ESA's future Astronomy Multi-Mission Interface

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Previous Collaborators: Iñaki Ortiz, Ignacio León, Andy Pollock, Michael Rosa

Acknowledge CDS Support: Pierre Fernique, Thomas Boch

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The Multi-Mission Interface

- **Goal**: to facilitate data discovery and archival science for ALL users
  - Multi-wavelength
  - Project agnostic
  - Exploration

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- Interface to all astronomy archives

- Current status is a first prototype

The Multi-Mission Interface (prototype)

Ingredients of first prototype:

- Access to data in individual archives
- All-sky (aka HiPS)
- Footprints

Use cases of first prototype:

- Explore multi-wavelength skies
- Single and multiple targets
- Images and catalogues only, selected mission

MMI people

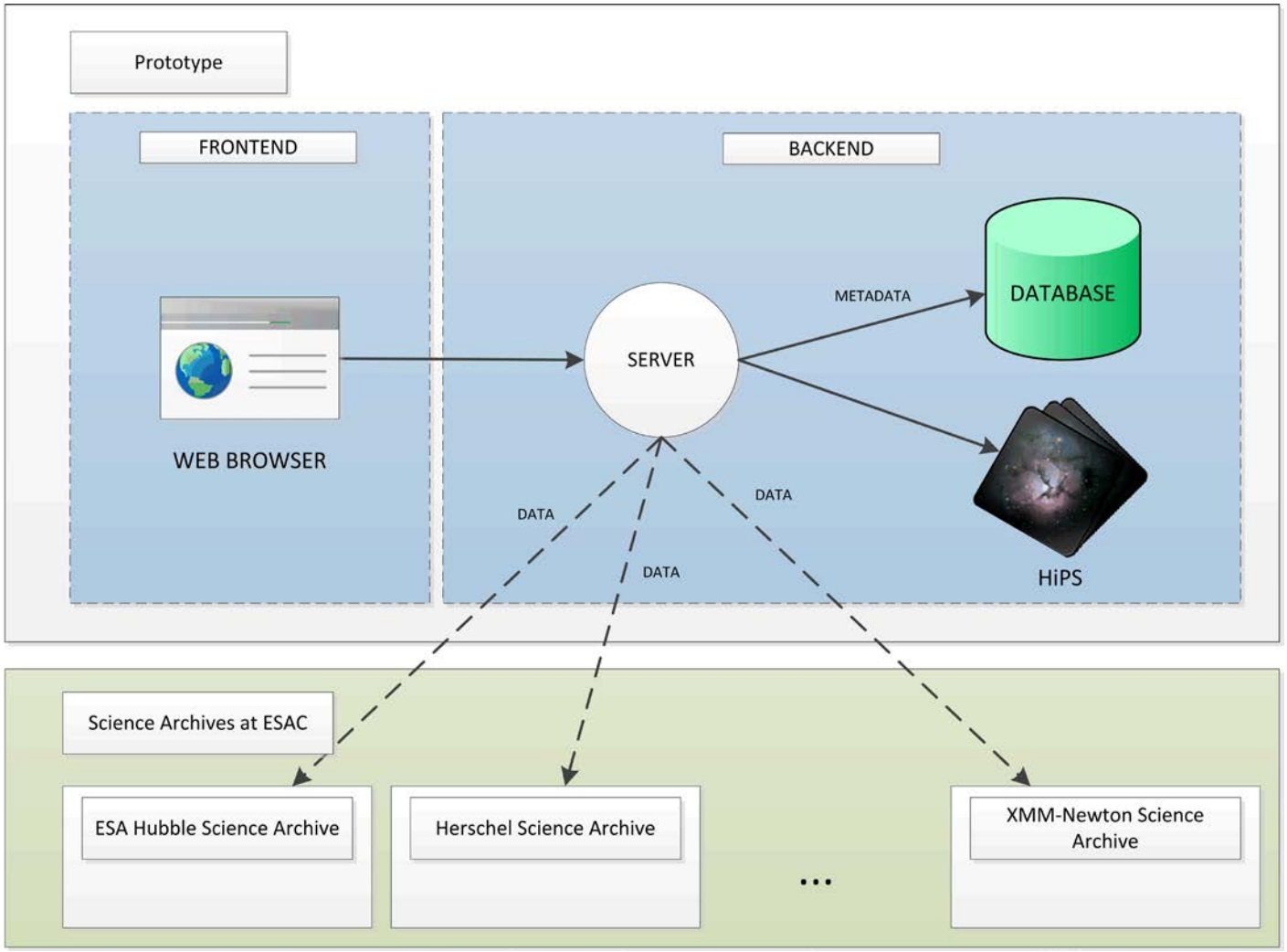
ESDC Astronomical Group

- Bruno Merín (astro archives science lead and MMI product owner)
- Jesús Salgado (astro archives technical lead)

MMI Team

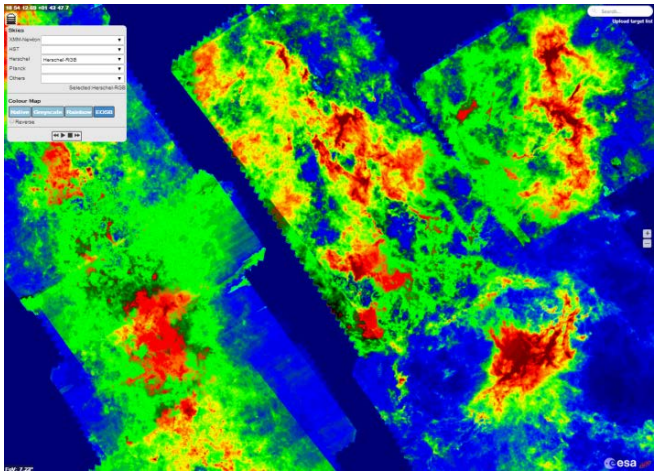
- Fabrizio Giordano (key person, full-time)
- Deborah Baines (science support)
- Elena Racero (part-time, HiPS and footprints)
- María Henar Sarmiento (part-time, GUI)
- Belén López Martí (full-time, HiPS development)

