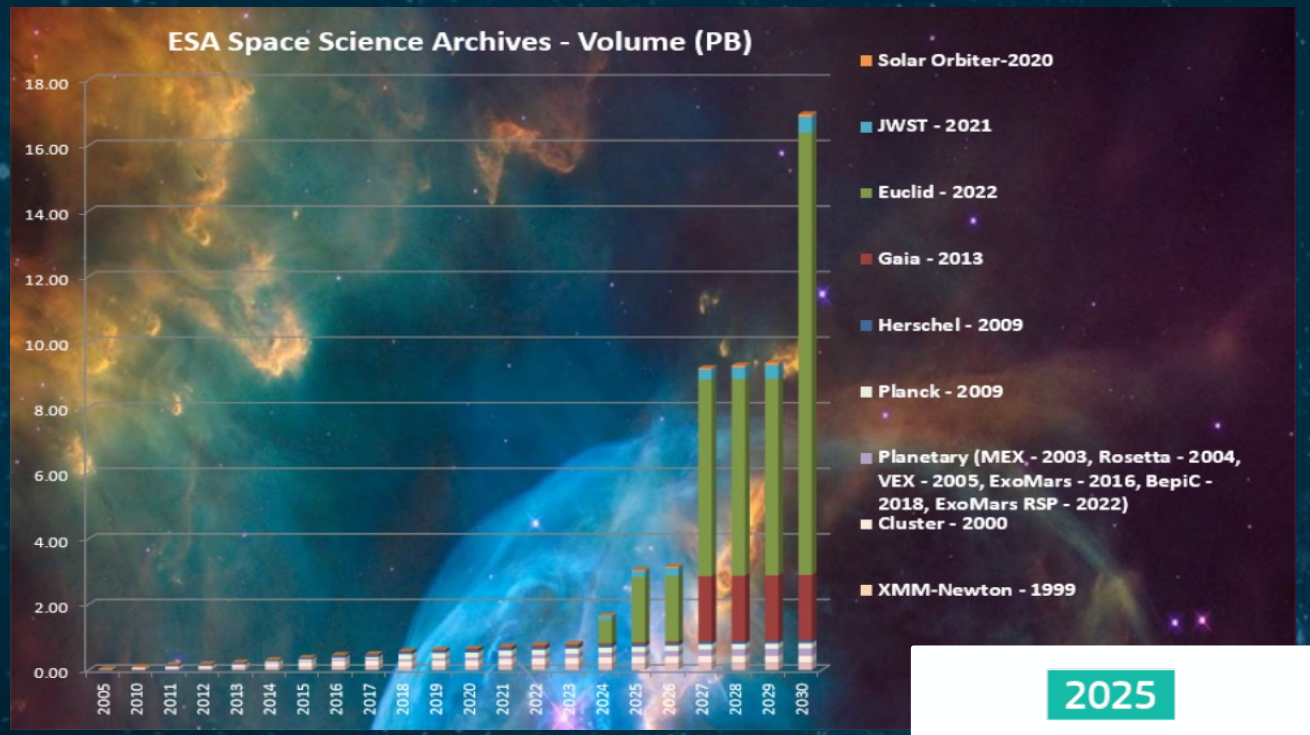
ESA Datalabs
Digital Innovation in Space Science and Beyond

