HEASARC

https://heasarc.gsfc.nasa.gov/

Introduction and overview of services

by Tess Jaffe representing the team:

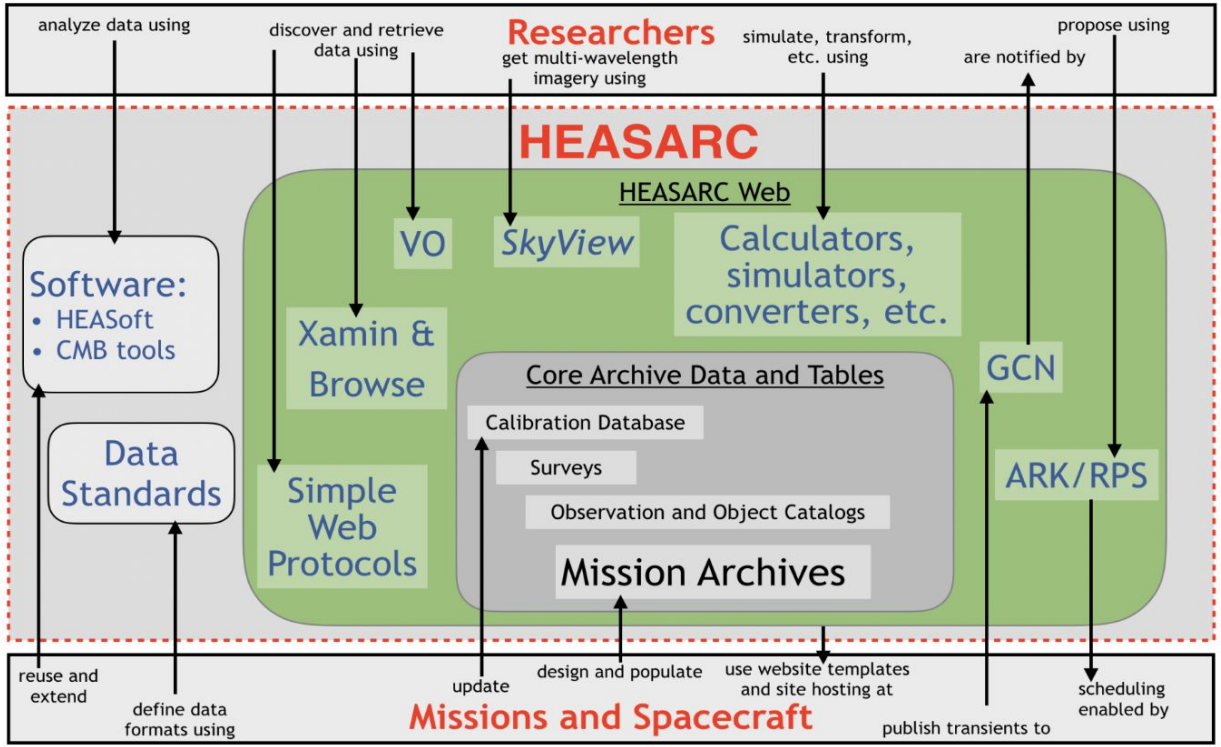
Alan Smale – **Director**;
Lorella Angellini – **Project Scientist**;
Tess Jaffe – **Chief Archive Scientist**;
Brian Powel – **Data Scientist**;
Mike Corcoran, Keith Arnaud, Antara Basu-Zych, Abdu Zoghbi, Steve Sturner – **Archive Scientists**
Ed Sabol – **Database administrator and web tools team lead**;
Phil Newman, Steve Fantasia, MIke Arida – **system and web administrators**;
Bryan Irby – **HEASoft lead**;
Meredith Gibb, Carina Kan, Michael Preciado, Kristin Rutkowski, Craig Gordon, Pan Chai, Matt Elliot, Jesse Allen, James Runge – **web and analysis software developers**;
Doug van Orsow – **Bibliographer;**
JD Myers – **website curator.**

(Plus LAMBDA team for CMB related data and tools, Tom Essigner-Hileman, Science Lead)

Presented 2023 Feb 22 at the XRISM Workshop, UMD

Overview

- Website
- Data archive
  - Xamin and Browse
  - Bibliographic data
  - APIs
- Software
  - HEASoft, Caldb
- Platforms
  - Hera -> SciServer
- Proposal and science tools
  - ARK/RPS
  - WebPIMMS SkyView
  - Viewing
- Community
  - News feed
  - Calendars
  - Helpdesks
- SPD-41a support



