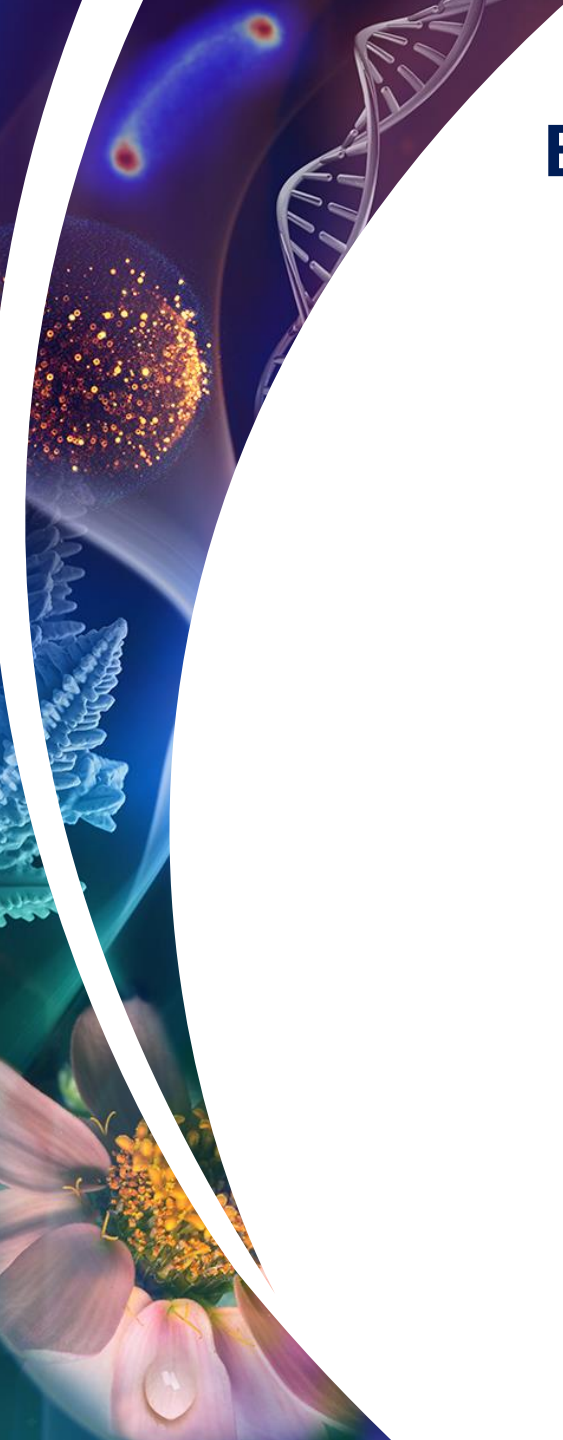




Biological & Physical Sciences (BPS) Data Portals

Joint Plenary Session on Open Science Data

ASGSR 2021

November 4th, 2021

Sylvain Costes/ARC

Karen Stephens/MSFC

ALSDA | GeneLab | PSI

BPS Open Science

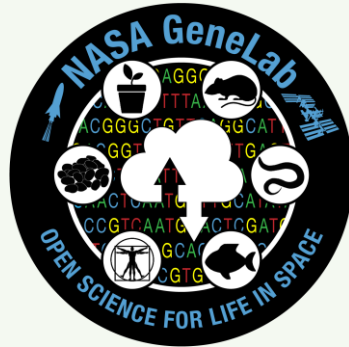
Physical Sciences Informatics (PSI)

- Collects and Curates and Disseminates data
- Physical science experiments performed on the ISS



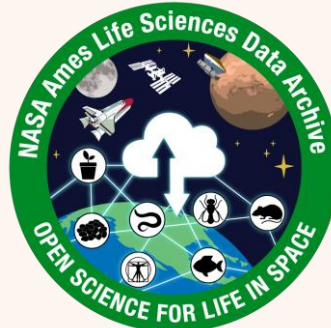
GeneLab (GL)

- Collects and Curates and Disseminates data
- Molecular omics-level data
- Viz Portal - Enviro Portal
- Analysis Toolshed



Ames Life Sciences Data Archive (ALSDA)

- Collects and Curates and Disseminates data
- Physiological-level data
- Mission and Project data
- Imaging data



Biospecimen Sharing Program (BSP)

- Dissects and preserves rodent tissues from Flight and Ground investigations
- Coordinates internal tissue sharing