Vicente Navarro

IHDEA Meeting, JHU/APL in Laurel MD & Virtual - Oct 12-13, 2023

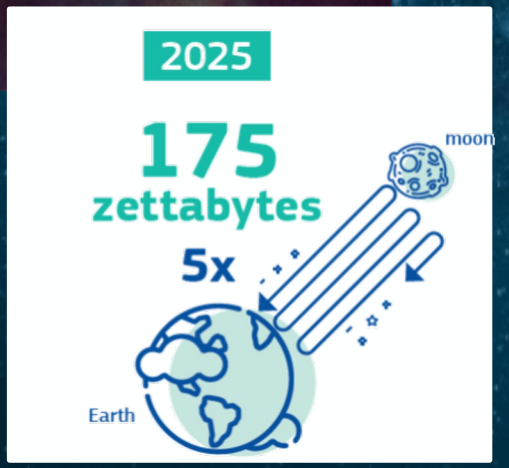
12/10/2023

Data Driven Science for a Data Informed World

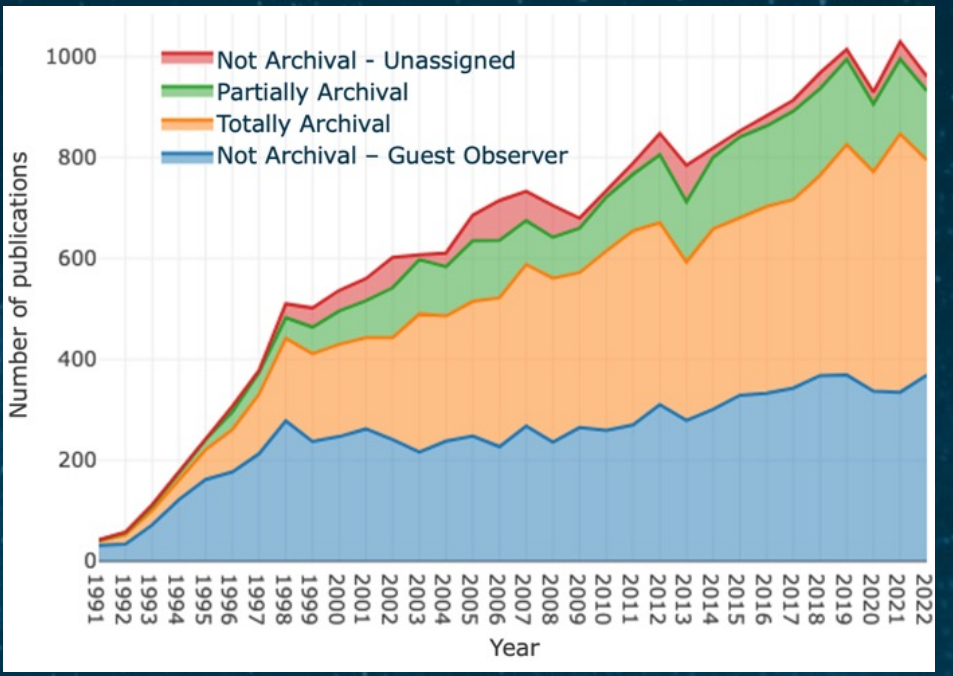


NASA & ESA

Data → Insights

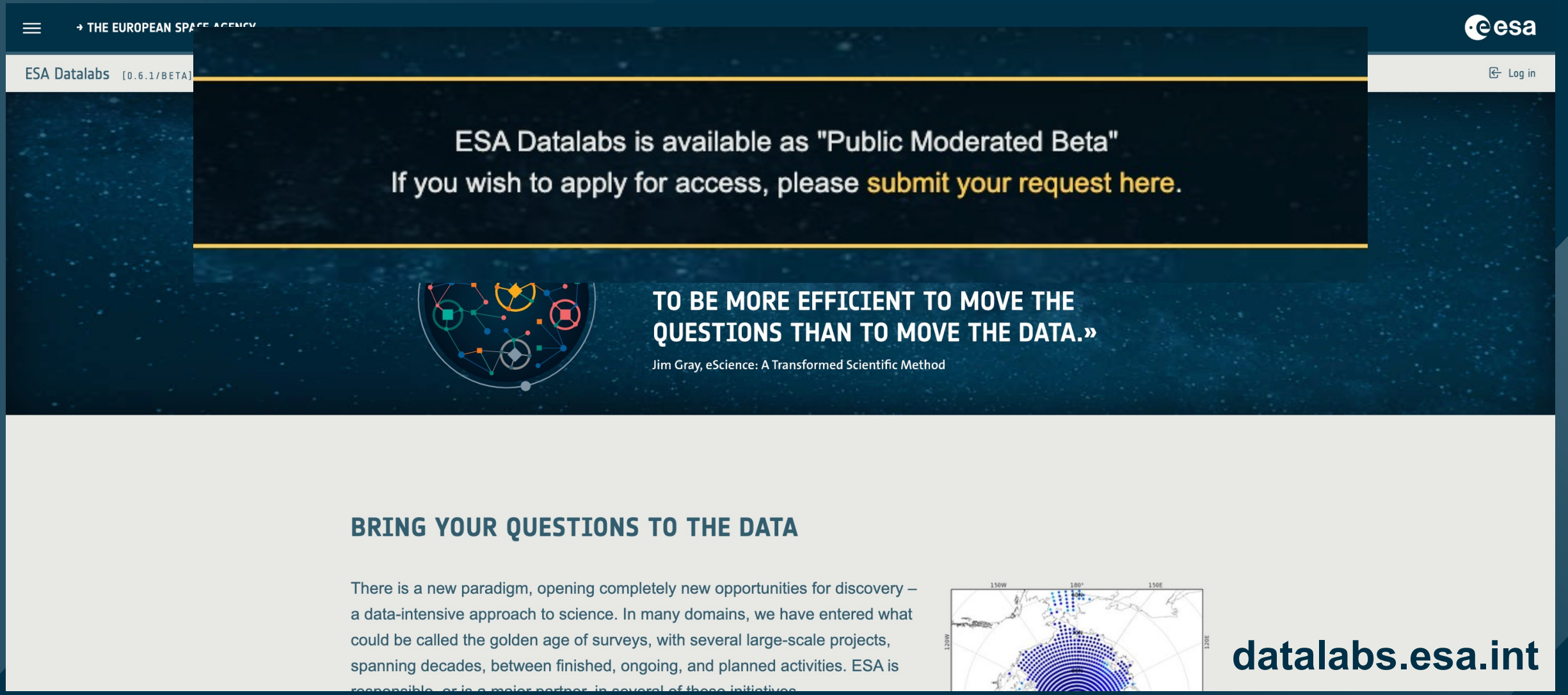


Stored on 512 GB tablets,
it would form five towers reaching the moon

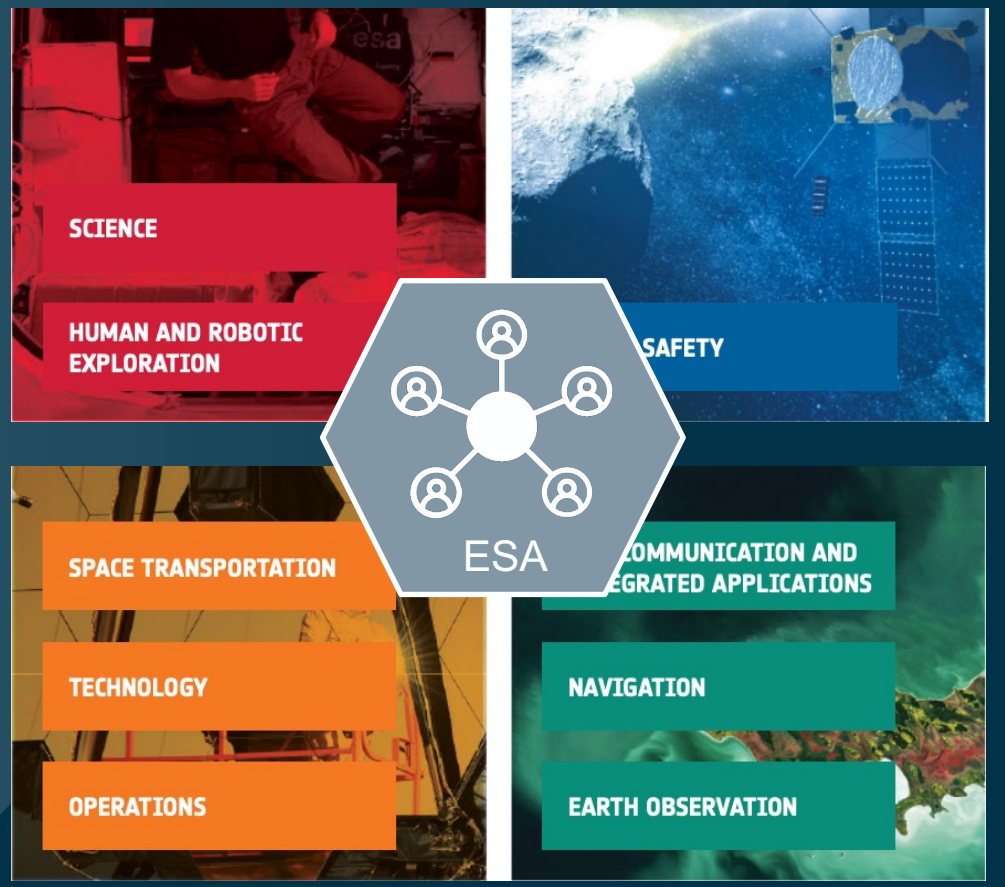


ESAC Science Data Center

ESA Space Science Proposal – ESA Datalabs



Multi-Domain & Multi-Mission Digital Platform



A Platform Designed to Boost Research Productivity

EDL users start here

Science Development

System Development

IT Development

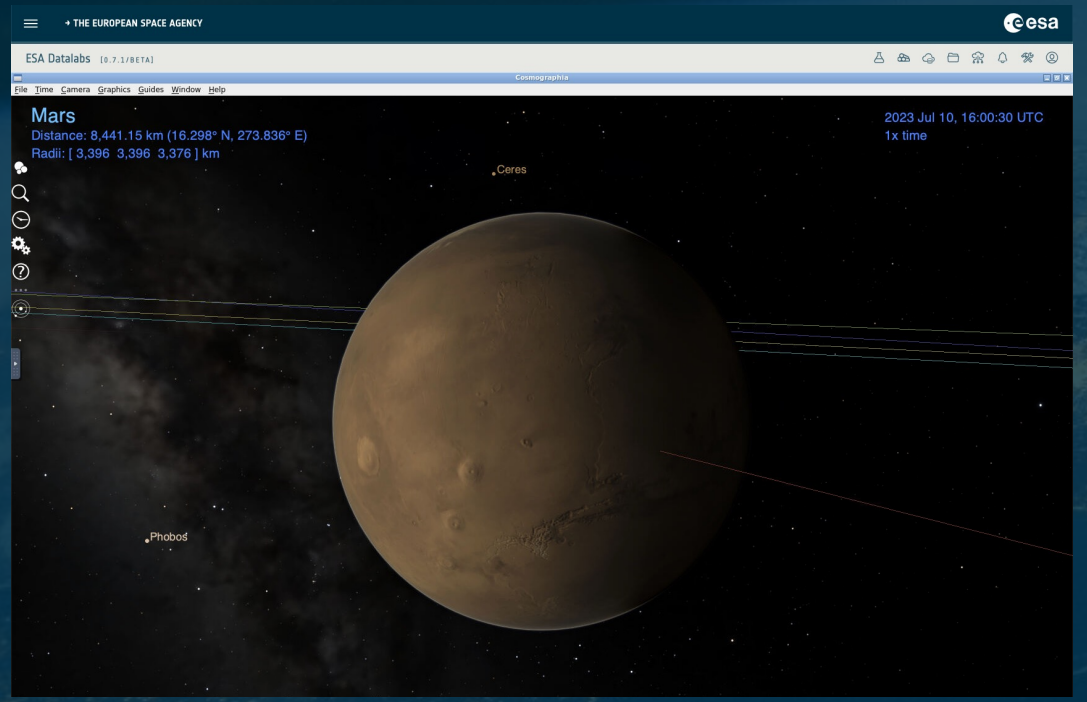
SaaS

PaaS

IaaS

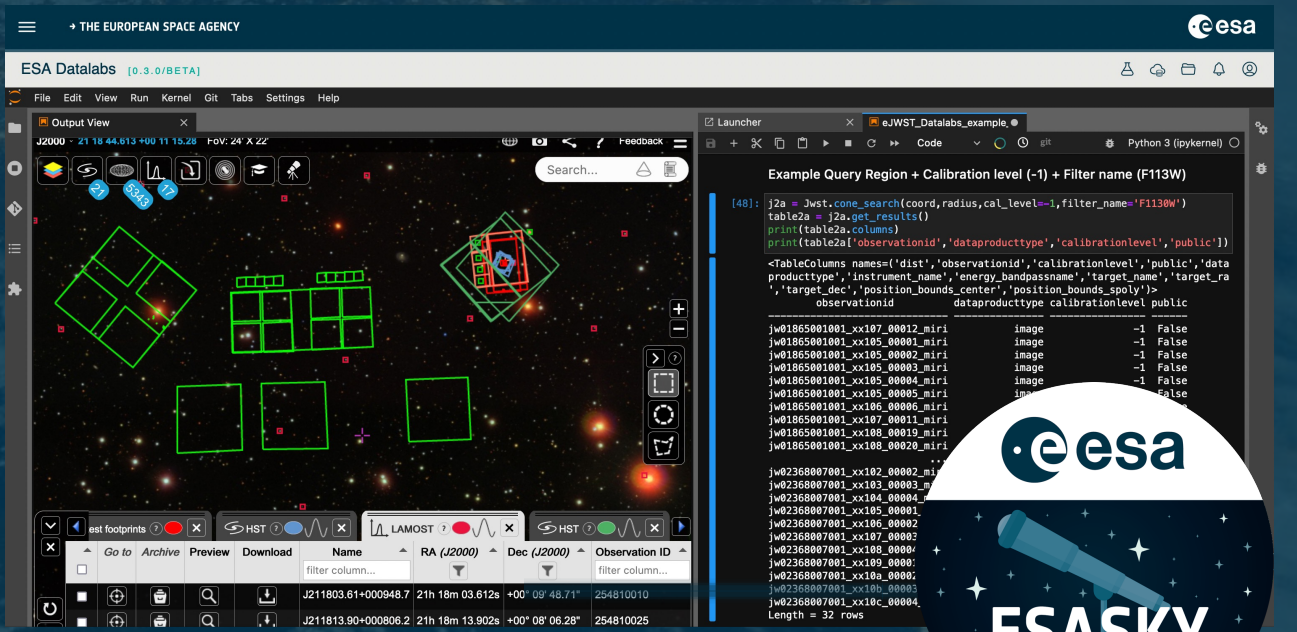
Software as a Service solution, low-code platform based on highly scalable microservice architecture