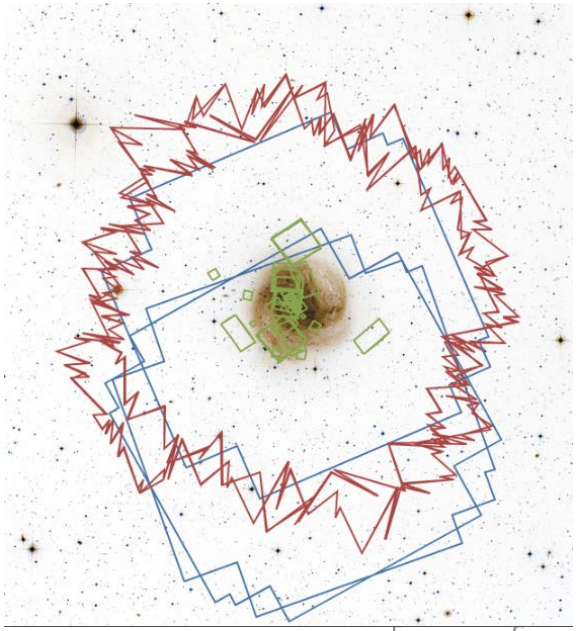
MMI Architecture



MMI Data

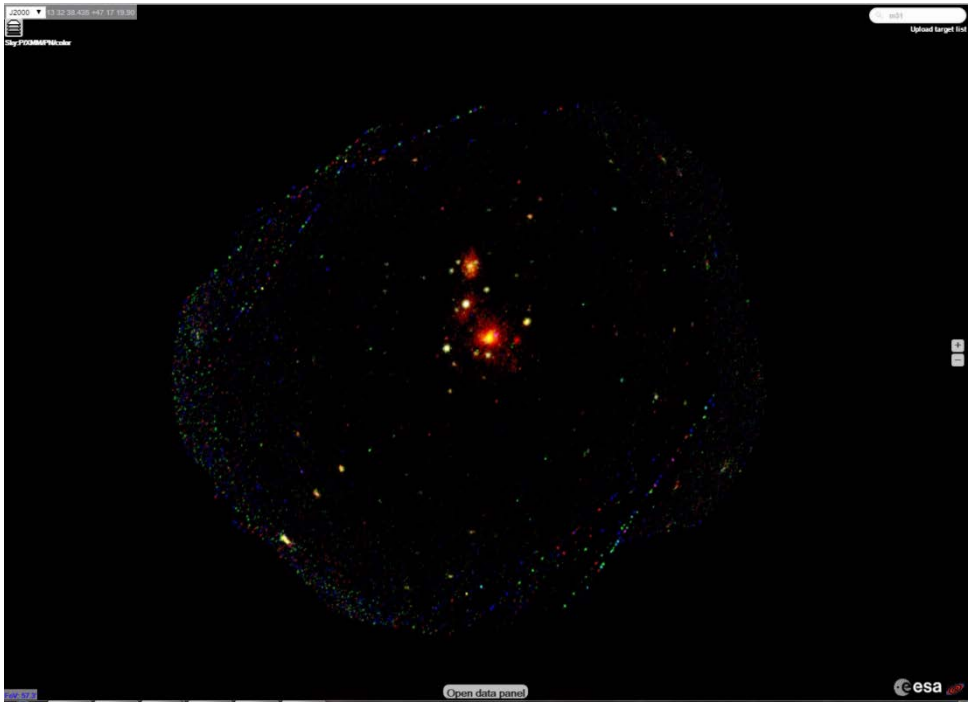
- HiPS: Hierarchical Progressive Survey (Fernique et al)
  - HEALPix sky tessellation
  - Number of levels depend on pixel angular resolution
  - IVOA standard:
    - Planck (low) 3 levels
    - Herschel (medium) 7 levels
    - HST (high) 14 levels
- Footprints
  - HST: Provided by project
  - Herschel: Footprint Finder (ST-ECF)
  - XMM: Instrumental + pointing

