Discovering European Hubble Science Archive Data

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Introduction

The European Hubble Science Archive is located at ESAC Science Data Centre (ESDC), where it has been completely reengineered and redesigned, and it is now fully integrated with the rest of the ESA science archives for astronomical missions, to ensure long preservation and maintenance of the Hubble data: over 1.2 million observations from 10 different scientific instruments that conform a treasure of astronomical data.

All the public HST data, Hubble Legacy Archive and high-level science data products are available to the user from the from the European HST archive (EHST), released in October 2015. In addition to the dedicated archive, the ESDC offers Hubble Science Archive data from the ESASky tool, and the Hubble Source Catalogue into the Gaia Archive. Both visualization and science return possibilities become now greater than ever.

We present here all the means that the ESAC Science Data Centre offers to the astronomy community interested in Hubble Science Archive data, as well as the new features recently incorporated into the EHST.

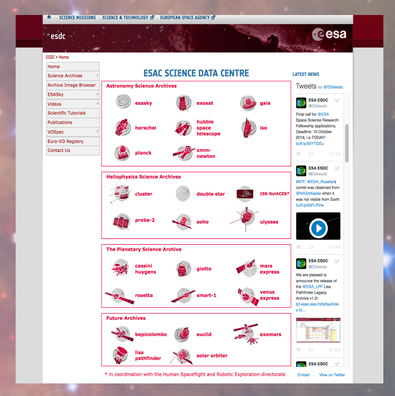
European Hubble Science Archive Data at the ESAC Science Data Centre

ESAC Science Data Centre

The ESAC Science Data Centre (ESDC) is responsible for the development and operations of the scientific archives for the Astronomy, Planetary and Heliophysics missions of ESA.

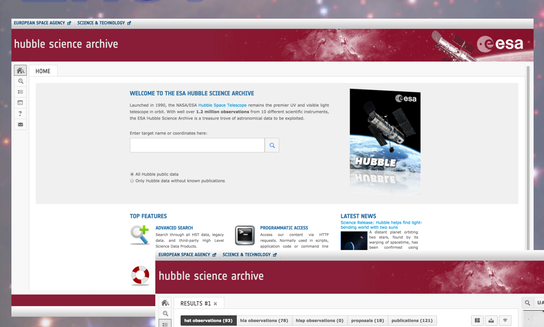
The ESAC Science Archives strategy includes enabling the maximum scientific exploitation of datasets, efficient long-term preservation of data, software and knowledge, using modern technology, and cost-effective archive production by integration in, and across projects.

HST data benefits directly from this infrastructure: Hubble Science data can be discovered in many flavours, including the dedicated archive, the European HST Archive, in a multimission tool where HST data is put in context with many other mission in several wavelengths, and in the newly Gaia Data Release 1, allowing the maximum scientific exploitation of the data.



http://www.cosmos.esa.int/web/esdc

EHST



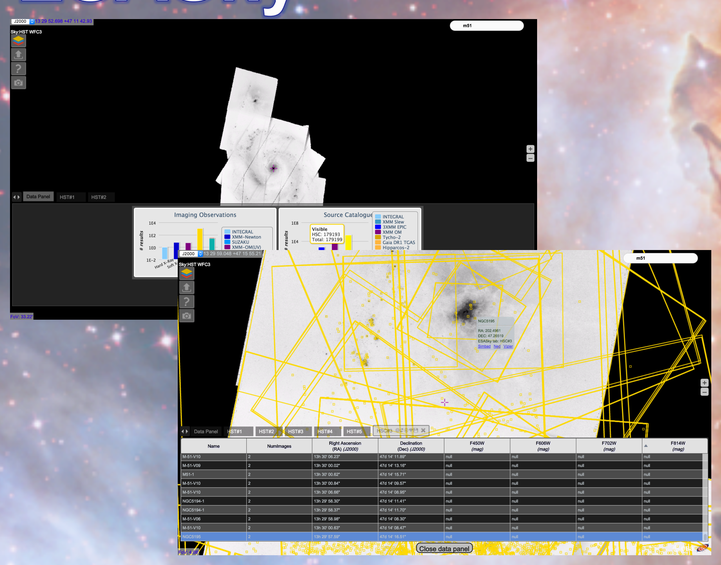
European HST Archive

Released in October 2015, it allows searching all the HST, HLA and HLSP collections of all public data that Hubble observes every day. Within the new Home page, users can directly access to all the observations which do not have any publication associated yet. Data can be retrieved via our Web interface or using the dedicated programmatic access.