Datalabs for Interactive Analysis



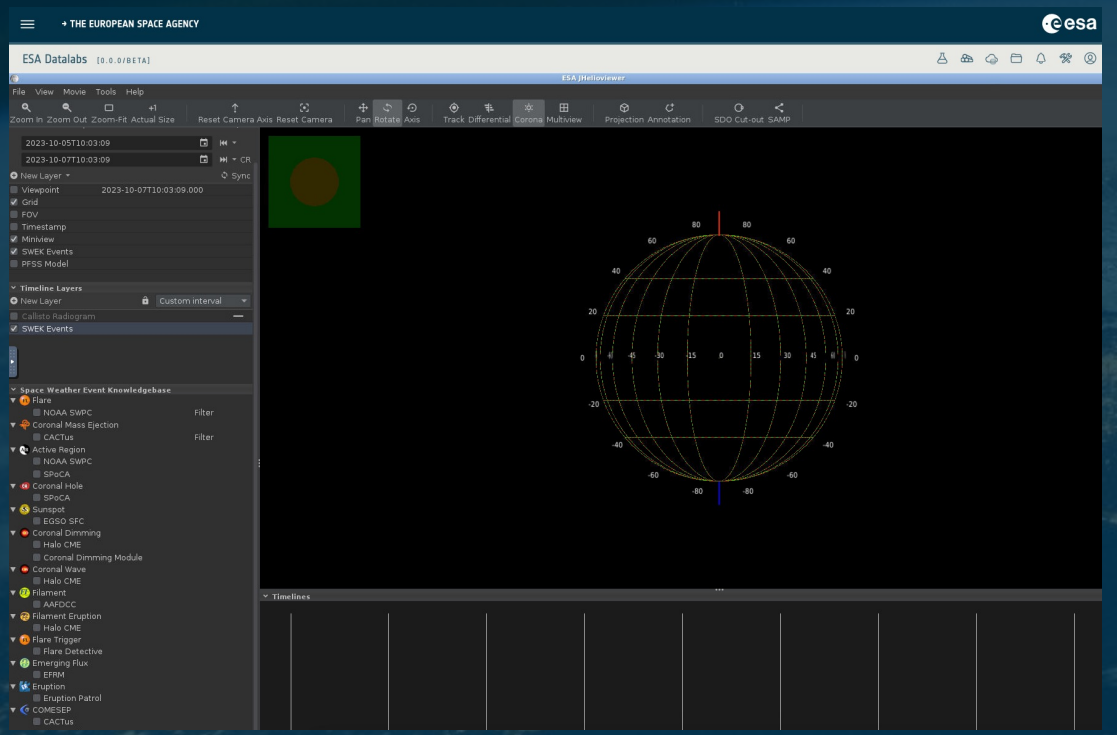
Desktop-Based

Web-Based



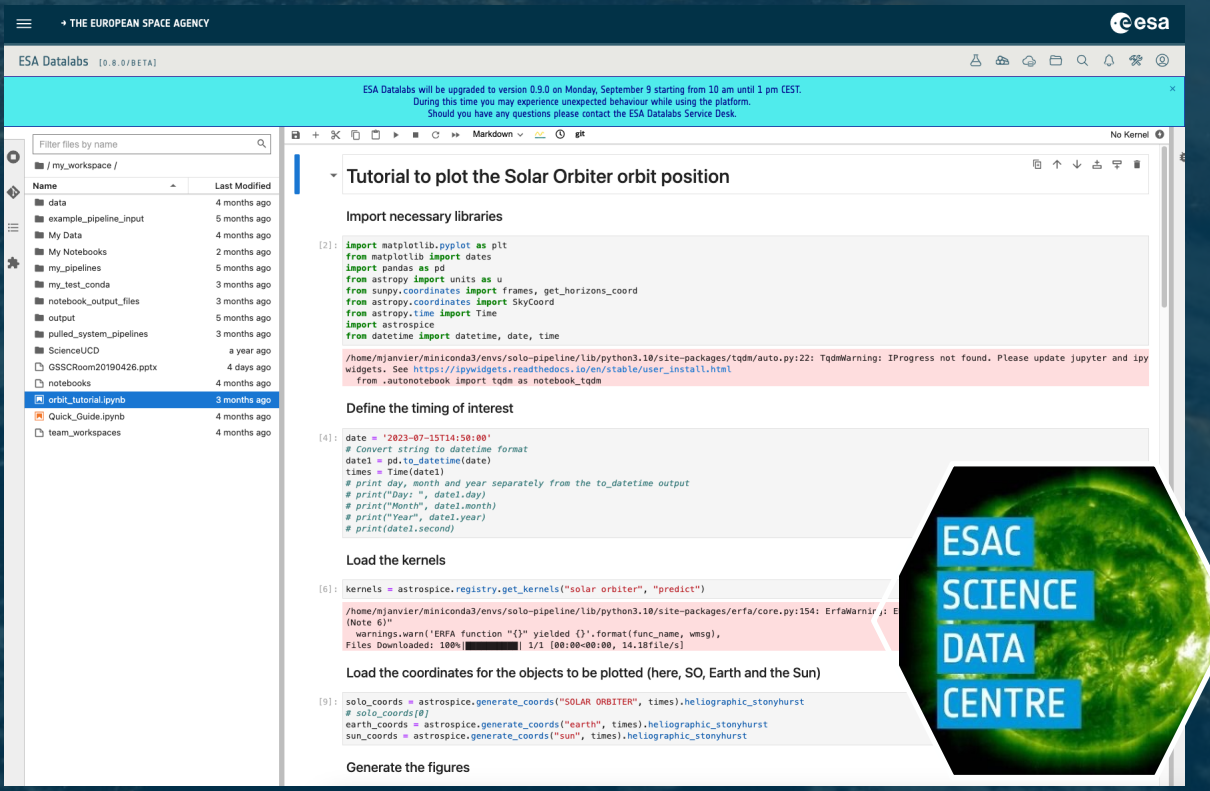
ESASKY

Datalabs for Interactive Analysis