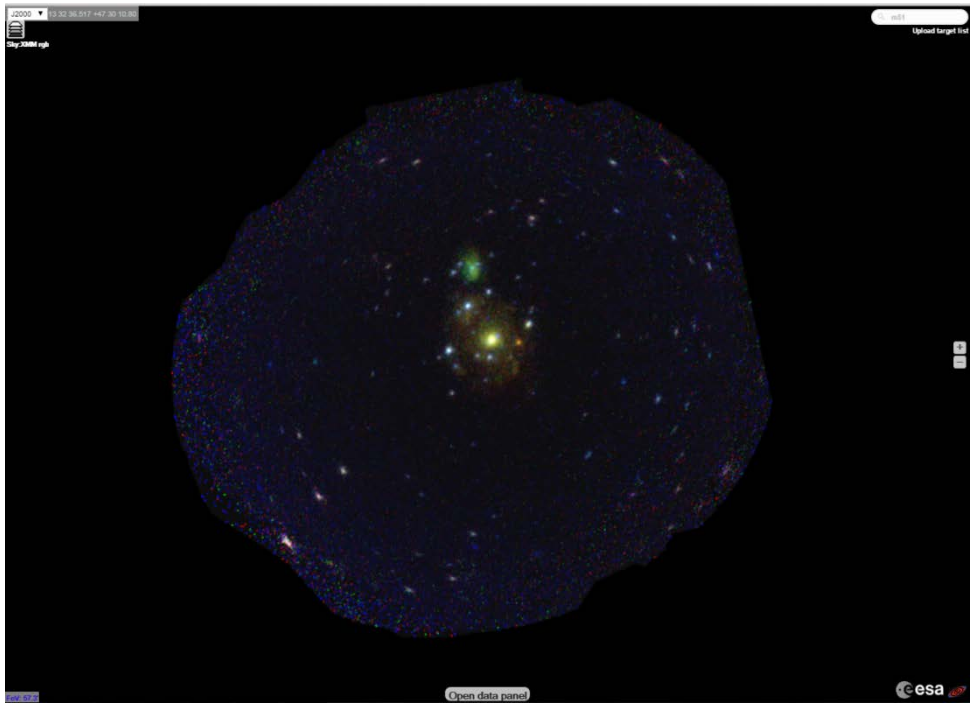




HiPS generation: Support from Projects

XMM-Newton HiPS -ESAC

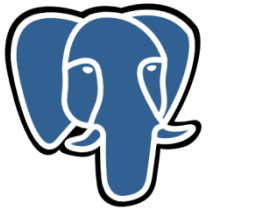




Credits: Pedro Rodríguez XMM-SOC, Elena Racero ESDC

Prototype – Backend Data Access

- Apache HTTP Server
  - Serves HiPS requests
- Java Servlet container
  - Serves TAP & Target Resolver requests
- Database
  - PostgreSQL DB
  - Spherical data types library (PgSphere)
  - Footprints -> Spherical data types
- Usage of IVOA Protocols & Standards