NASA Biological Institutional Scientific Collection (NBISC)

- Collection of non-human biospecimens
- ARC Biospecimen Storage Facility (BSF)
- Space Microbial Culture Collection



BPS Open Science Data Repositories (OSDRs)

ALSDA

Ames Life Sciences Data Archive



<https://www.nasa.gov/ames/research/space-biosciences/alsda>

GeneLab



<https://www.nasa.gov/genelab>

PSI

Physical Sciences Informatics



<https://www.nasa.gov/psi>

GeneLab



Genelab.nasa.gov

335

Studies

383

Datasets

45

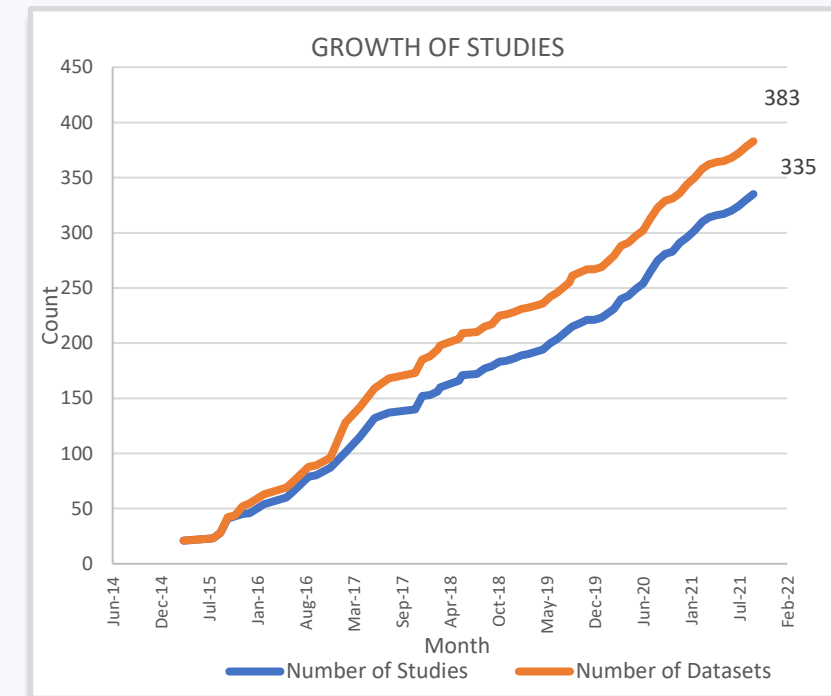
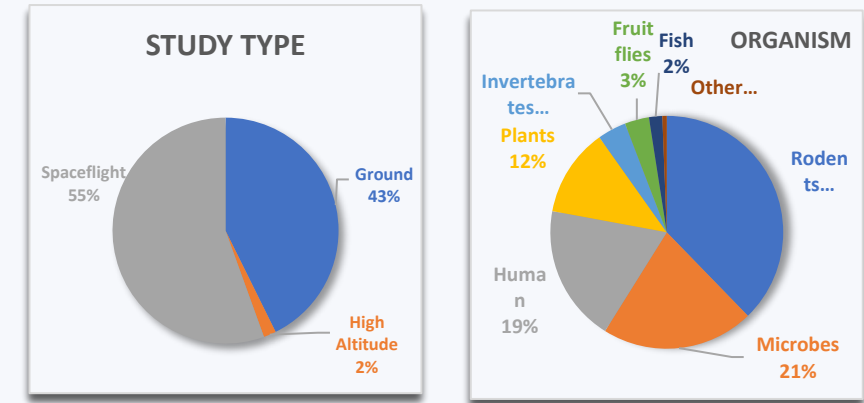
Species

