

ESASky v2.0: spectra, Solar System objects and more (mobile & python)

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Goal: to facilitate data discovery and archival science for ALL users

- Multi-wavelength
- Project agnostic
- Exploration



Interface “on top of” all ESA astronomy archives

ESASky - sky.esa.int

Legacy: IUE, Hipparcos		XMM-Newton	Chandra (NASA)	HST	Gaia	Planck	ISO	Integral	EXOSAT	SUZUKU (JAXA)	Future: JWST, Euclid, ..
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ESASky data contents roadmap

Prototype
(summer 2014)

- **All-sky HiPS mosaics:**
 - XMM-Newton (CDS)
 - HST (CDS)
 - Planck (CDS)
 - Herschel-SPIRE (ESA)
- **Science ready data (imaging):**
 - XMM-Newton
 - HST (core)
 - Herschel-SPIRE
- **Catalogs:**
 - 3XMM-DR4
 - XMM Slew
 - XMM OM



First Release
(May 2016)

- **All-sky HiPS mosaics:**
 - EXOSAT (ESA)
 - INTEGRAL (ESA)
 - XMM-Newton (ESA)
 - HST (ESA)
 - ISO (ESA)
 - AKARI (ESA)
 - Herschel (ESA)
 - Planck (ESA)
 - JAXA/SUZAKU
- **Science ready data (imaging):**
 - INTEGRAL
 - XMM-Newton
 - HST
 - ISOCAM
 - Herschel
 - JAXA/SUZAKU
- **Catalogs:**
 - 3XMM-DR5
 - XMM Slew
 - XMM OM
 - Hubble Source catalog
 - Hipparcos
 - AKARI catalogs
 - Planck catalogs



Second release
(October 2017)

- **All-sky HiPS mosaics**
- **Science ready data (imaging and spectra):**
 - EXOSAT
 - INTEGRAL
 - XMM-Newton
 - IUE
 - HST
 - ISOCAM
 - Spitzer
 - Herschel
- **Catalogs:**
 - 3XMM-DR6
 - XMM Slew
 - XMM OM
 - Hubble Source Catalog v2.1
 - Hipparcos
 - Gaia
 - AKARI catalogs
 - Herschel Point Source Catalogs
 - Planck catalogs

Aim: continuous integration, testing and releasing

ESASky feature roadmap



Prototype (summer 2014)

- Web interface
- All-sky HiPS mosaics from CDS
- Detailed footprints (imaging)
- Multi-target functionality



First Release (May 2016)

- Scientific validation of footprints and ESA all-sky HiPS by ESA
- Download management
- Multi-target summary table
- Interoperability with VO tools
- Documentation
- Helpdesk Support
- Hardware scaling requirements
- Refactoring of prototype into robust and stable application



Second release (23 October 2017)

- Link to Vizier/Simbad
- Generation of detailed footprints (spectra)
- Imaging and spectroscopic data
- Online visualization of data
- Solar System Objects serendipitous search
- On demand overlaying of footprints for pre-planning



Third release (2017)

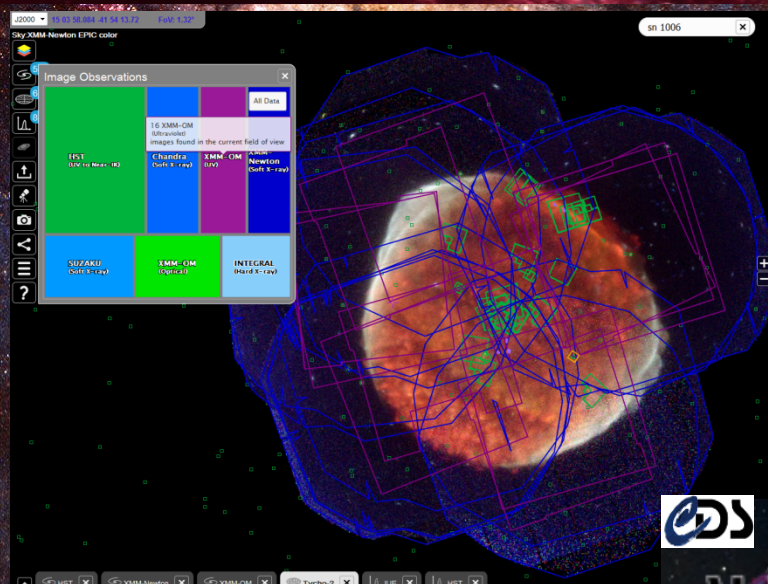
- Sample manipulation
- FITS on web
- Time-series
- Observation planning
- State-fullness
- Massive data visualization
- Link to publications?
- Mobile app?