  - TAP requests
  - ADQL translation to SQL + PgSphere
  - Storage of STC-S footprint information



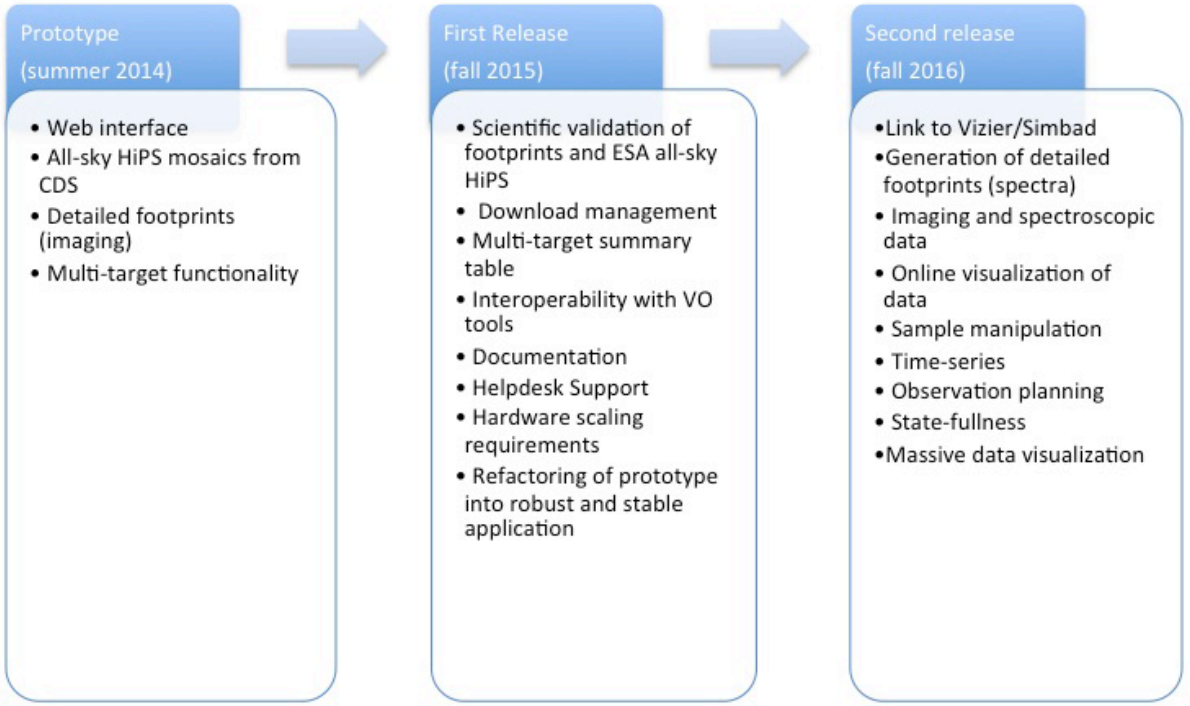
PostgreSQL

Prototype - Frontend

- Running on a Web Browser (HTML5/CSS3)
- Google Web Toolkit
  - Aladin Lite wrapper (JSNI)
  - Data Visualization (Highcharts)
- Usage of IVOA Protocols
  - TAP accessing archive metadata
  - STC-s describing complex FoVs
- Astronomical services access (Simbad)
  - Target coordinates resolver
  - Angular size resolver