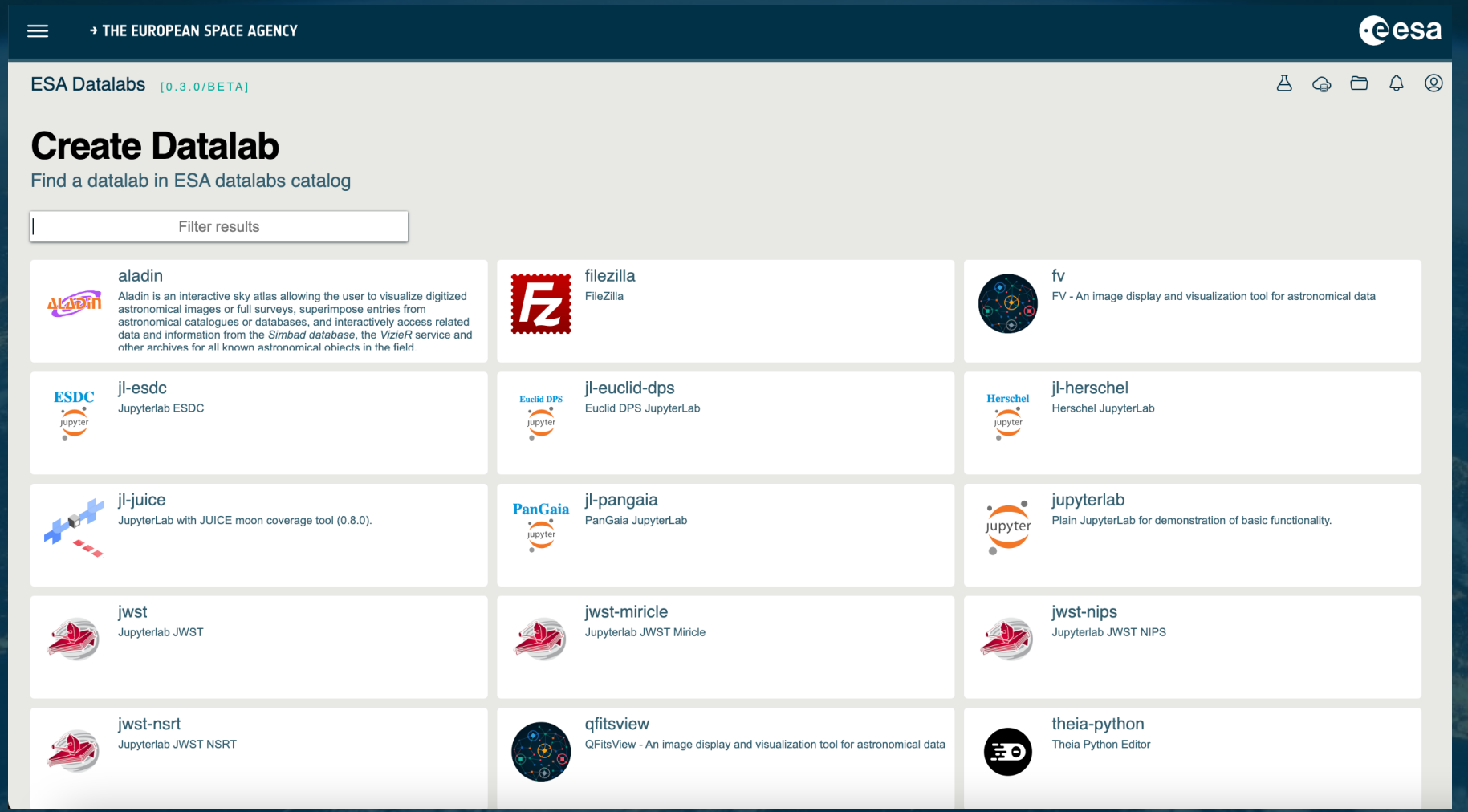


J-HelioViewer

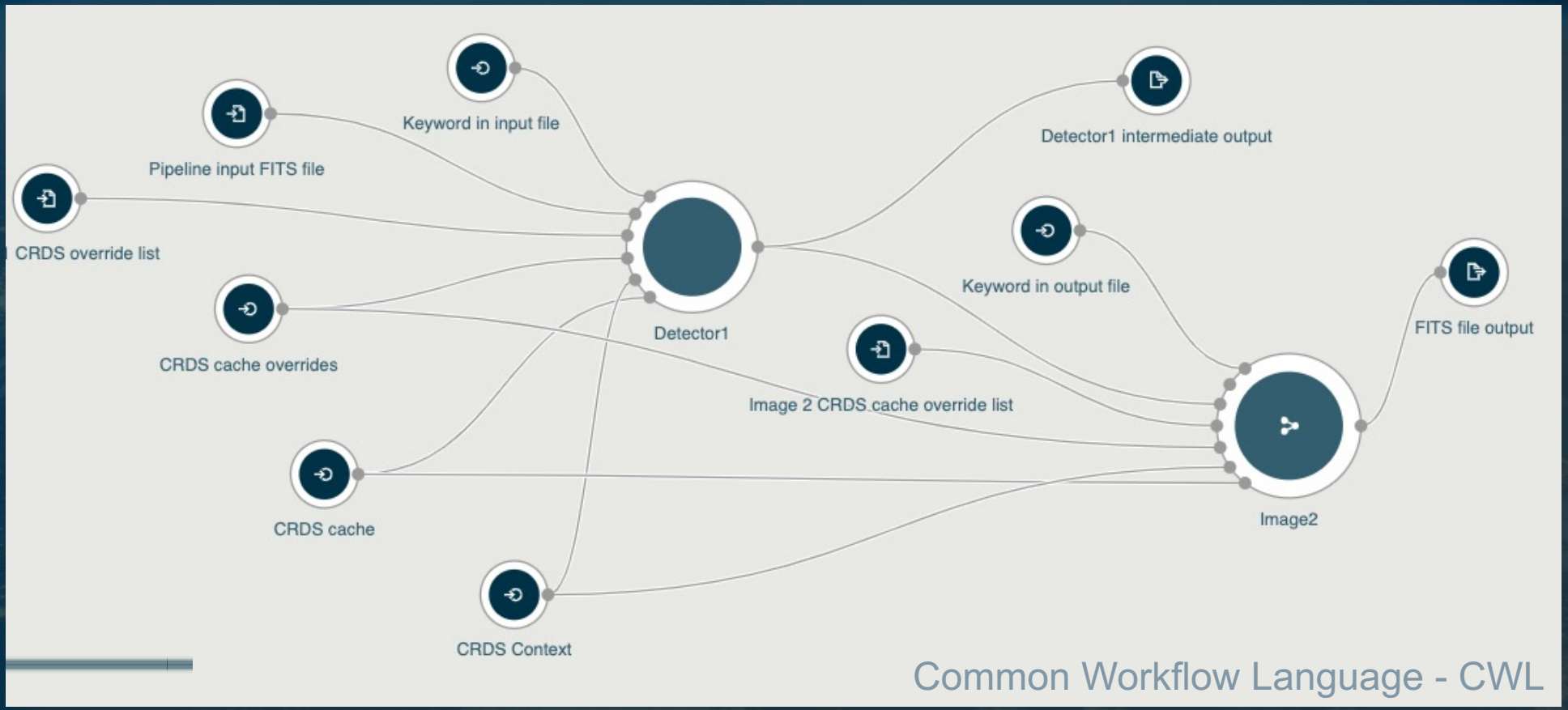
JupyterLab Helio



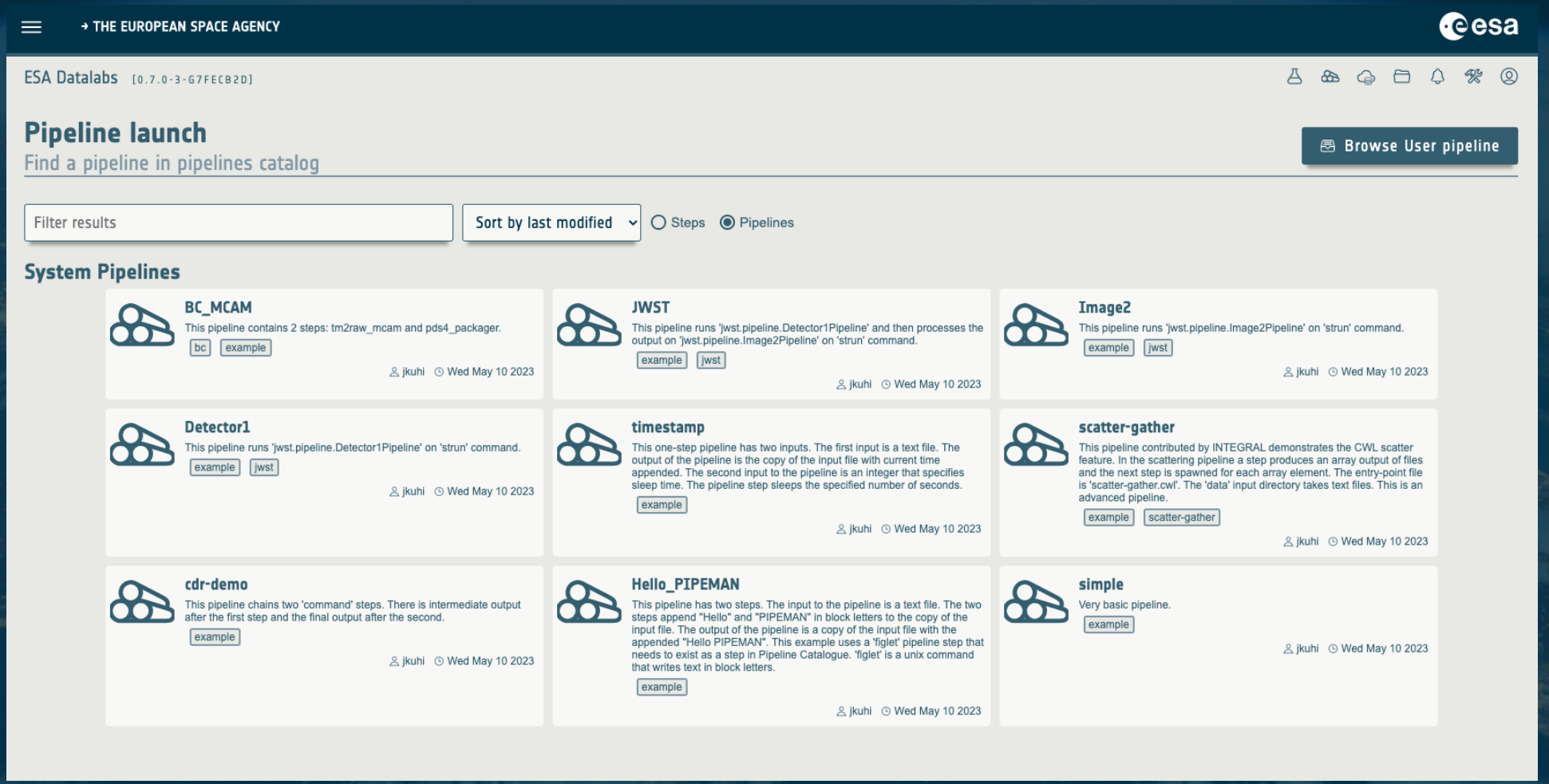
Datalabs Marketplace



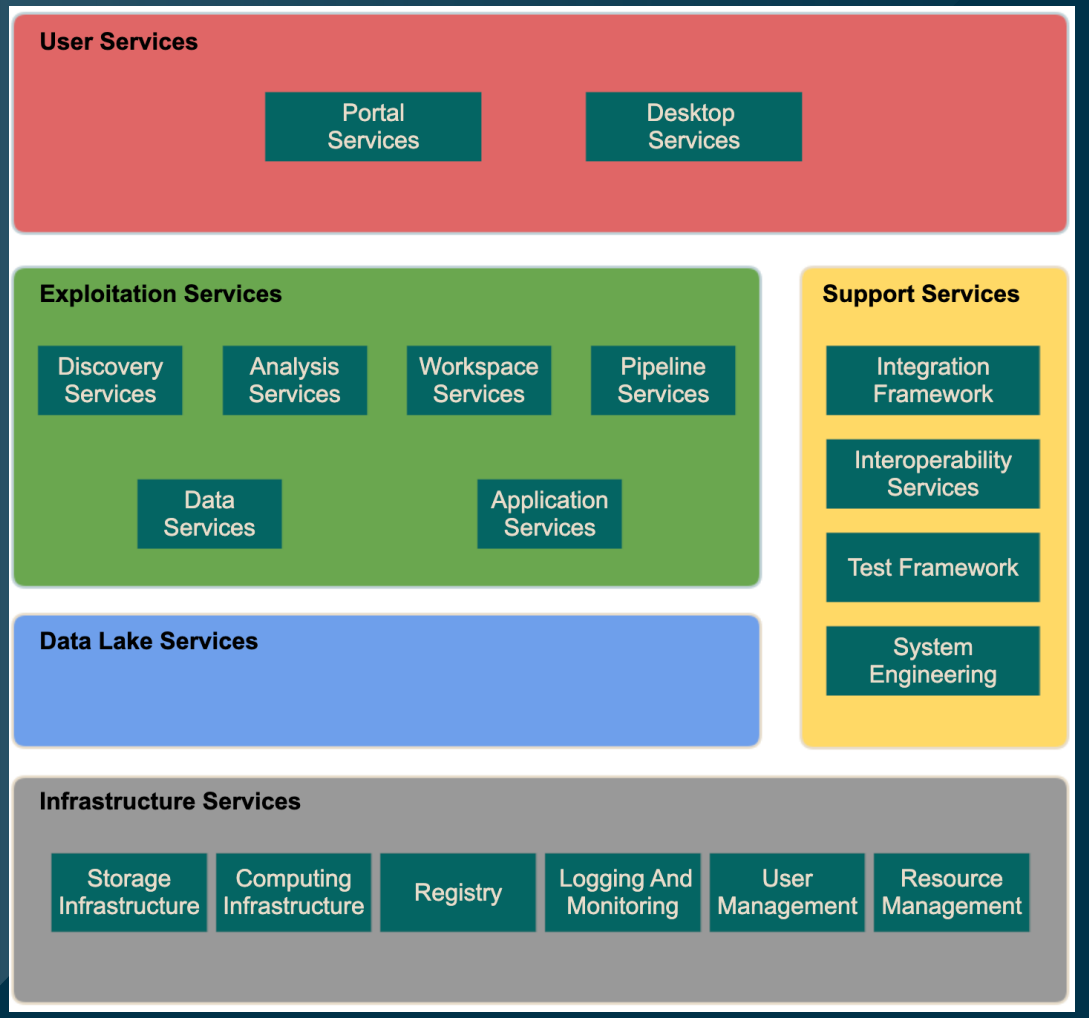