>10

Assays

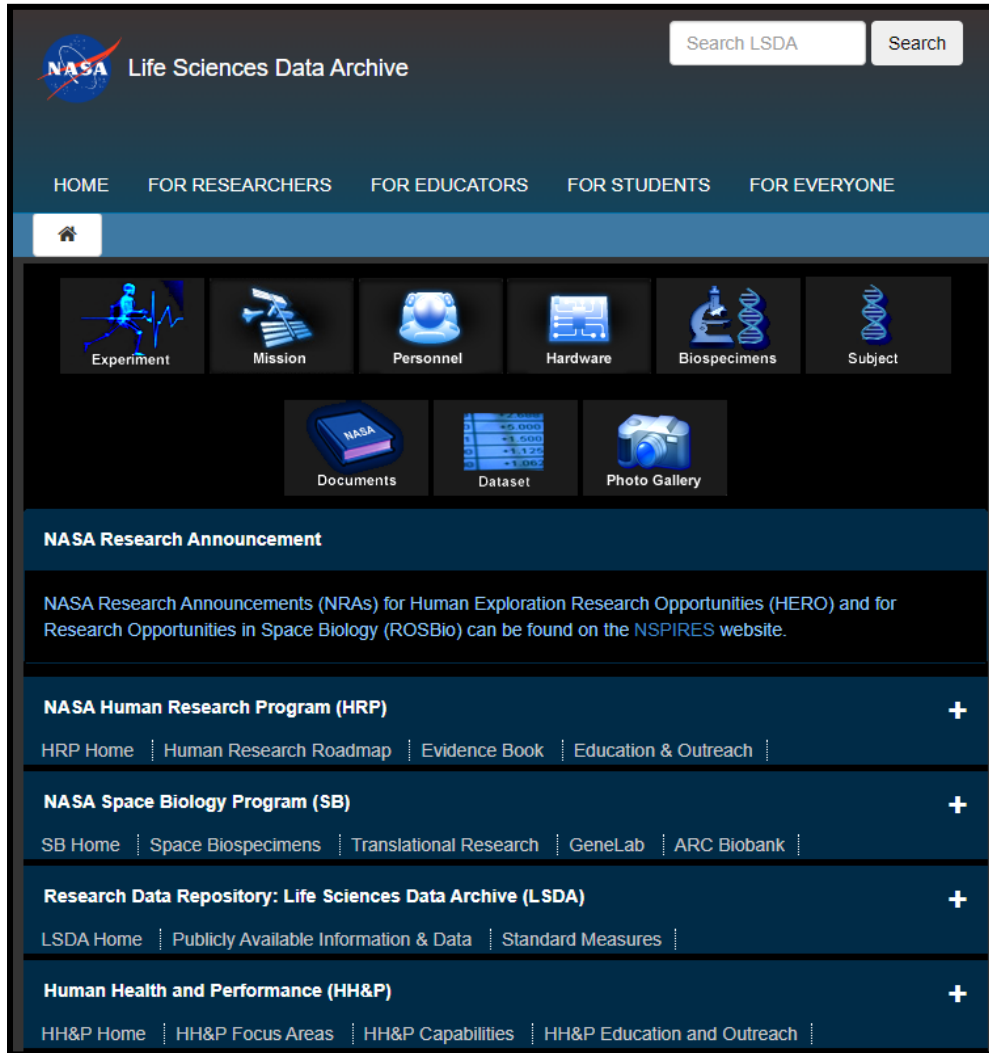
>130 TB

Data

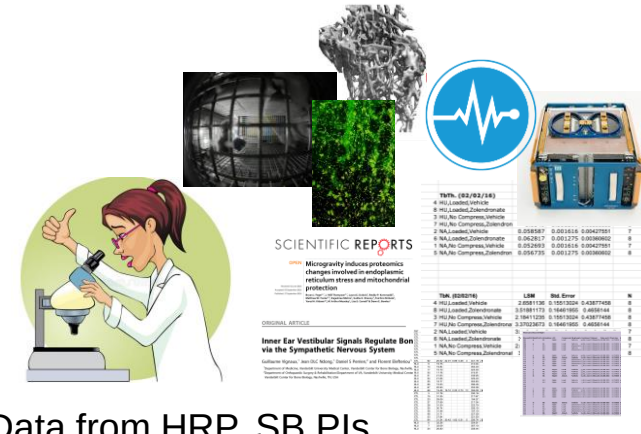


ALSDA

Ames Life Sciences Data Archive

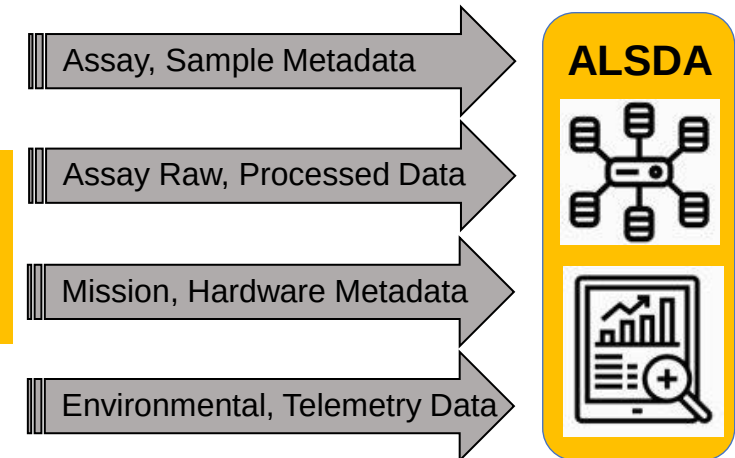


<https://www.nasa.gov/ames/research/space-biosciences/alsda>
<https://lsda.jsc.nasa.gov/>