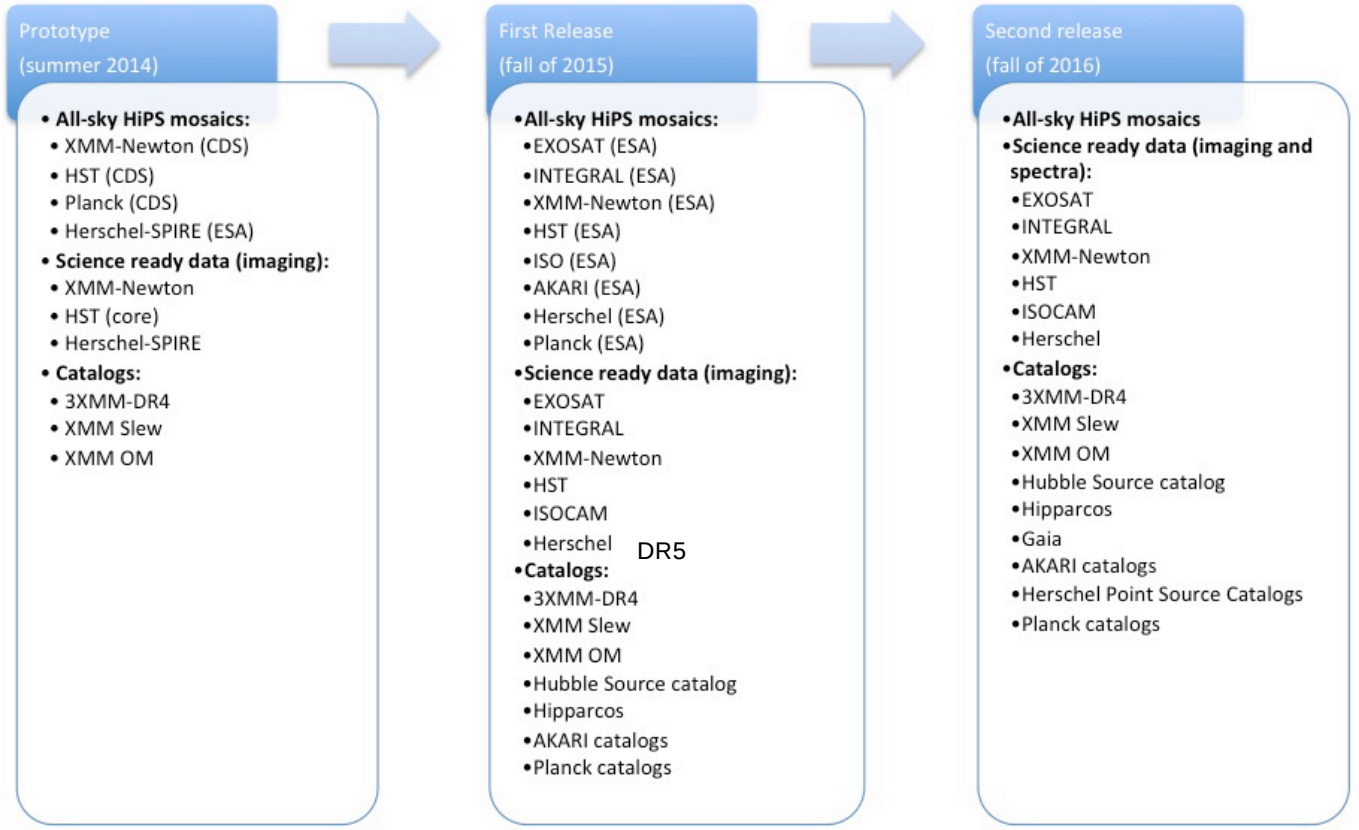
Multi-Mission Interface technology roadmap

ESA Astronomy Multi-Mission Interface Roadmap (technology)