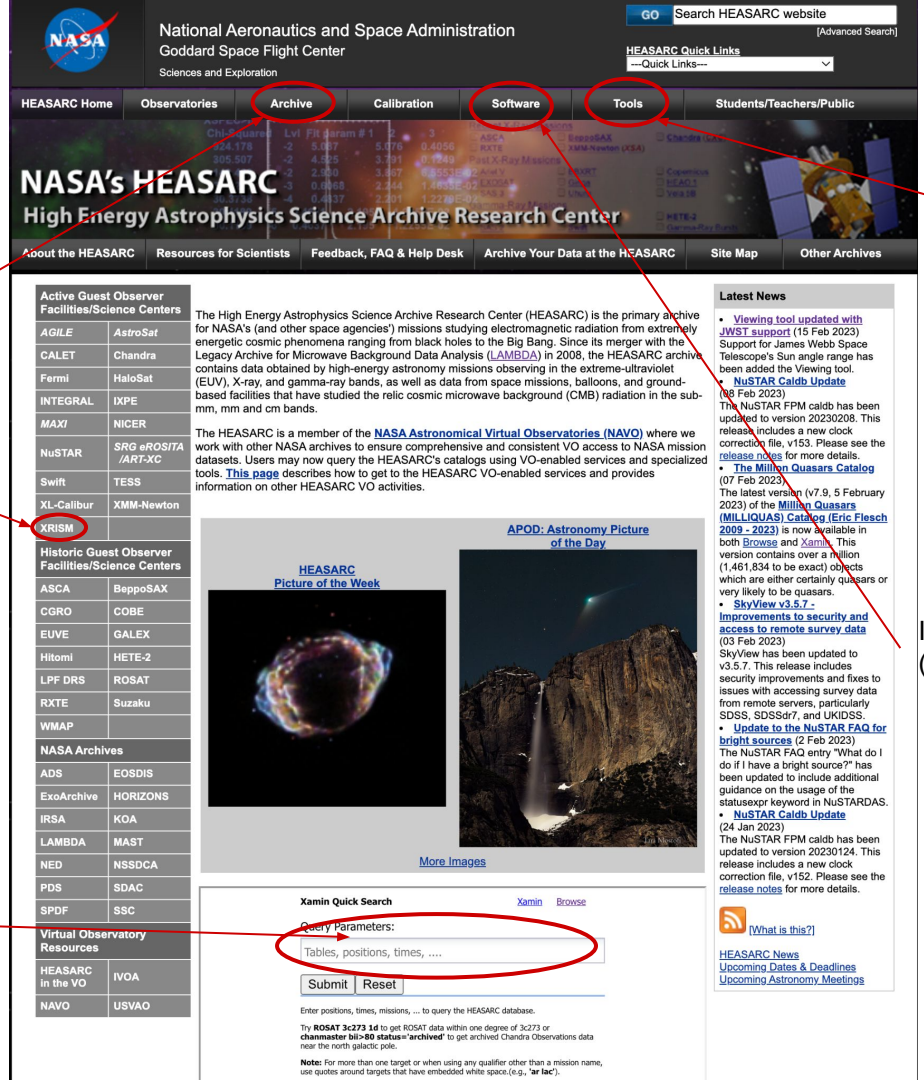
HEASARC

[home](#)

Info on different ways to access the archive

Go to mission support for XRISM

Quick archive search, e.g., “hitomi, crab”

