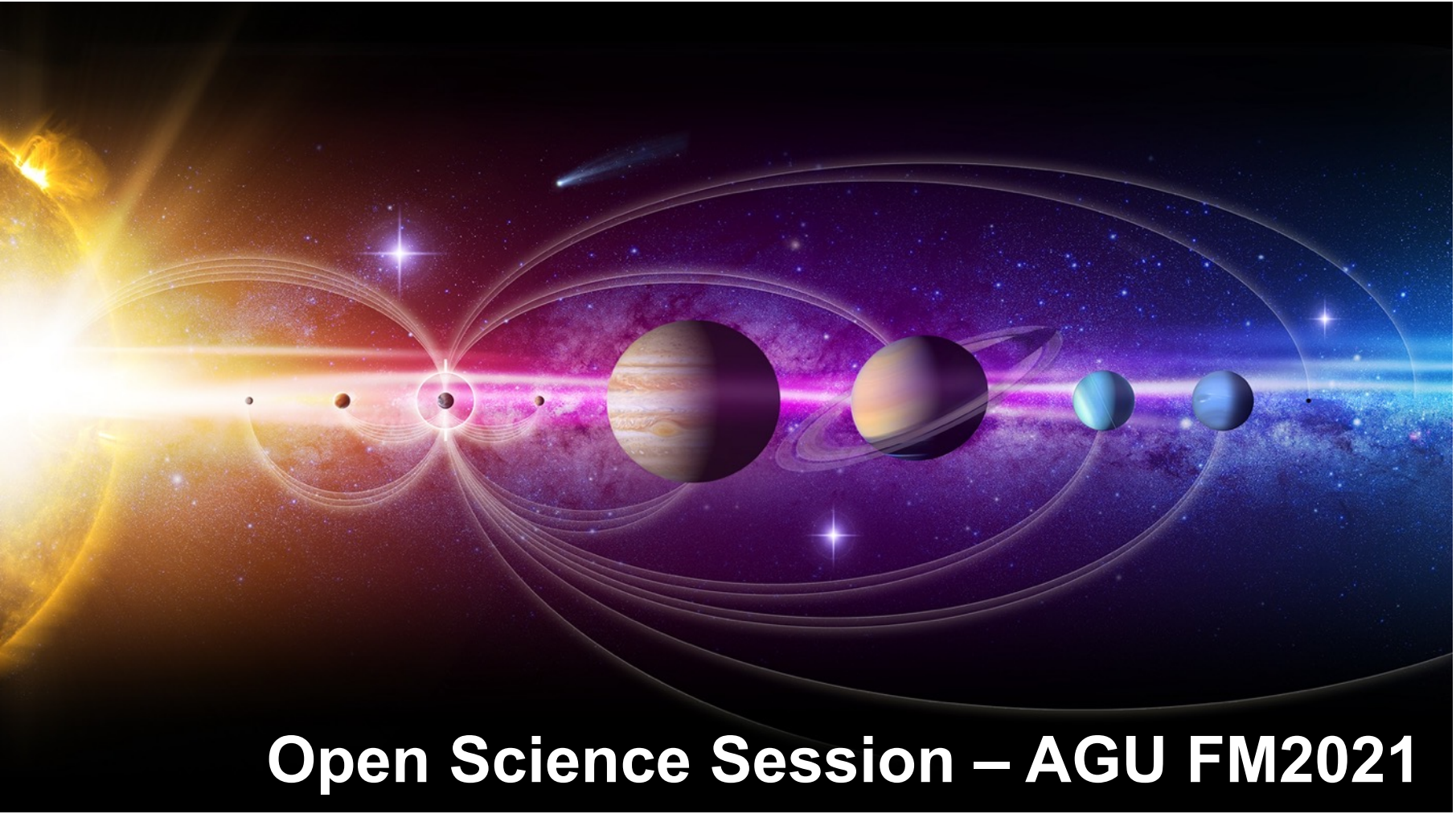
Editor's note: This feature was updated on Aug. 10, 2022 to include an additional link to the PDS IRB final report and briefing.

NASA's Planetary Data Ecosystem (PDE) Independent Review Board (IRB) delivered its final report and briefing to NASA on April 20, after examining information collected about planetary data.

NASA's Planetary Data Ecosystem (PDE) Independent Review Board (IRB) delivered its final report and briefing to NASA on April 20, after examining information collected about planetary data. The IRB provided prioritized actionable recommendations for the agency's Planetary Science Division's (PSD) long-term planning and support of the Planetary Data Ecosystem (PDE).

