Data Archives and Services of the NASA Heliophysics Digital Resource Library (HDRL)

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Code 670/NASA Goddard Space Flight Center (GSFC)

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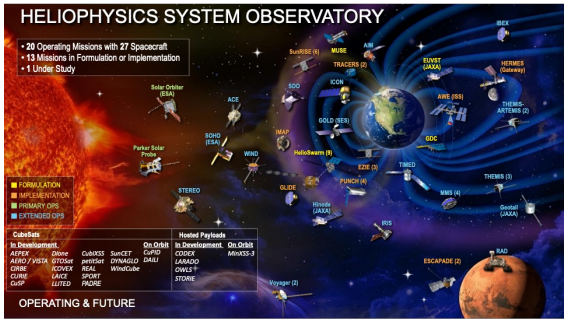
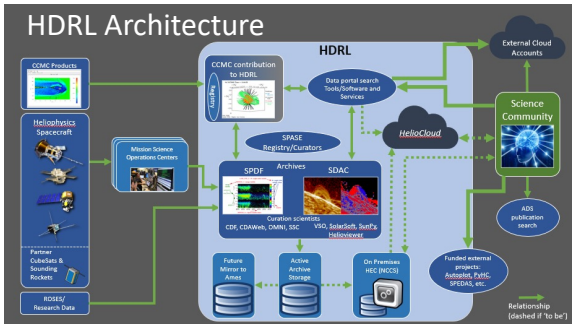
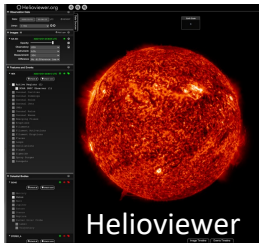
Heliophysics Digital Resource Library (HDRL)

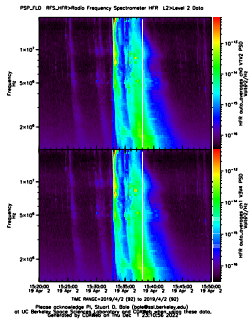
- The HDRL coordinates the efforts of the Heliophysics archives and other data-related groups to
  - increase discoverability and usability of data and model results, software and services for the Heliophysics System Observatory (HSO) (see missions at right);
  - improve metadata and provenance and quality control;
  - and facilitate machine learning and other large-scale and collaborative analysis.
- The Solar Data Analysis Center (SDAC umbra.nascom.nasa.gov) and the Space Physics Data Facility (SPDF.gsfc.nasa.gov) archive and serve solar and non-solar observational data.
- The Community Coordinated Modeling Center (CCMC) provides empirical and first-principles simulations and analysis and display tools.
- The Heliophysics Data and Model Consortium (HDMC) provides many registry, access, and analysis standards and tools.
- The International Heliophysics Data Environment Alliance (IHDEA.net) further coordinates heliophysics data-related efforts world-wide.

- HDRL also builds critical infrastructures for the Heliophysics Data Environment:
- Common Data Format (CDF) self-describing science file format (cdf.gsfc.nasa.gov)
- Heliophysics Data Portal discipline-wide data inventory and access service and its underlying SPASE metadata
- ISTP/IACG/SPDF Metadata Guidelines of standardized internal metadata for understanding datasets
- SPASE (Space Physics Archive Search and Extract, www.spase-group.org/) team define standardized metadata for dataset discovery, including through the Heliophysics Data Portal, heliophysicsdata.gsfc.nasa.gov









CDAWeb plots

HDRL Recent Activities

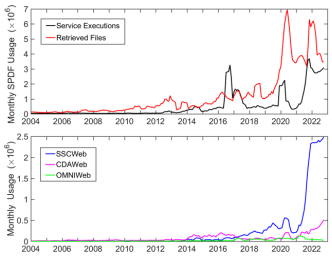
- Standardizing the ISTP Metadata Guidelines used for self-describing datasets
- Porting the Java-based 4D Orbit Viewer to a more portable browser-based viewer
- Improving the Heliophysics API (HAPI) data streaming protocol
- Web site redesigns using the US Government Web Design System
- Extending the SPASE metadata for describing datasets and other heliophysics resources
- Improving the Heliophysics Data Portal (HDP) discipline-wide data inventory and access service
- Creating the HelioCloud cloud-based and open on-premise large-scale and collaborative data analysis environments
- Coordinating Python library efforts (heliopython.org) and other software projects

Other Activities of the HDRL Components

- SPDF provides three main science-enabling services besides archiving data
  - CDAWeb (Coordinated Data Analysis Web): browse, correlate, and display
  - SSCWeb (Satellite Situation Center): orbit/ground track displays and queries
  - OMNIWeb Plus: solar wind conditions, especially at bowshock nose

- SDAC archives solar data and in addition:
  - runs the Virtual Solar Observatory (VSO),
  - Helioviewer.org displays of solar images
  - Supports SolarSoft IDL library and SunPy Python library

SPDF data and services enable global-scale, multi-mission heliophysics science



https://hdrl.gsfc.nasa.gov

Poster at https://spdf.gsfc.nasa.gov/pub/documents/SPDF/presentations/

SSCWeb and the 4-D Orbit Viewer