Pipelines for Batch Processing Analysis



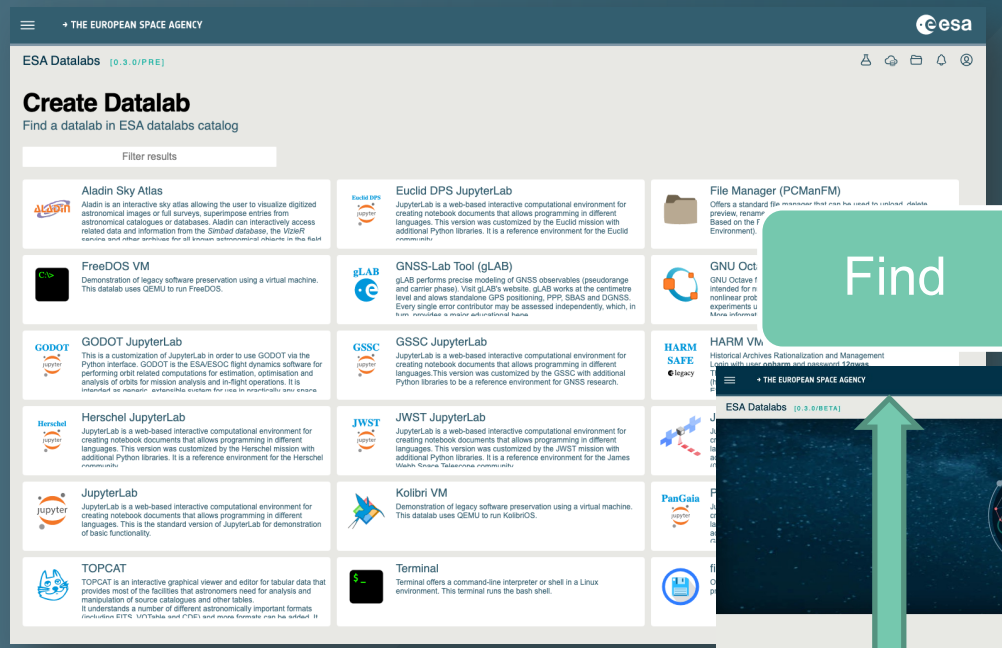
Pipelines Marketplace



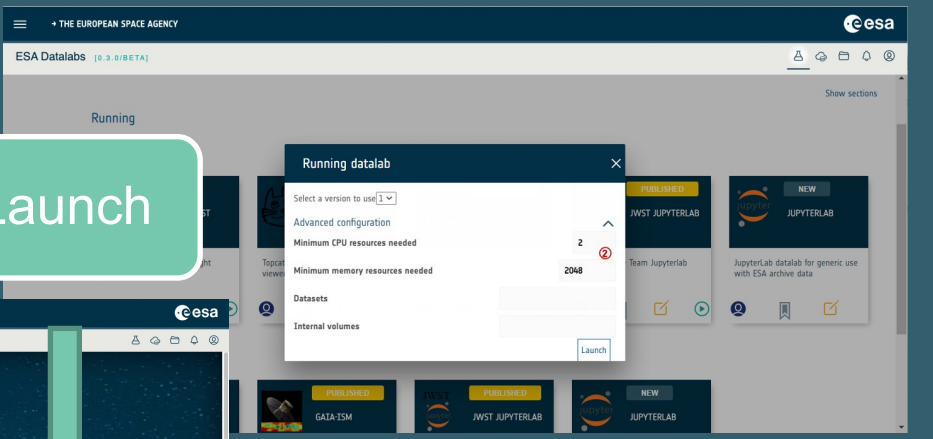
Innovative Architecture – Technology Stack



