Status and ongoing work for the

INTEGRAL SCIENCE LEGACY ARCHIVE

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The long and winding road …

- INTEGRAL Science Management Plan (1994):
  One INTEGRAL data archive will be produced and maintained by the ISDC. An up-to-date version of the archive will also be available via the ISOC and the local science support centres.

- In practice: data provided via ISDC and local centres. Long-term effort to keep mirror archive at ESAC, but not made public.

- Various attempts over the years to set up working archive with added functionality at ESAC. Frozen from 2013 for cost savings.

- Some attempts to continue, e.g., **Roadmap for long-term legacy of INTEGRAL data analysis and products** by C. Ferrigno and P. Kretschmar provided to ESAC management in 2016.

- Restarted work on legacy archive in 2018 ➡ ISLA.

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INTEGRAL Science Legacy Archive (ISLA)
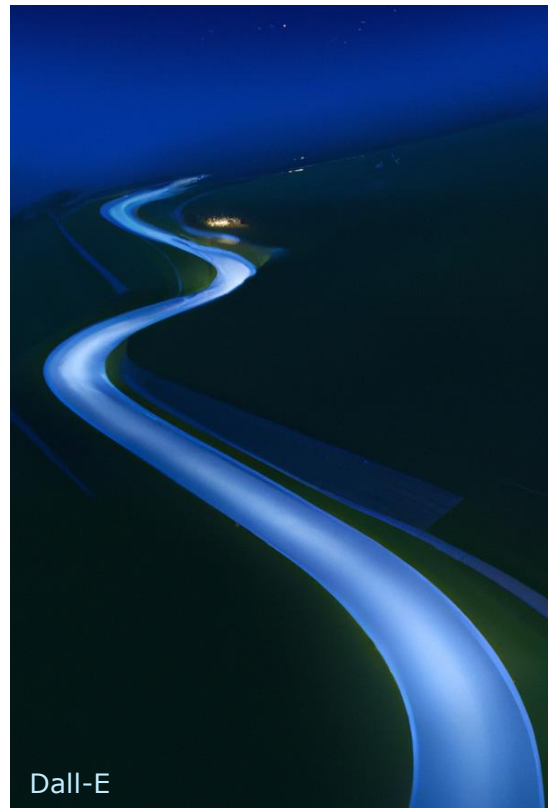
- Kick-off in November 2018, following EXPRO study.

- Effort guided very largely by Guillaume Bélanger working with general ESAC Science Data Centre Team.

- Main idea is to focus on science-ready, high-level data adapted to different source classes and access them via **Science Portals**. Currently defined (open for extension):

  - **AGN**
  - **Black Holes (Transients)**
  - **(Classical) Pulsars**
  - **Nucleosynthesis**
  - **Generic Point Source Explorer**

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ISLA prototype – work in progress

Current plans for contents in Science Portals

Point Sources	BHTs	AGN	Pulsars	Nucleo
All instruments	IBIS, JEM-X, SPI	IBIS, JEM-X	IBIS, JEM-X	SPI
	List of all BHs (All, LMXB, HMXB)	List of all AGN by type	List of all detected pulsars	List of nucleo special targets with products
Observation timeline	Observation timeline	Observation timeline	Observation timeline	All-sky published nucleo maps
Low-res full-mission time series and average spectra	Low-res full-mission time series	Low-res full-mission time series, average spectra and hardness ratios	Low-res full-mission time series	
	High-res GTI-based time series, hardness ratios and time-resolved spectra	High-res GTI-based time series and spectra of bright outbursts	High-res PIF-based event lists, pulse profile & on-pulse spectrum	
All-mission all-source mosaic	State-transition Q-diagrams	Population-based plots of hardness ratio, logN-logS, average low-res spectrum	Population-based plots of P-Pdot & hardness ratio	
Basic source info panel			Essential stats panel	

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External and Internal support

Current external Expert Points of Contact and providers of data

IBIS — Philippe Laurent

JEM-X — Jerome Chenevez; Gaurava K. Jaisawal

SPI and **Nucleo** — Thomas Siegert; Laurent Bouchet

OMC — Albert Domingo

Pulsars — Lucien Kuiper; Alessandro Papitto

DataLabs — Volodymyr Savchenko

ISGRI data products also provided by ISOC. Started by Guillaume Bélanger, now continued by Jari Kajava as part of SCO-04 contractor support.

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Activities since February

- Meeting with OMC team, agreeing on delivery of an updated catalogue of variable optical sources. OMC team has delivered an advanced draft ICD for the delivery.

- Meetings between ISDC Geneva and Data Science Team on plans to allow interactive processing within Datalabs for ISLA data.

- Coordination between ISOC and ISDC to avoid unnecessary replication of effort.

- First contact with SPI Team Toulouse on SPI data. Will meet in Toulouse on 24 May.

- Organised first user testing of ISLA prototype within ESAC contractor support.

Current Status and Active Development

- ISLA v.0.10 Interface allows to search and download public data

- 3-color mission-averaged IBIS and JEM-X mosaics

- Science-topic themed portals allow to visualize all-mission IBIS and JEMX time series at ScW resolution in 3 energy bands

- Processing of spectral products for all detected sources for IBIS/ISGRI (at Revolution time resolution)

- Automatic spectral modeling and display in the ISLA frontend

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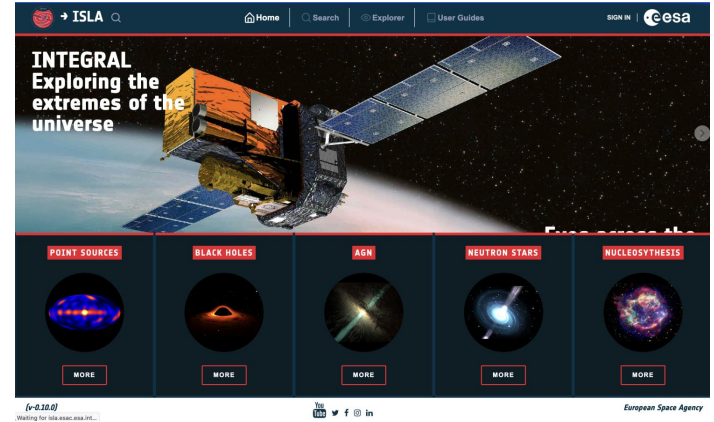
Future Development (coming 3 months)

- JEM-X spectral products, and joint modeling with ISGRI data

- Development of the black hole portal to include hardness-intensity diagrams and time-resolved spectral products

- Adding capability to download mosaics, time-series and spectral products.

- Improvements to the user interface based on first user testing reports.

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Further plans

- Working ISLA prototype before end of INTEGRAL science operations.

- Consolidate Science Portals and process to provide best data.

- Revive ISLA User Groups, discuss roles with respect to other groups, i.e., IUG, general Archive UG.

- Generally, increase dialogue with stakeholders.

- Specific project to incorporate interactive data processing within Datalabs in collaboration with ISDC.

- Detailed plans for post-operations wrap-up and enhancements.

- Incorporate new ESA Operations Scientist in ISLA process and hand over ISLA leadership.

Questions and comments are welcome!

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