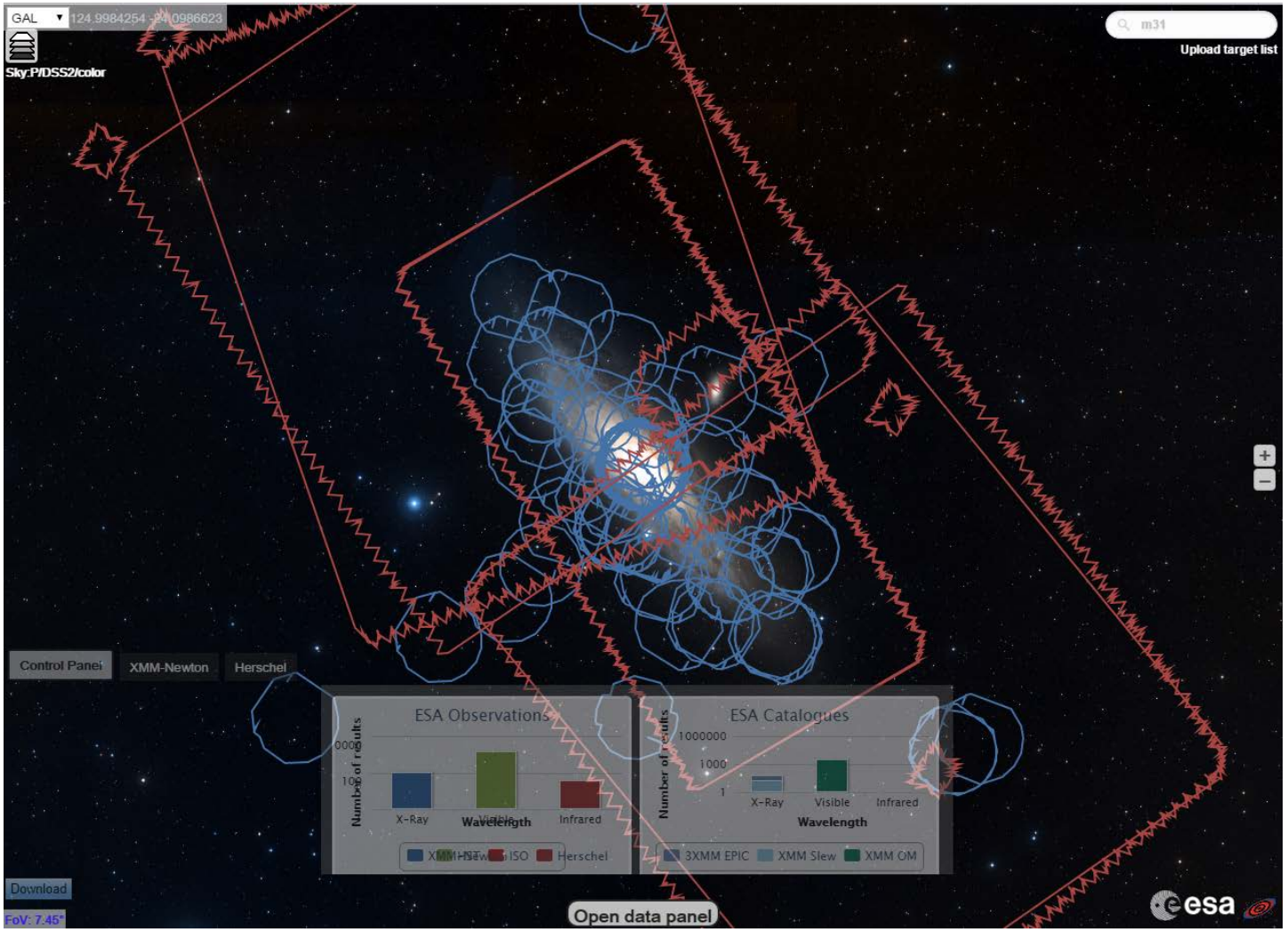


MMI data content roadmap

ESA Astronomy Multi-Mission Interface Roadmap (data contents)