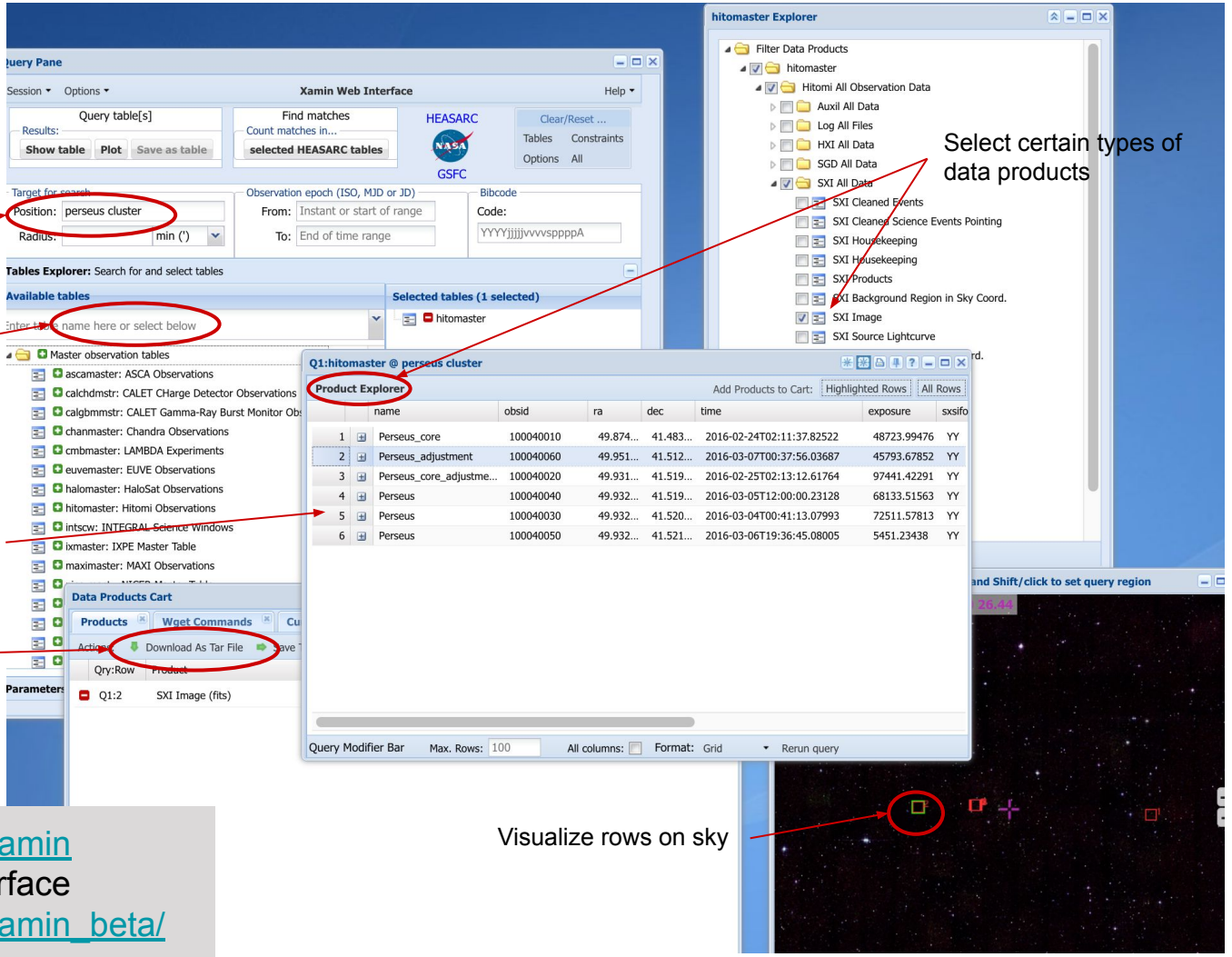


Info on web tools like calculators, converters, etc.

- General Tools
- Bibliography
- Coordinate Converter
- Energy Converter
- FITS File Verifier
- nH Column Density
- Time/Date Converter
- X-Ray Background
- X-Ray Source Finder
- Multi-Mission Tools
- NEW SciServer
- Hera
- RPS
- Timeline Tool
- Viewing
- WebPIMMS
- WebSpec

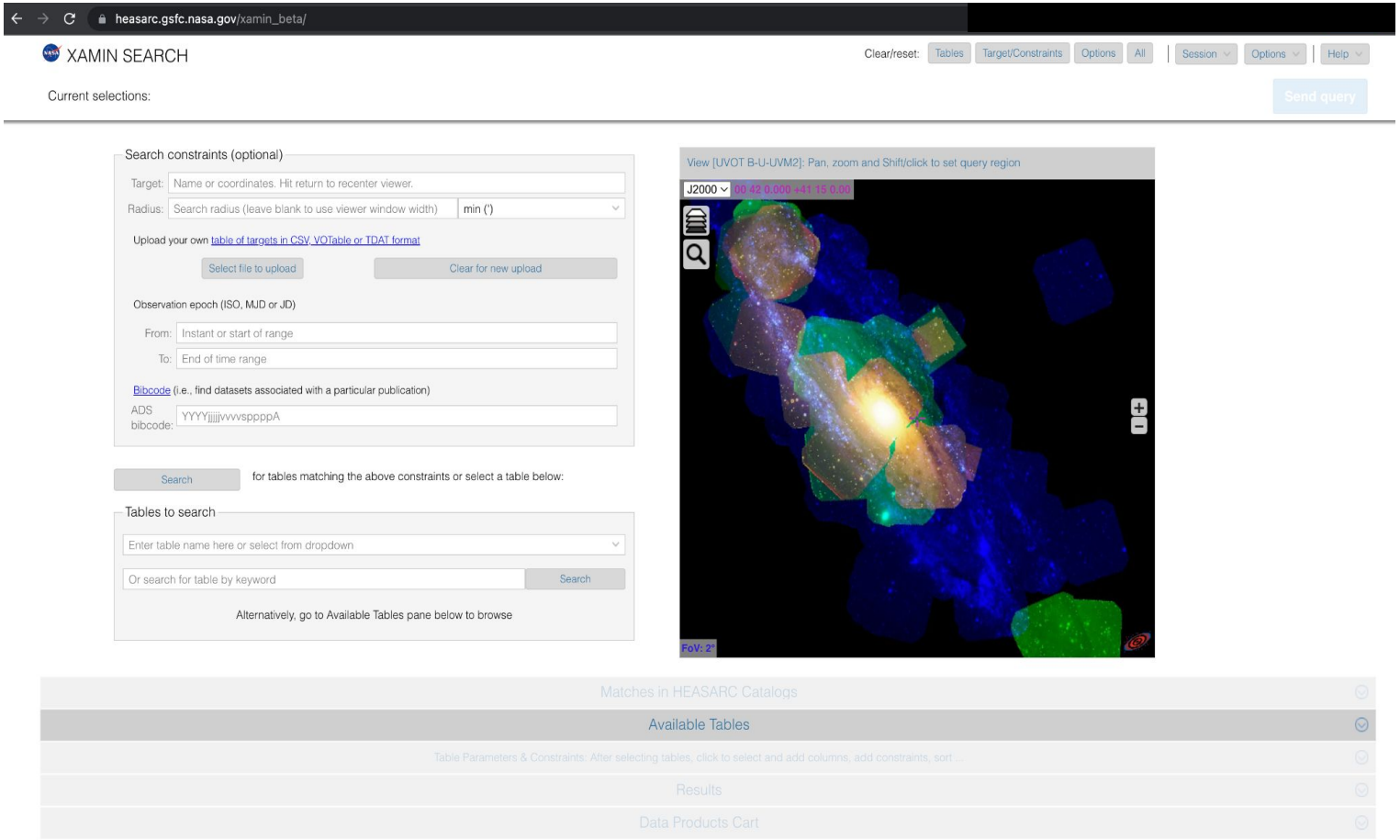
Info on analysis software (HEASoft, PIMMS, etc.)