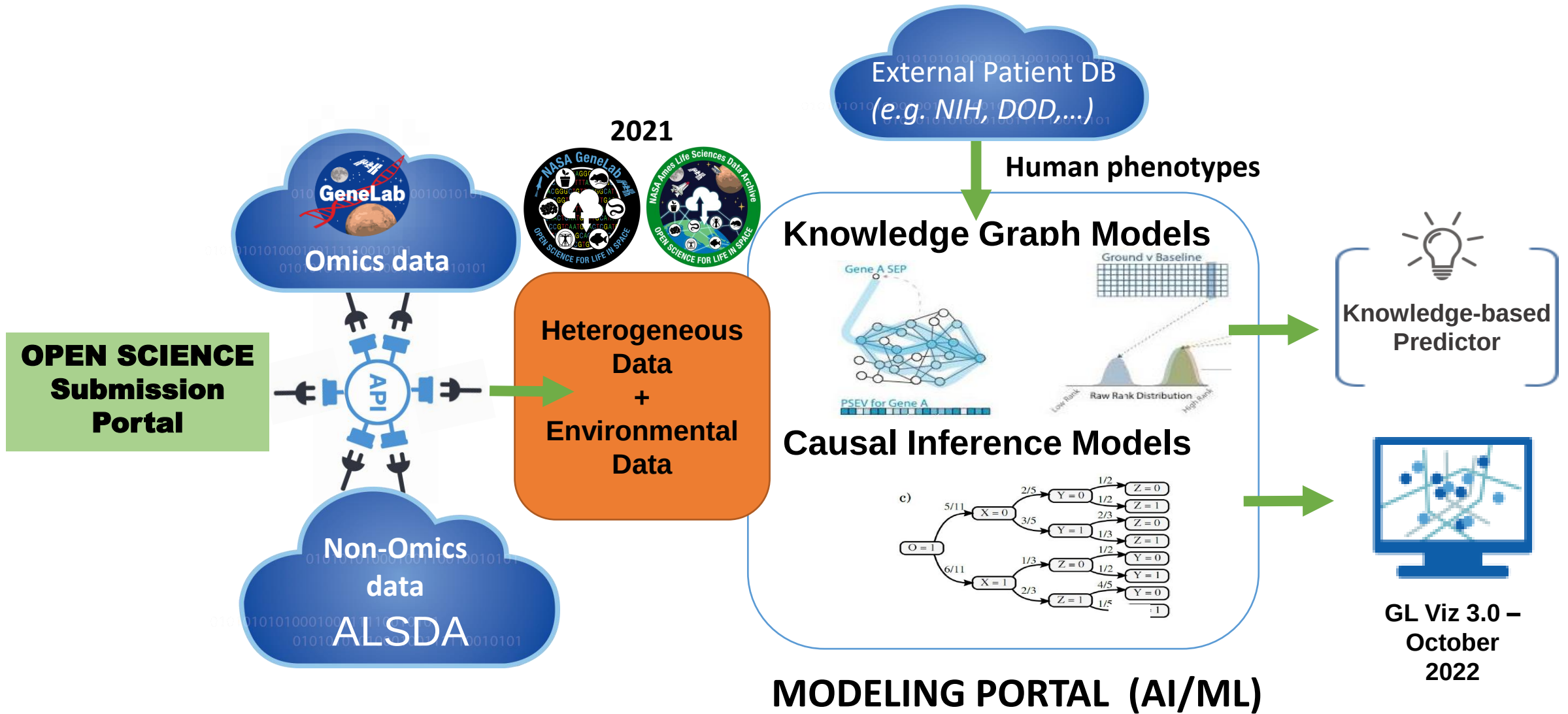


- Data from HRP, SB PIs
- Phenotypic-Physiological-Behavioral-Level Data
- Federated with GeneLab (Omics-Level Data)