PDE Final Report

2021 PSIDA (virtual) paper



Open Science Session – AGU FM2021

Open Science at AGU Fall Meeting 2021

Yes, We're Open! The Benefits of FAIR Data and Open Science

https://agu.confex.com/agu/fm21/meetingapp.cgi/Session/123042

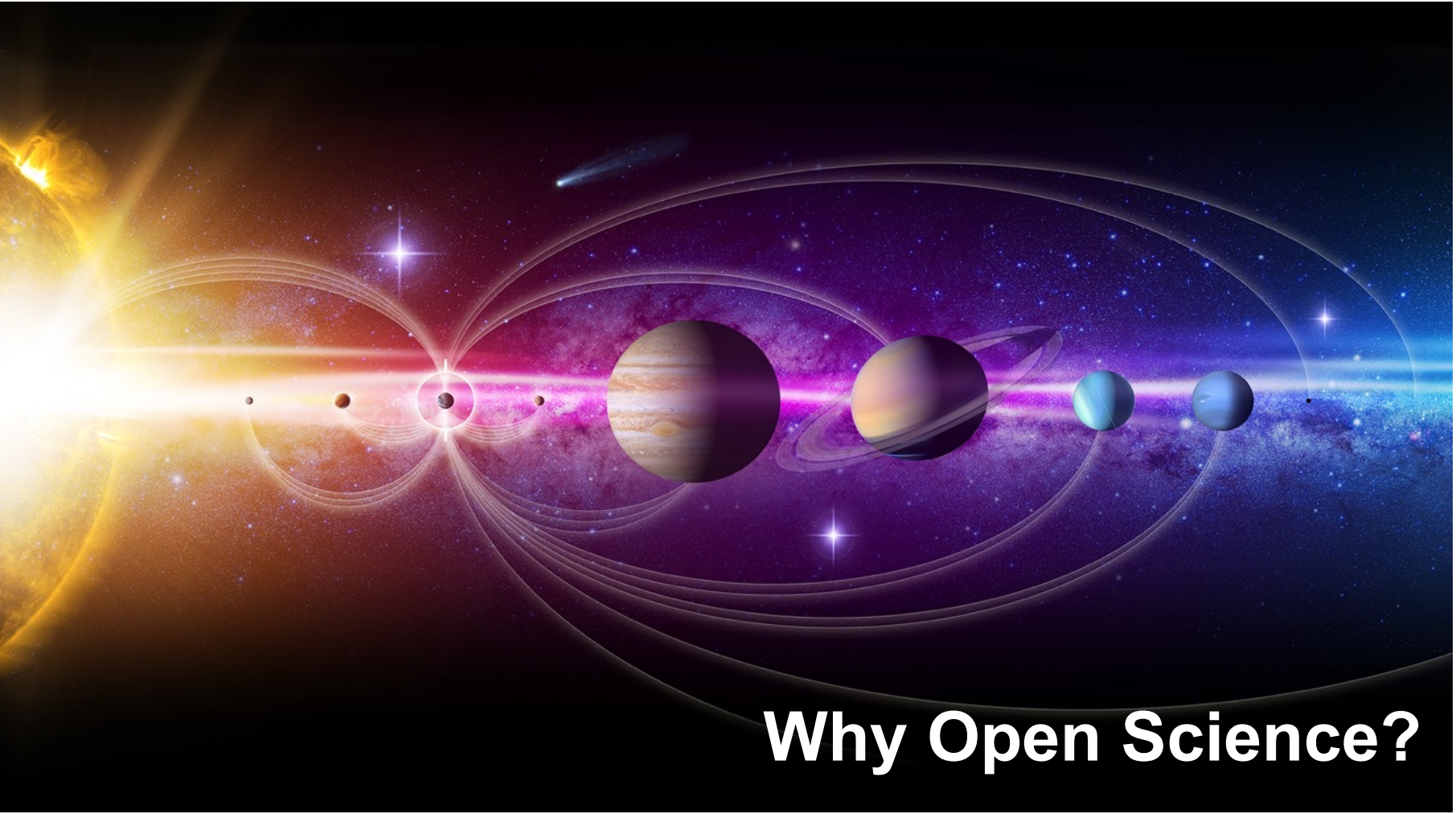
Open Science

- History of Open Science at NASA (keynote - J. Green/NASA)
- NASA's Open Source Science Ecosystem
- Open Science and AI
- Four Diamond OA publishers: Volcanica, Seismica, GEUS Bulletin, Tektonika

FAIR Data

- FAIR data and scholarly communication (keynote – T. Carpenter/NISO)
- New tools and tech
- FAIR practices and the Planetary Data System
- FAIR research facilities in Europe

DEIA in Open Science


Why Open Science?

Why Open Science?

Expanding our scope

- Information science
- Data science
- Computer science
- Knowledge management

Broadening our reach

- Influencing JPL and NASA policy
- Breaking down silos
- NASA, FFRDCs, non-library professional societies (AGU, COSPAR, IAF, et al.)

Raising our profile

- 21st century library
- Breaking down barriers
- Serving users more effectively

Please keep in touch…

caroline.m.coward@jpl.nasa.gov

https://www.linkedin.com/in/caroline-coward-nasa-jpl/

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