Interactive portal: Xamin

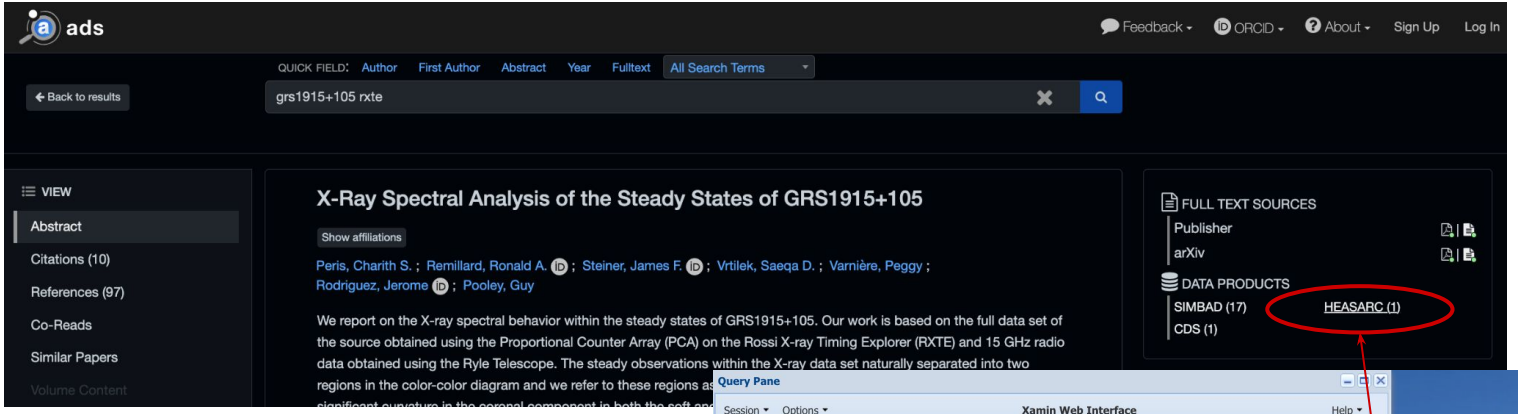


https://heasarc.gsfc.nasa.gov/xamin
Or to try out our NEW beta interface
https://heasarc.gsfc.nasa.gov/xamin_beta/

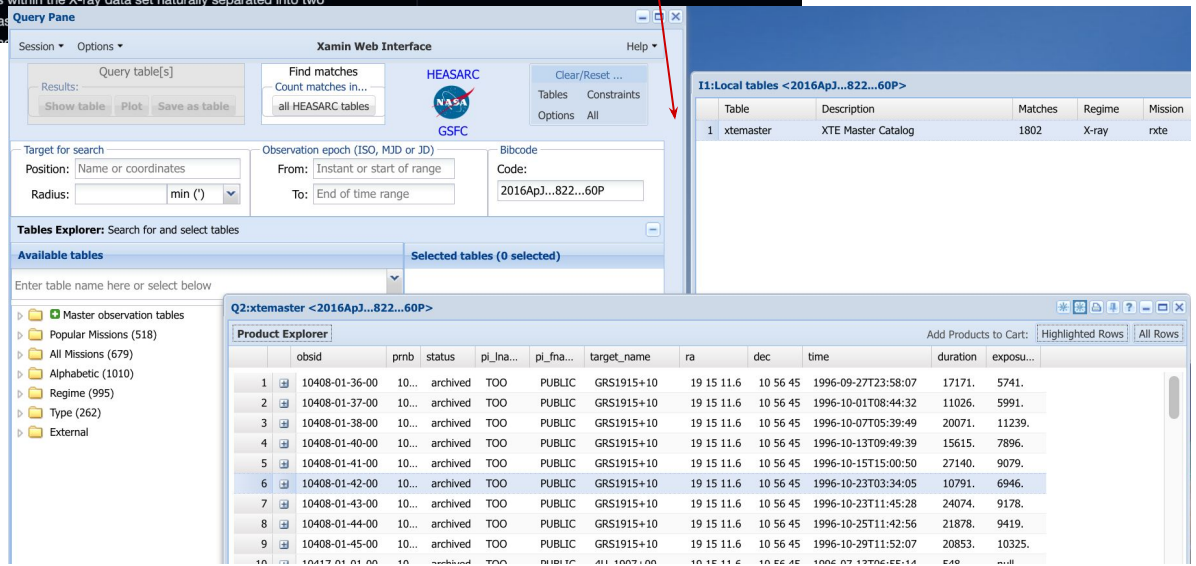
Xamin beta sneak peek



Bibliographic links



Go straight from ADS to browse the data products on HEASARC



And the reverse: from Xamin, you can get a list of linked bibcodes.