Aim: continuous integration, testing and releasing




Collaboration is key

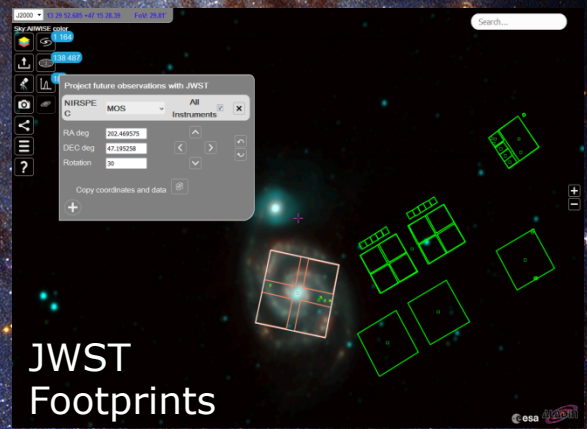
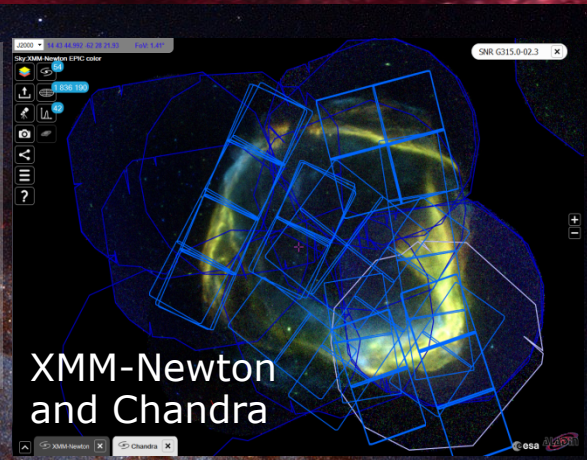
<http://sky.esa.int>




International Virtual Observatory Alliance



Standards: HiPS
SAMP  TAP
ObsCoreDM MOC



 Dedicated Python module to ESASky

ESASky : scalable system architecture

Public layer

- Main application entry-point**
- Dynamic load balancing system based on RR
 - Nodes can be added/removed on-the-fly



- Images server (HIPS)**
- Dynamic load balancing system based on RR
 - Nodes can be added/removed on-the-fly
 - Optional usage of the CDN

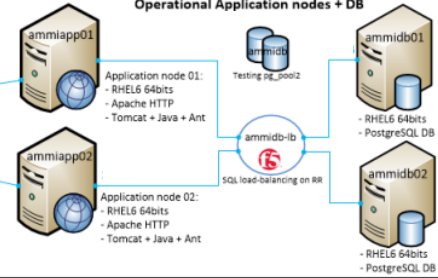


- Development application**
- Dynamic load balancing system based on RR
 - Nodes can be added/removed on-the-fly

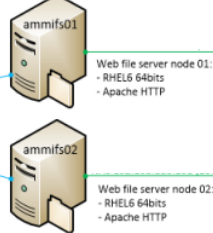


Application layer

Operational Application nodes + DB



Operational File server nodes



Integration Application node + DB



Development Application nodes + DB

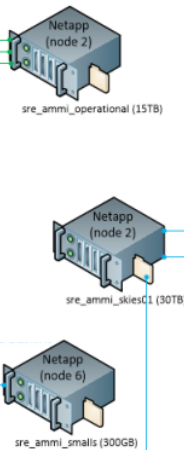


Development File server nodes

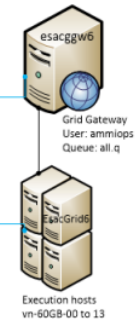


Data layer

Storage system (NetApp)



Grid Infrastructure EsacGrid6



Version 2.5 (2017-04-27)
R.Prieto, A.Lorca, SITU

Demos

<https://youtu.be/WKVuF0ypLQM?t=1h41m41s>

<https://youtu.be/eEBbqyagNUI?t=4h8m10s>

- Current ESASky v2.0
 - Spectra
 - Solar System objects
 - First mobile integration

- Future versions
 - Time-domain visualizations
 - VO data collections (via queries to TAP servers)
 - FITS on web

- We are open to all collaborations !! Please contact us !