**OSDR Data
Submission
Portal**

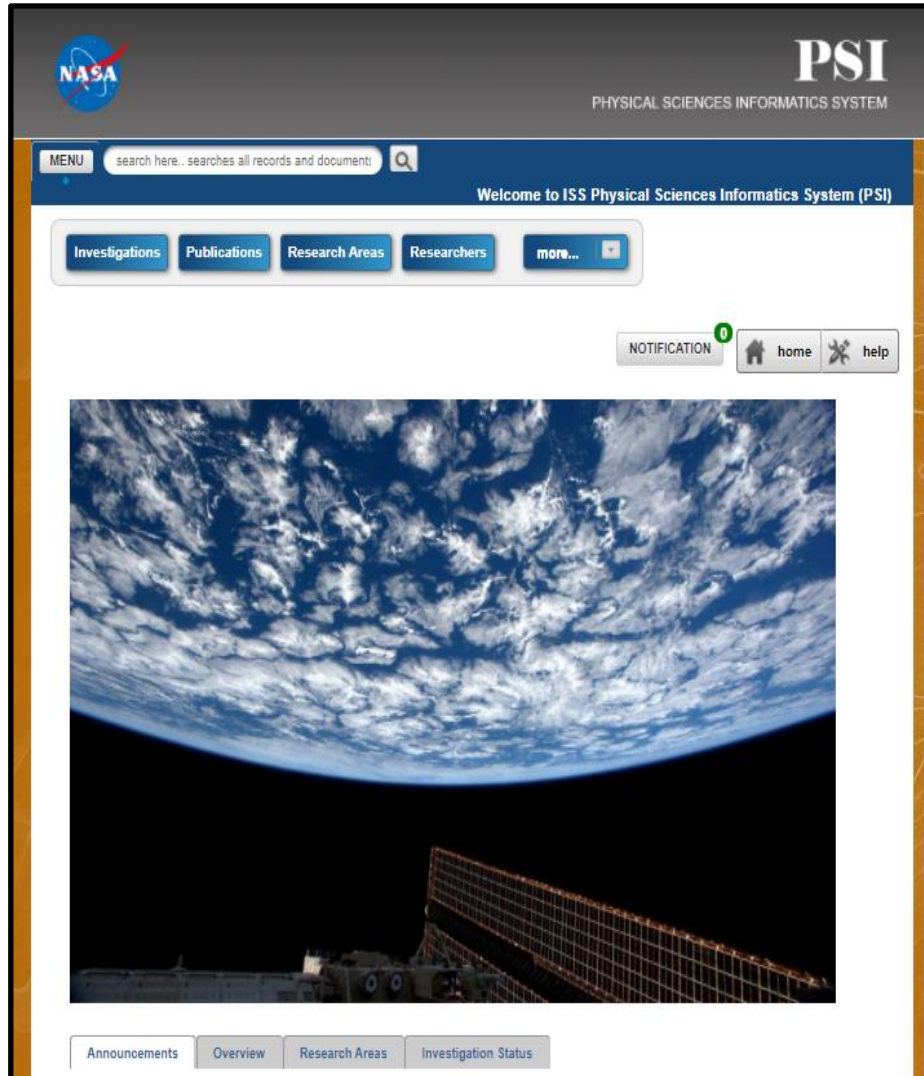


From multiple databases to a knowledge-based system

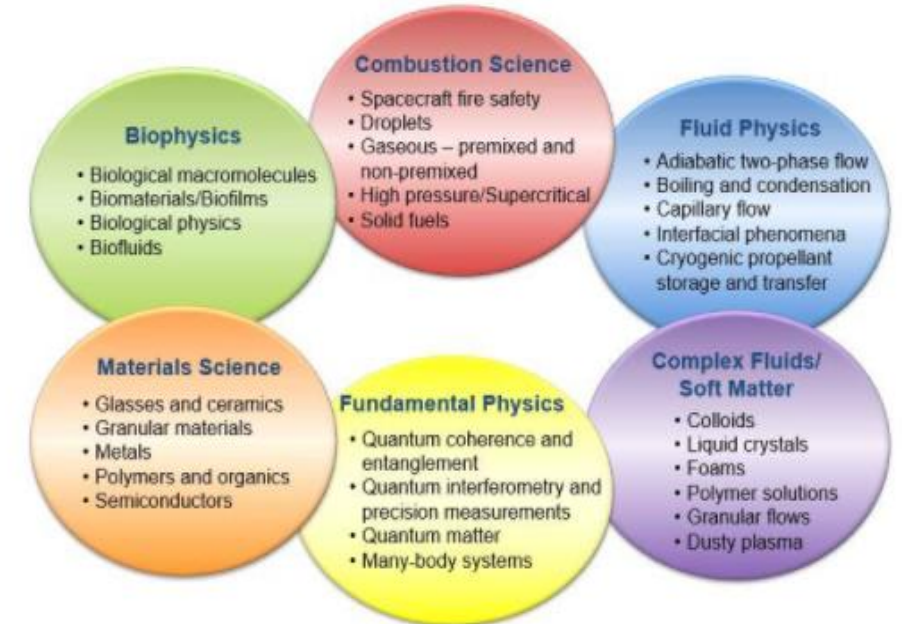


PSI

Physical Sciences Informatics



<https://www.nasa.gov/psi>



78 Investigations in 6 Research Areas

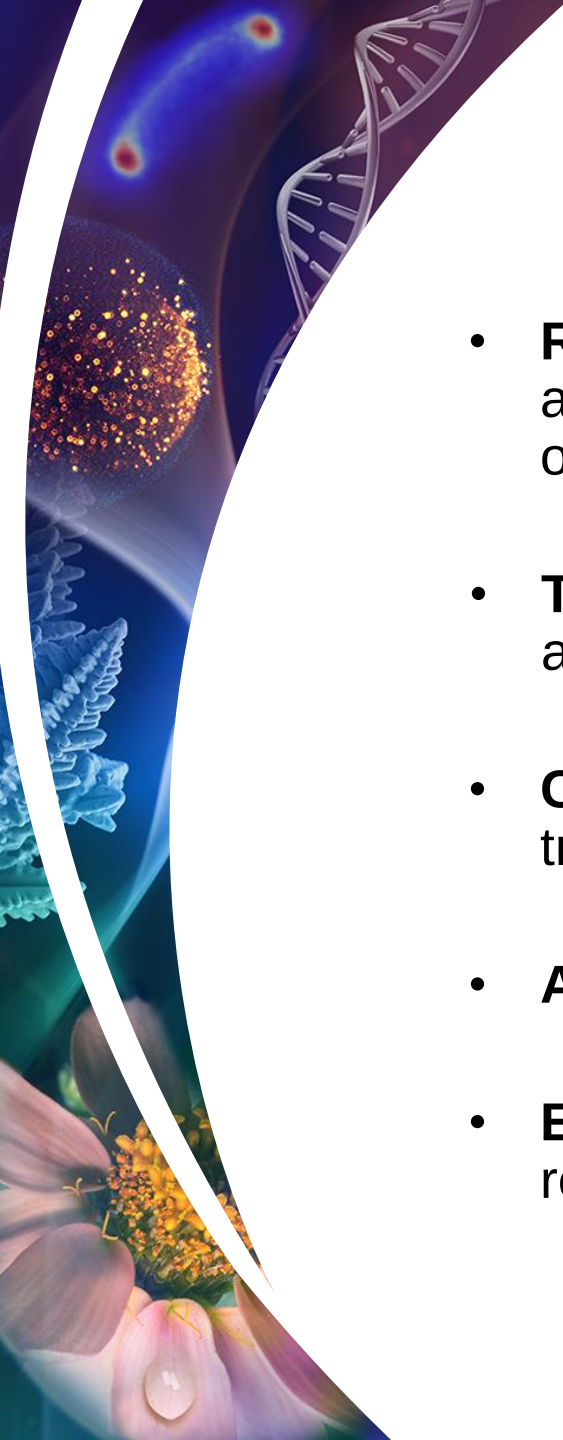
>17 TB data

1,372 users, primarily in academia

Coming soon - new user interface and working group

Future of Open Science at BPS



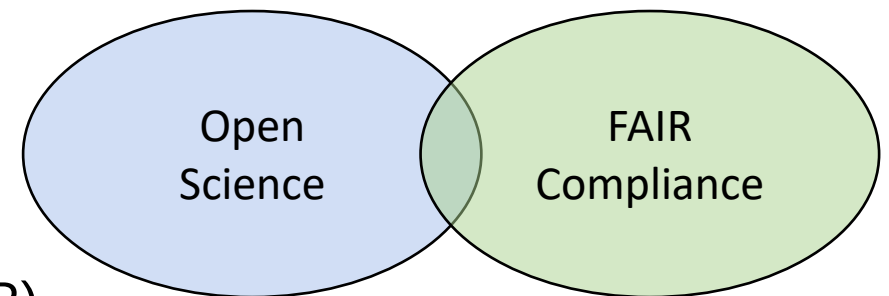


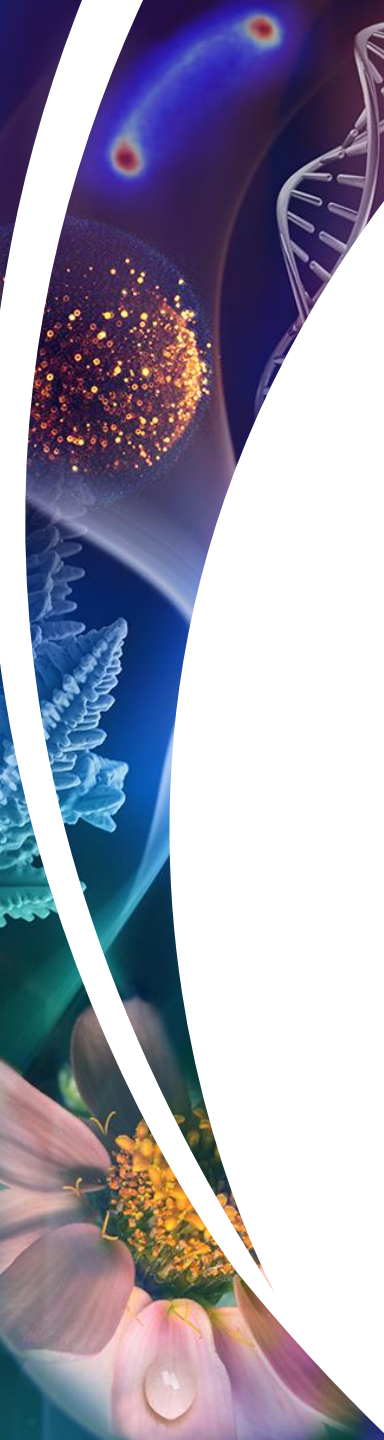
Vision for BPS Data Management

- **Respond** to the new SMD Information Policy with a BPS Data Policy to address BPS-unique research data concerns (experimental vs observational).
- **Transform** manual data management tasks into more robust, efficient, and automated digital processes.
- **Connect** BPS data systems through shared tools as a first step toward a truly federated science data management environment.
- **Accelerate** FAIR compliance, advancing systems towards Open Science.