Command-line access and APIs:

- If you know what you want and where it is already (e.g., from the web portal), you can use our download script

```
download_wget.pl https://heasarc.gsfc.nasa.gov/FTP/nicer/data/obs/2018_01/1050020180/
```

- To find things, you can use the Xamin command-line java tool to run queries:

```
runquery table=rosmaster,ascamaster constraint='a.exposure>b.sis_exposure'
```

- In a Python session or notebook, you can use PyVO following examples on our website:

```
>>> print(example['QUERY'])
SELECT * FROM rosmaster WHERE exposure > 10000 AND 1=CONTAINS(POINT('ICRS', ra, dec),CIRCLE('ICRS', 50, -85, 1))
>>> result=example.execute()
```

__row	seq_id	ra	dec	lii	bii	instrument	filter	site	exposure	requested_exposure	fits_type	start_ti
		degree	degree	degree	degree				s	s		n
object	object	float64	float64	float64	float64	object	object	object	int32	int32	object	float
1	RH202299A01	49.3200	-85.5400	299.8517	-30.6815	HRI	N	MPE	43683	70000	RDF 3_6	50324.74253472
2	RH202299N00	49.3200	-85.5400	299.8517	-30.6815	HRI	N	MPE	36146	70000	RDF 4_2	50174.49619212

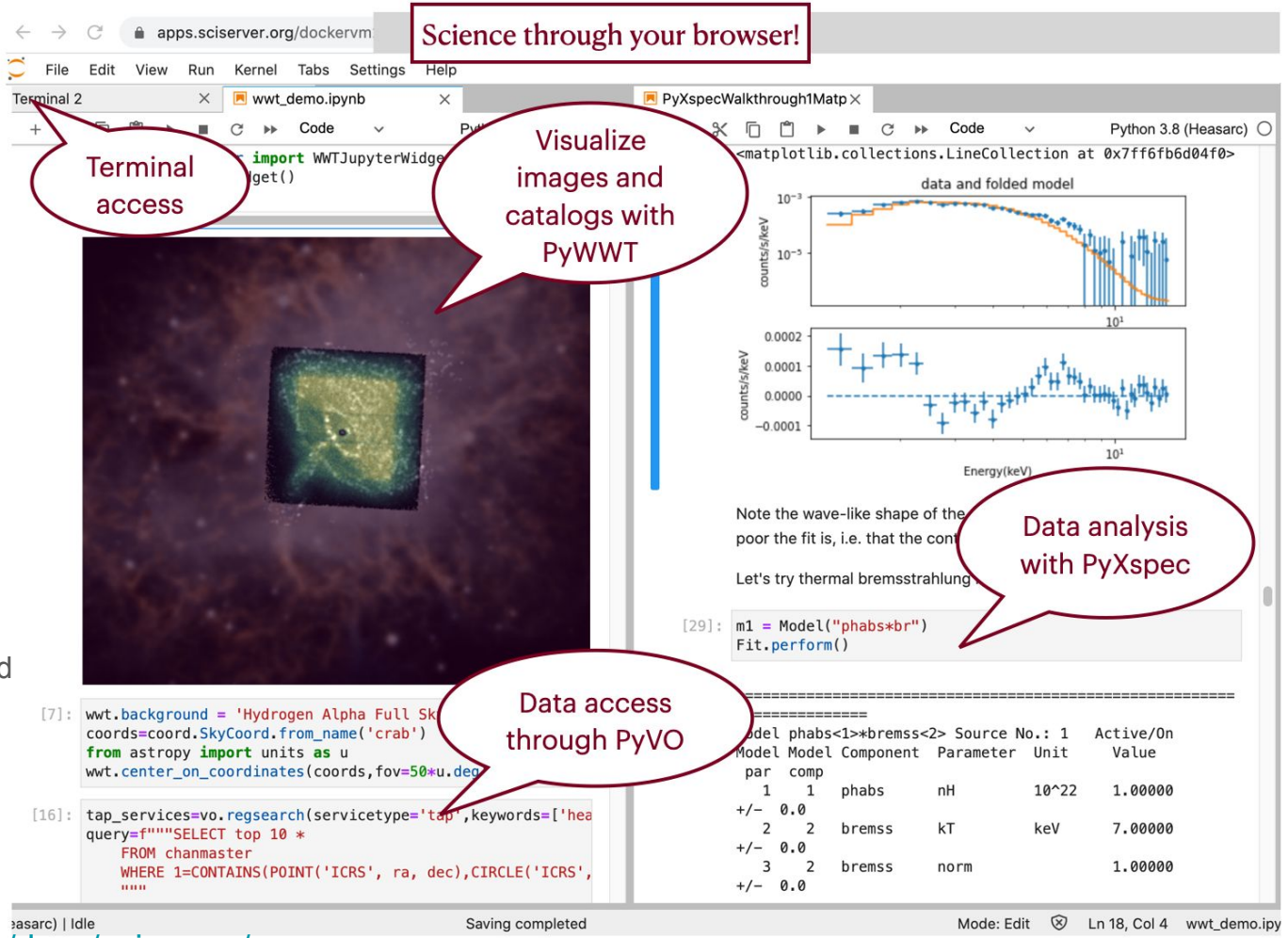
Software

- HEASoft
  - Generic and mission-specific tools for high energy astrophysics data analysis.
  - Use our Dockerfile
  - Or use our science platforms (see below)
- Heasoftpy
  - Script in Python
  - Share as Jupyter notebooks
  - Start from tutorials
- Caldb
  - Keep up-to-date with the latest calibration
- Astro-update
  - Keep your other astronomy software up to date

```python
import heasoftpy as hsp
hsp.fdump(infile='input.fits', outfile='STDOUT', ...)

# or
params = {
    'infile': 'input.fits',
    'outfile': 'STDOUT',
    ...
}
hsp.fdump(params)

# or
fdump_task = hsp.HSPTask('fdump')
fdump_task(infile='input2.fits', outfile='STDOUT', ...)
hsp.fdump(fdump_task)

# or
fdump_task = hsp.HSPTask('fdump')
fdump_task.infile = 'input2.fits'
fdump_task.outfile = 'STDOUT'
... # other parameters
fdump_task()
```