Hubble Science Archive Data
Access to the three Hubble data collections: *HST*, the classic *HST* collection, *HLA*, the Hubble Legacy Archive, and *HLSP* the High Level Science data products collections. All of them are linked to their corresponding *Proposals* and *Publications*. Data continue being ingested at a daily basis in the archive and all VO services for images and spectra are now available.

http://archives.esac.esa.int/hst

ESASky



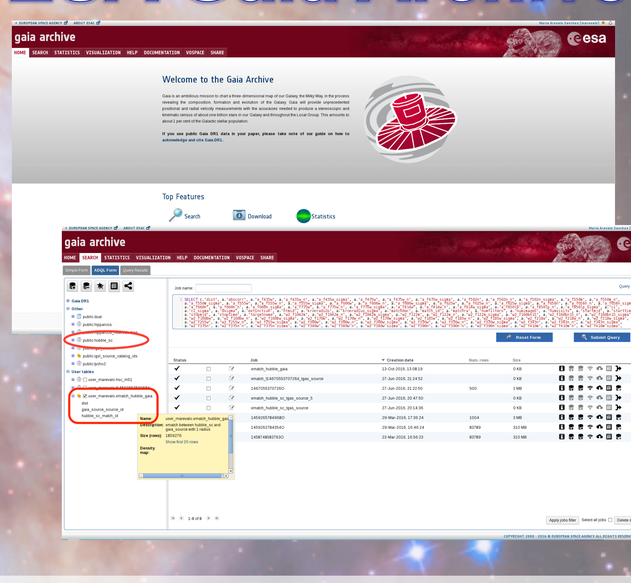
ESASky

Web application to explore multi-wavelength skies, intended for heterogeneous discovery of data from various science archives. It makes use of progressive multi-resolution all-sky projections using HiPS, developed at CDS, and detailed geometrical footprints connecting the all-sky mosaics to individual observations, and direct access to science-ready data at the underlying mission-specific science archives.

Hubble Science Archive Data
Hubble data is ready to be explored with ESASky, including HST, HLA and HLSP public observations, Hubble Source Catalog, and the HST HiPS maps created by grouping all available public images, in all broad bands from a given instrument (ACS, NICMOS, WFPC2, WFC3, COS, WFPC).

http://sky.esa.int

ESA Gaia Archive



ESA Gaia Archive

Gaia Archive at ESDC is the official repository of all Gaia data, including the recent and expected Data Release 1 of the Gaia Archive. It provides a powerful querying interface comprising a simple query form, advanced ADQL querying, upload of tables inside private user space and table sharing, among others.

Hubble Science Archive Data
Hubble Source Catalog v1.0 has been included in the Gaia Data Release 1 as an external catalog. This enables the user to benefit from the extensive information produced by Hubble mission using the powerful Gaia Archive querying capabilities. As shown in the snapshot, one click is enough to cross-match Hubble catalog with the entire Gaia source catalog. The resulting 1.86 million rows cross-match table is stored in the user local area for further querying and analysis.

https://archives.esac.esa.int/gaia

References

1. Arviset, C., “From ISO to Gaia: a 20-years journey through data archives management”, I1.1, ADASS 2016
2. Salgado J. et al, “ESASky: A simple/performant interface on massive astronomical data”, O2.3, ADASS 2016
3. Giordano, F. “ESAC Science Data Centre”, D5, ADASS 2016 Demo Booth
4. Merín, B. ¨ESA Sky: a new Astronomy Multi-Mission Interface¨, ADASS 2015

Conclusions

- The EHST offers easy and instant access to all the available HST data, including HST classic observations, the Hubble Legacy Archive (HLA) and other High-Level Science Products (HLSP).
- Developed following the common approach within the ESDC: a more robust archive easy to maintain and to extend.
- This common architecture allows exploitation of all the Hubble data collections in many flavours, from a multi-wavelength point of view in ESASky or comparing astrometry from the Hubble Source Catalog with the accuracy and precision of the Gaia Archive.

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