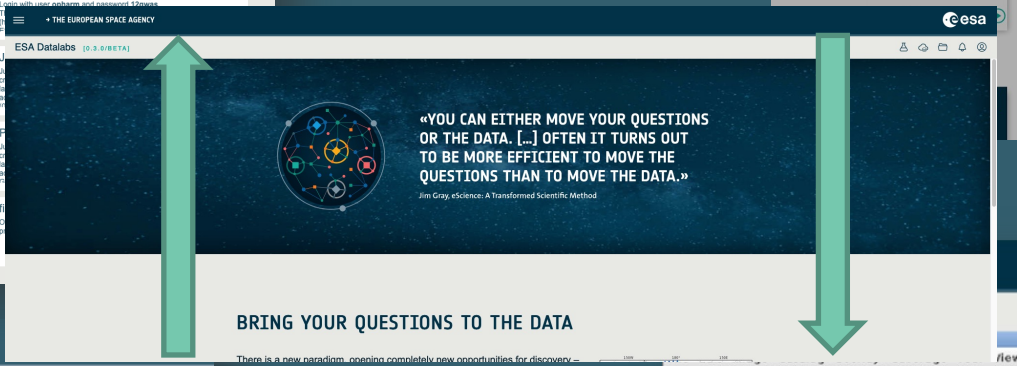
For Problem Domain Science End-Users

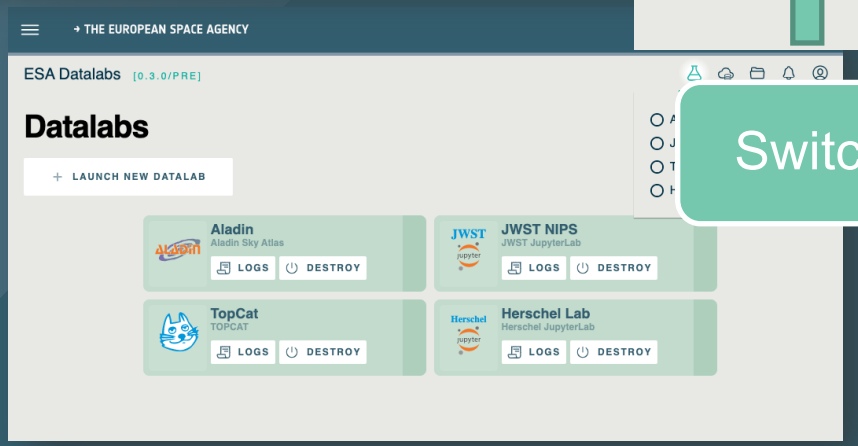


Find



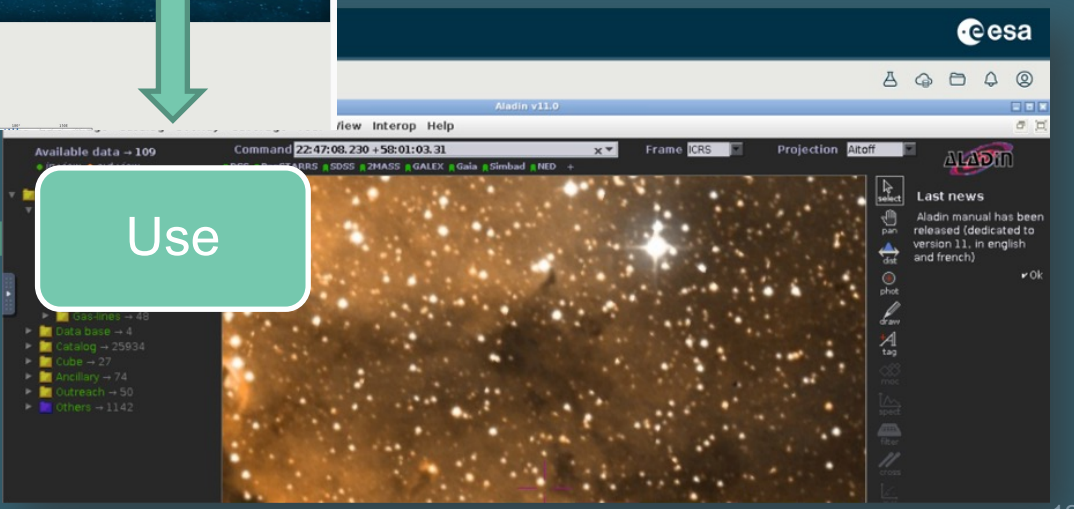
Launch



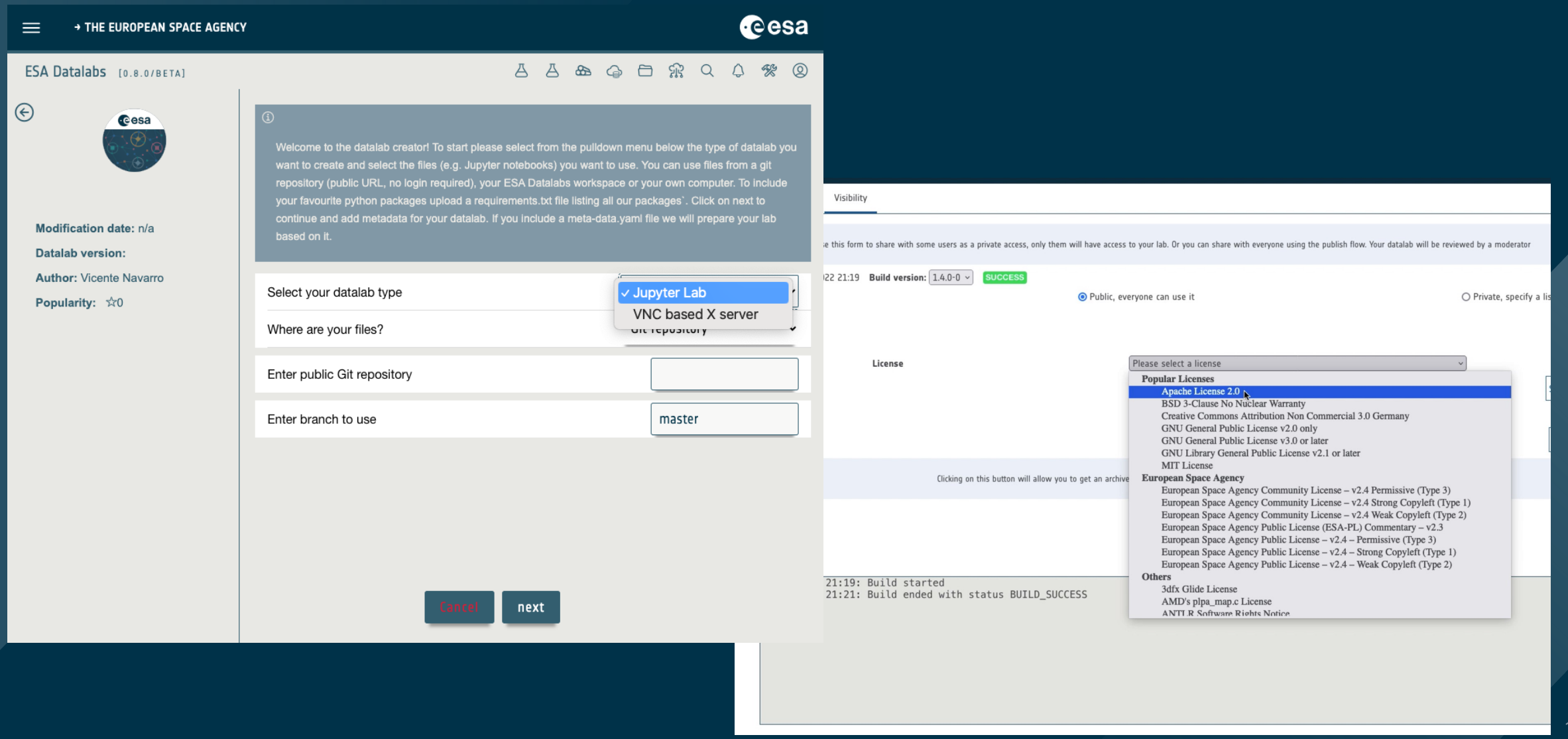


Switch

Use



For Problem Domain Science End Users++



ESA Datalabs Community – Today

768 Registered Users

584 Beta Users