Science platform: SciServer

- Do science through your browser
  - No data downloads
  - No software builds
  - Just create an account and go.
- Replaces existing Hera interface.
- Coming soon to Amazon Web Services with more available data from beyond HEASARC.

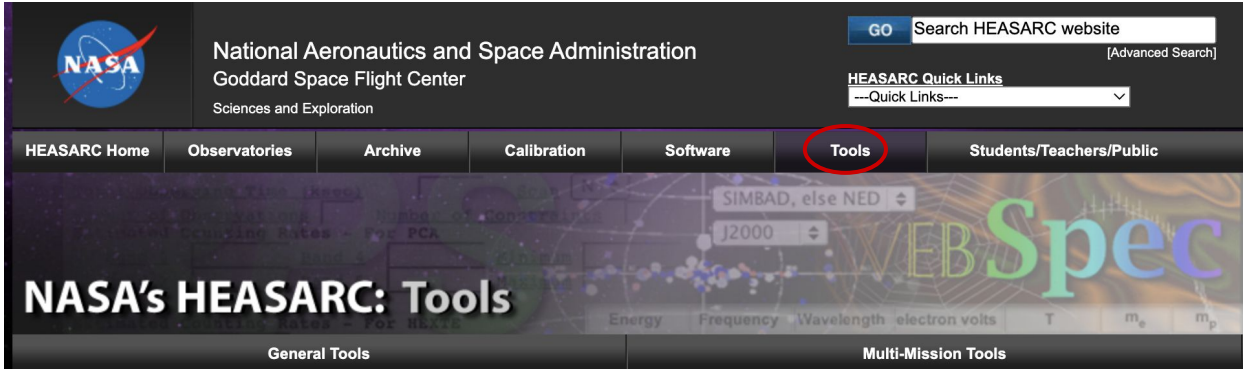


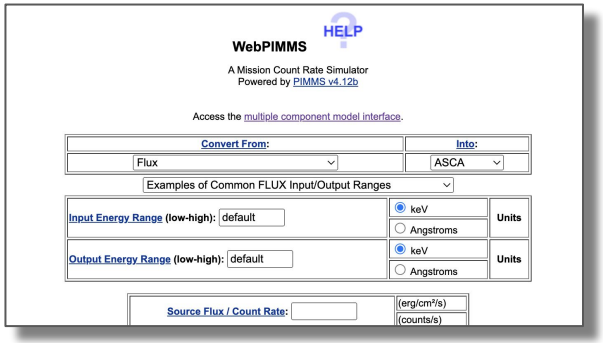
https://Sciserver.org

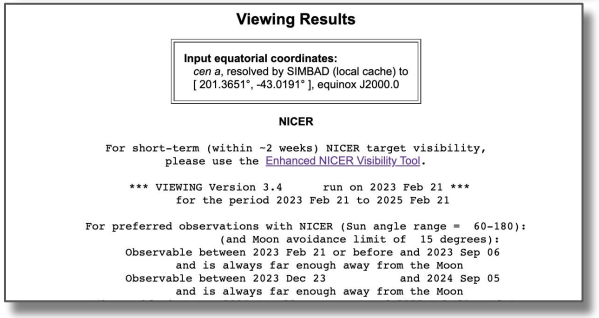
https://heasarc.gsfc.nasa.gov/docs/sciserver/

Proposal support

- ARK/RPS
  - Standard proposal submission system for HEA missions
- (Web)PIMMS
  - Portable, Interactive, Multi-Mission Simulator
  - i.e., what S/N will I get for my source?
- Viewing
  - When can which instruments see my source?