- **Enable** proposers, awarded PIs, Project Scientists and the archives to meet requirements through improved guidance and communication.

Improve Archives Support for Open Science

- **Optimize Use of Cloud Computing**
 - For data archiving in OSDR
 - For investigation workspaces, during and after investigation
 - For *ad hoc* data sharing
 - For HPC / data analysis platforms
- **Provide earlier support for investigation planning and Transparency of Data**
 - Sharing of designs for experiments, observations
 - Guidance for Data Management Plans (DMPs)
 - Data versioning (FAIR)
- **Further Data Democratization**
 - Use of “rich” metadata (FAIR)
- **Improve AI-Readiness**
 - Descriptive logics for metadata (FAIR)





Pain Points

- Proposers only know half the story
 - Lack of knowledge/access to the full implementation of a spaceflight experiment
 - Lack standardization of the Data Management Plan
- Investigator's data delivery is often a difficult (and avoided) last step
 - Delivering enormous amounts of data
 - After funding is largely spent
- Repositories spend enormous efforts locating and collecting data from all sources
 - Little time left for quality control, system improvements, tool development
 - Mission and Vehicle data is inconsistent and insufficient



Options for Improving BPS Data Management Environment

- Improve **communication** of guidance, policy, best practices, requirements
- Involve all data providers: Investigators, Project Scientists, Payload Developers
- Provide new **tools** improving data management, delivery and ingest into data repositories
- **Automate processes** (e.g. pipeline for ingesting and processing flight mission data, enhance data submission systems)
- Facilitate environment for **FAIR** data to maximizing data access and re-use



Impacts of Open Space Science

Dr. Plansky

Dr. Dunn-
Rankin and
Dr. Chein

Dr.
Wyrobek

Dr. Barker



Panel – Audience Questions

We would love to hear from you about....

- Open Science
- Ideas on new opportunities
- Pain points
- Resources