ESA Datalabs – JWST Workshop, Heidelberg 4 - 8 Sept 2023
ESA Datalabs – Euclid Workshop, Copenhagen 21 - 22 Jun 2023
ESA Datalabs Workshop – ESAC 24 - 25 Nov 2022

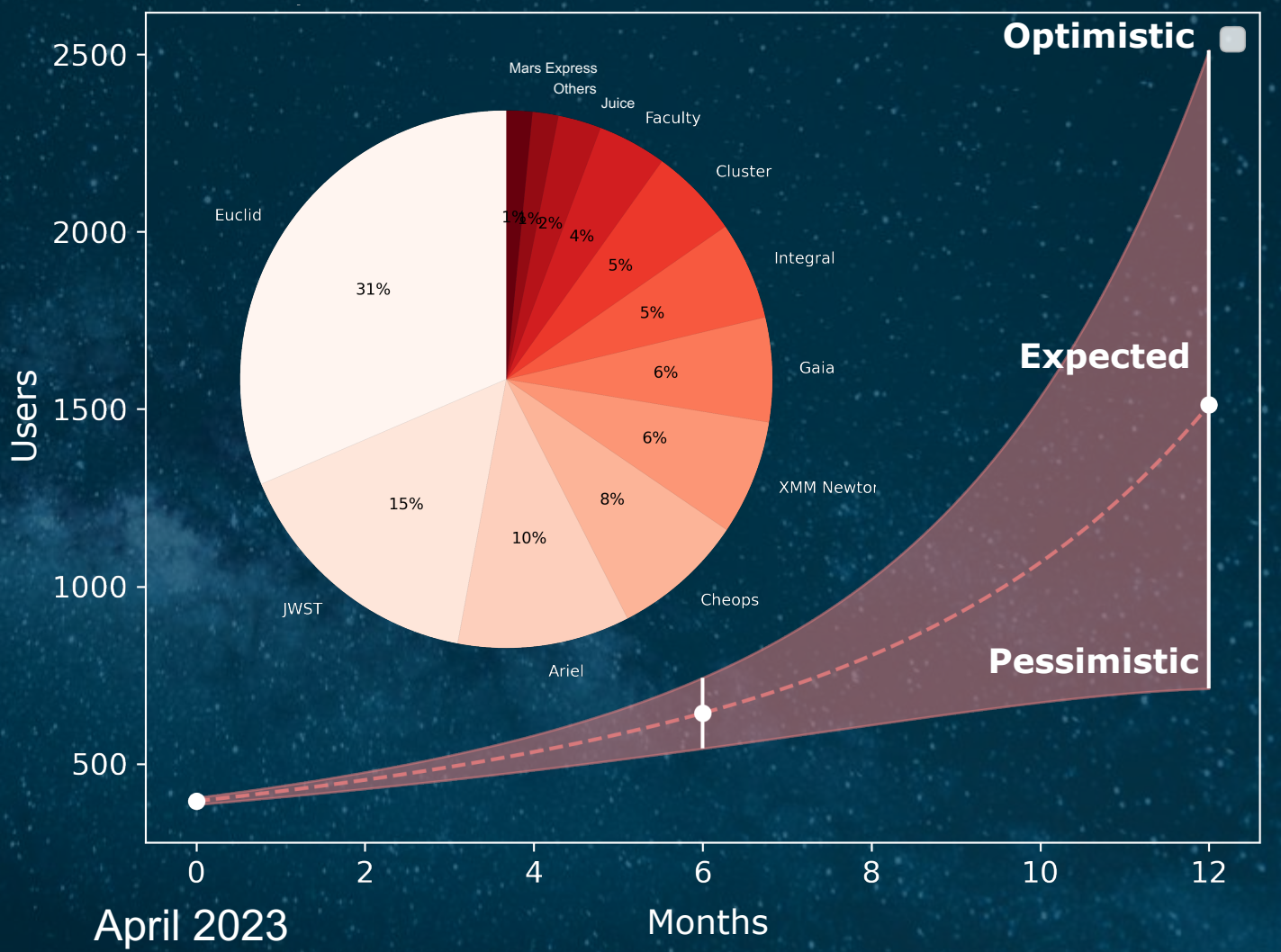
Evolution

ESA Datalabs Community – SCI / ESA

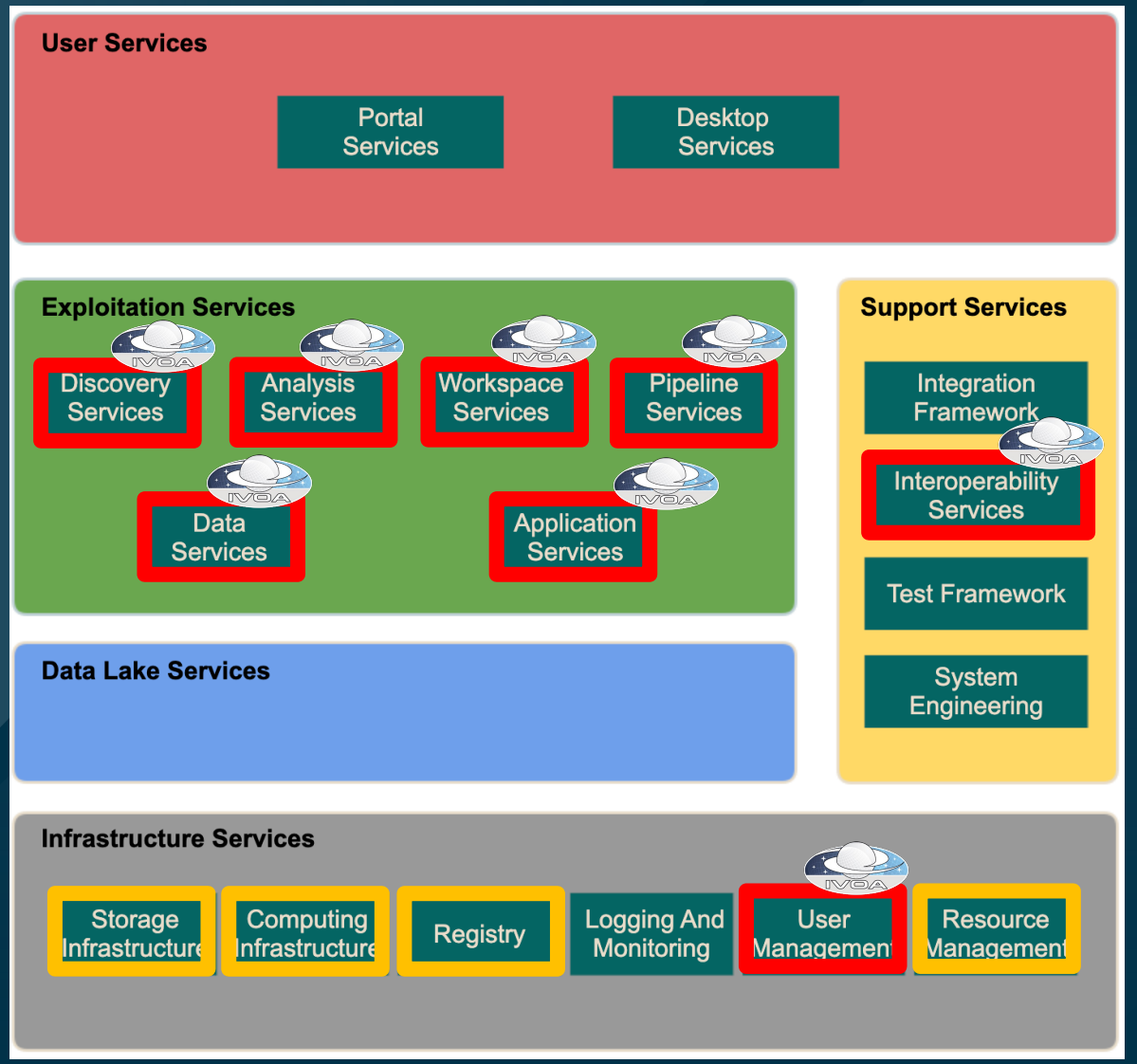
Optimistic: onboarding of all ESA Space Science interested missions and collaboration opportunities