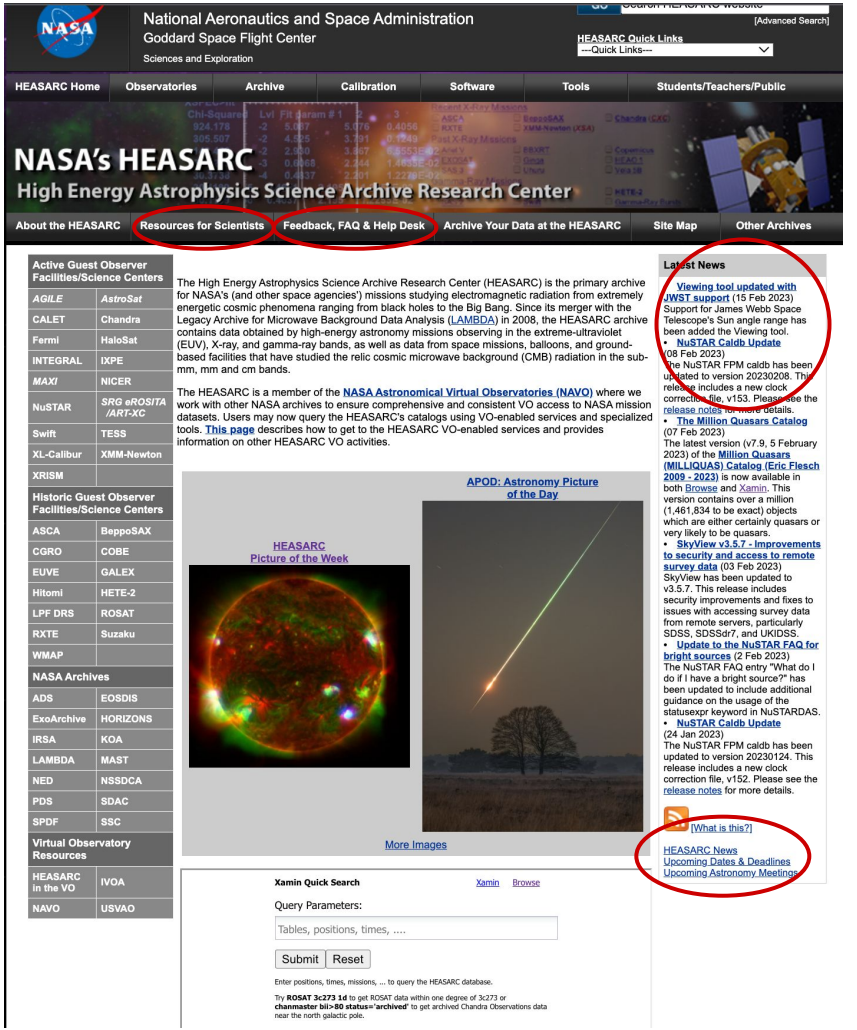






Community

- News
  - Subscribe via RSS
- Conference listings
- Proposal deadlines
  - Subscribe to our calendar!
- HEACIT
  - Community-run, HEASARC-supported
- Helpdesks
  - Mission-specific
  - Tool-specific
  - HEASoft
  - General
- APOD and ……
- Social
  - Facebook for Xspec
  - Astropy.slack.com channel ‘pyvo’ for Pythonic data access
  - GitHub (HEASARC and NASA-NAVO organizations)
    - Jupyter notebook tutorials
- Workshops
  - Regular AAS workshops on accessing data through Python
  - **Upcoming HEAD meeting special session/workshop on HEASARC!**



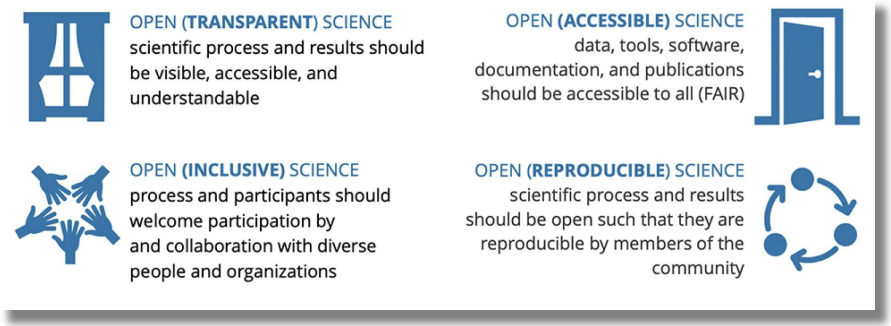
Open science support

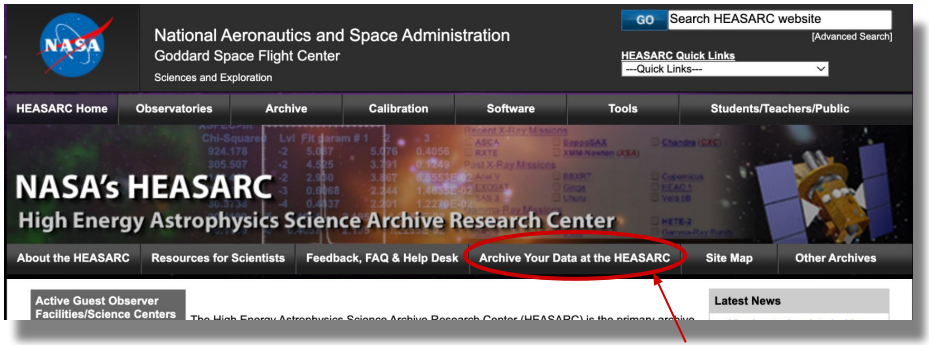
- NASA recently updated its Scientific Information Policy, i.e., SPD41a:
  - new requirements on data and software release from future NASA-funded research;
  - Implementation details still TBD.
- 2023 is NASA's Year of Open Science.
- HEASARC is learning how to help our community follow the new rules and best practices.

SCIENCE MISSION DIRECTORATE POLICY
Scientific Information Policy for the Science Mission Directorate

SMD Policy Document SPD-41a

September 26, 2022





Where to go for help

To follow up:

- Give us feedback on anything!
- Try out Xamin, SciServer, heasoftpy, etc. if you haven’t already.
- Contact us from our feedback form
- Come to our special session / workshop at HEAD in Hawai’i next month for hands-on interactive help.