MMI-Demo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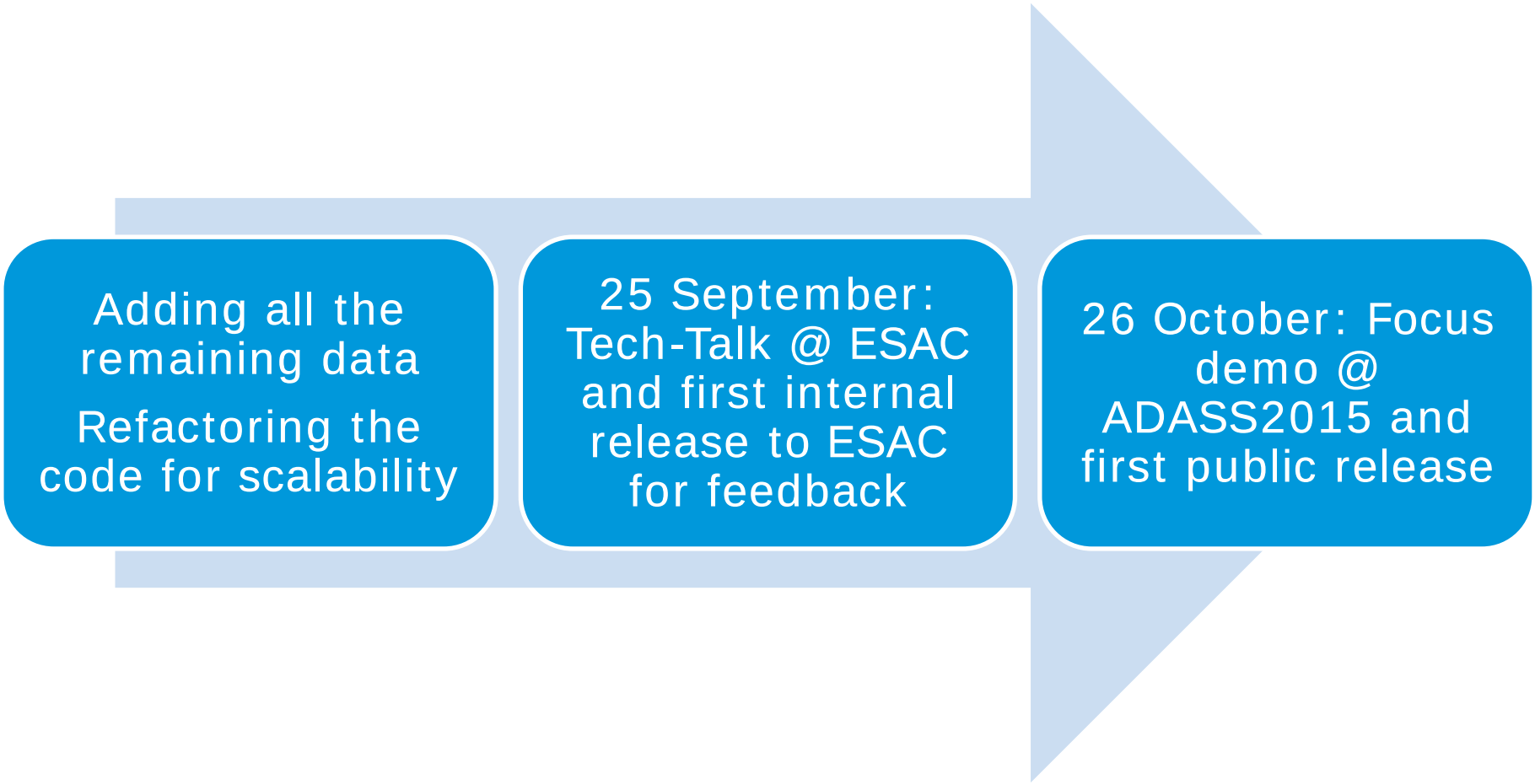
124.9984254 -24.0986623
Sky:P/DSS2/color
m31
Upload target list
Control Panel
XMM-Newton
Herschel
ESA Observations
Number of results
X-Ray
Visible
Infrared
Wavelength
Herschel
ESA Catalogues
1000000
1000
1
X-Ray
Visible
Infrared
Wavelength
3XMM EPIC
XMM Slew
XMM OM
Download
FoV: 7.45°
Open data panel
esa

MMI release timeline



THANK YOU

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