Expected: onboarding of Space Science Euclid and JWST missions as currently planned

Pessimistic: onboarding of existing registration requests



ESA Datalabs Community – SCI

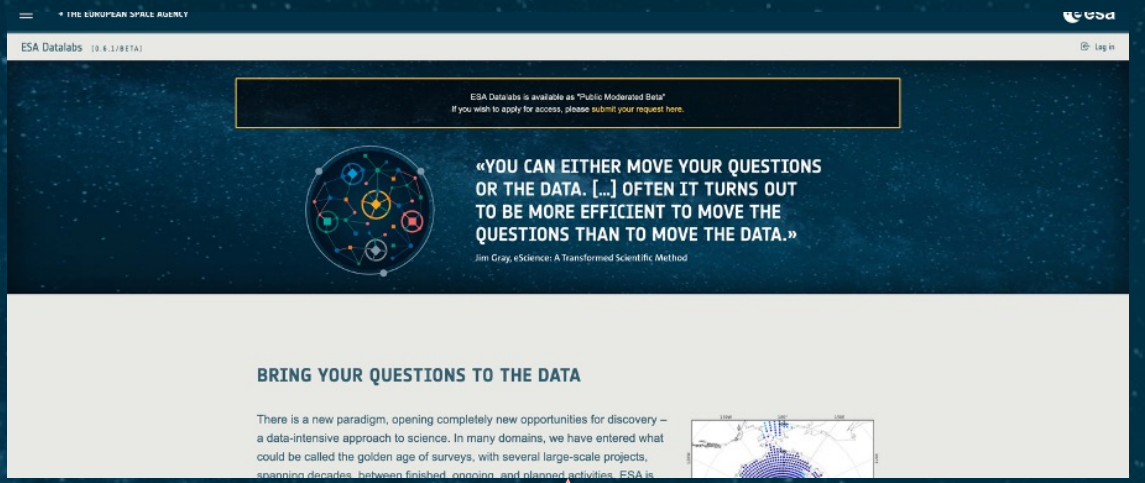


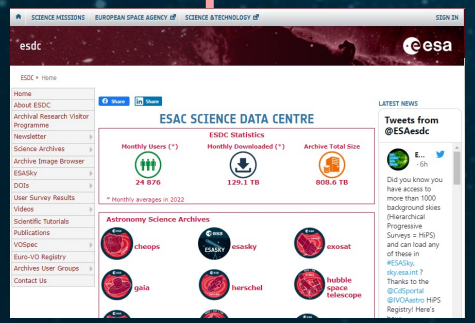
FUNCTIONAL

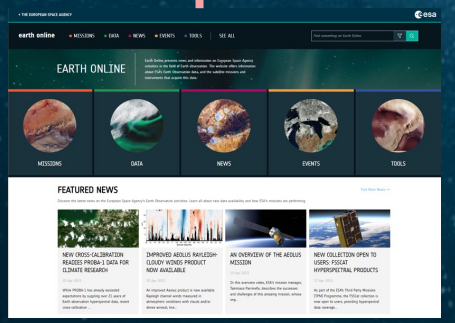
TECHNOLOGICAL

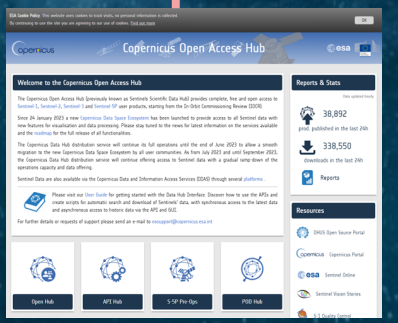
ESA Datalabs Community - ESA

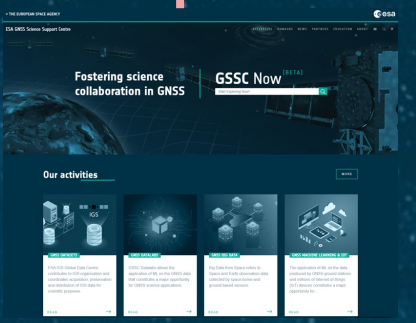
Platforms

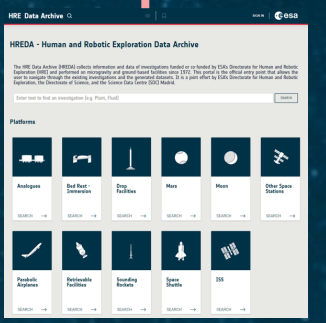








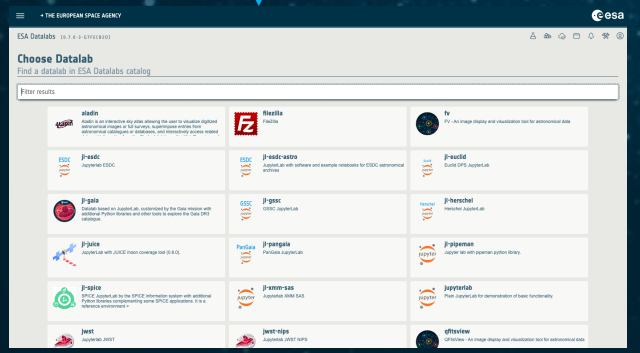




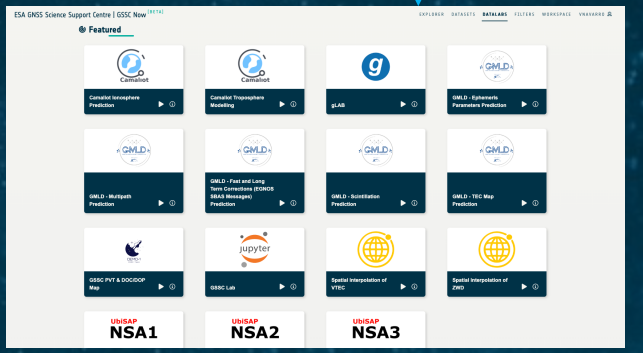
ESA Data Discovery Portal – One Portal To Discover Them All

Platforms

Datasets



SCI, NAV, OPS, EOP …



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gssc.esa.int

Discovery of Exploitation Platforms

Platform and Community Release Roadmap

Q1 2022 Private Beta

Q1 2023 Public Beta Moderated

Q4 2023 Public Beta Unmoderated

Take away messages

The ESA Space Science Exploitation Platform

- SCI Data available for researches to work on it, made easy

Increase Space Science Operations Efficiency

- Reusable for fast implementation of Scientific Processing Pipelines
- Reusable for fast implementation of Scientific Analysis and Visualisation Tools

Enable Collaboration and Open Science

- Share complex processing tools and data with your team (ala JWST)
- Share your contributions with the community in SCI ‘s AppStore

THANK YOU!

Acknowledgements: The diverse skillset required for the development of ESA Datalabs and GSSC Now, requires involvement of different multi-disciplinary groups. Hence, we would like to thank our industrial partners, Edisoft, Uninova, CGI, ACRI-ST, GMV and Ideorum. Thanks also to the Science and Operations Technical IT Unit at ESAC, the ESA Datalabs User's Group, the members of ESA Space Science missions, and the ESAC Science Data Centre.

Find out more in datalabs.esa.int