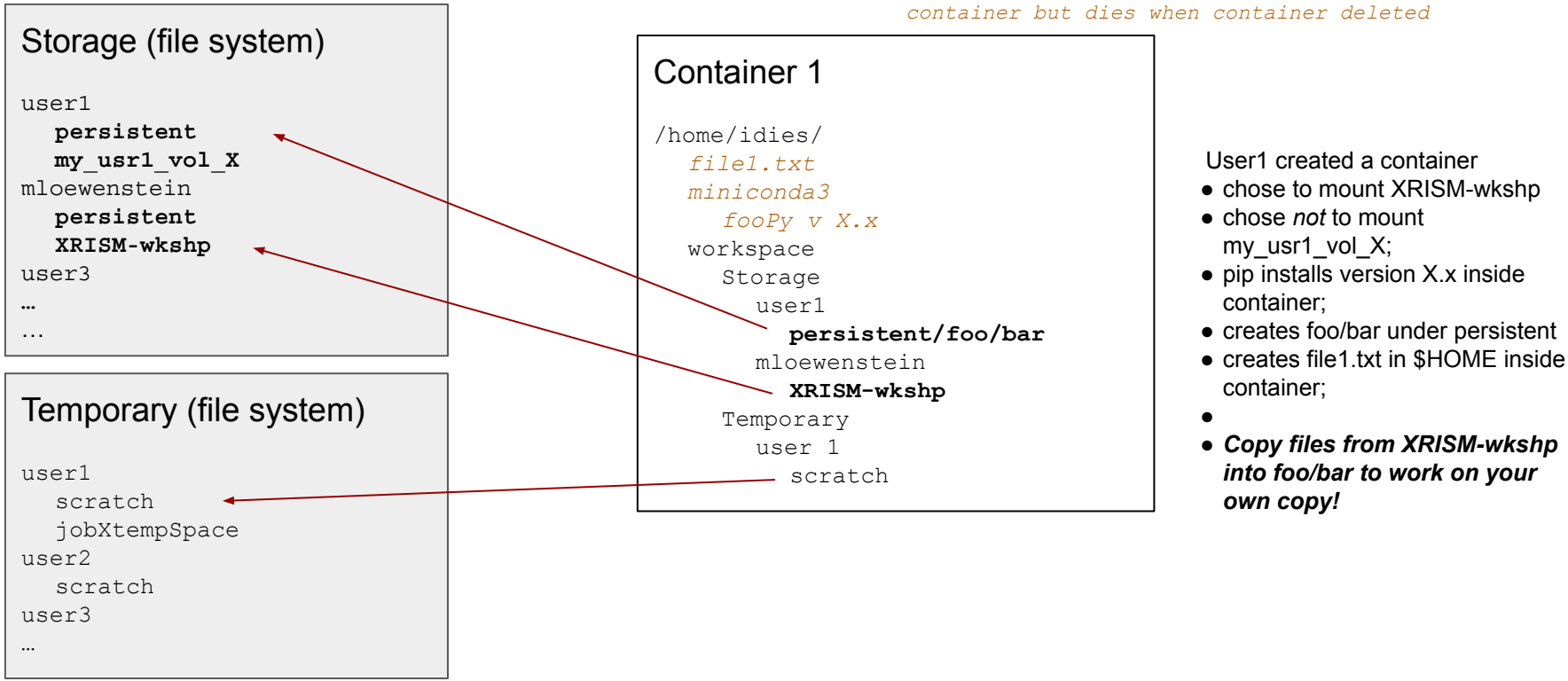
And

- Talk to us today!

backup

Storage and files on SciServer

- **Exists outside container, backed up, quota'd**
- Exists outside container, not backed up, not quota'd, may disappear
- *Exists only inside container, saved with stopped container but dies when container deleted*



User1 created a container

- chose to mount XRISM-wkshp
- chose *not* to mount my_usr1_vol_X;
- pip installs version X.x inside container;
- creates foo/bar under persistent
- creates file1.txt in $HOME inside container;
-
- ***Copy files from XRISM-wkshp into foo/bar to work on your own copy!***

Storage and files on SciServer

- **Exists outside container, backed up, quota'd**
- Exists outside container, not backed up, not quota'd, may disappear
- *Exists only inside container, saved with stopped container but dies when container deleted*

Storage (file system)

```
user1
   Persistent
   my_usr1_vol_X
user2
   persistent
   project_Y_shared_space
user3
…
…
```

Temporary (file system)

```
user1
   scratch
   jobXtempSpace
user2
   scratch
user3
…
```

Container 2

```
/home/idies/
   miniconda3
      fooPy v Y.y
   workspace
      Storage
         user1
            persistent/foo/bar
            my_usr1_vol_X
      Temporary
         user1
            scratch
            jobXtempSpace
```

User1 creates a container

- (maybe from the same base image, maybe not);
- chose to mount my_usr1_vol_X;
- chose to mount jobXtempSpace;
- pip installs version Y.y;
- note that file1.txt created in container 1 is NOT in HOME of container 2 because it was not put in the storage area.