

**CDS Scientific Council Meeting: Nov 28-29, 2023**

***In-person***

***Observatoire astronomique de Strasbourg - Amphitheatre***

*11 rue de l'Université, Strasbourg*

**Tuesday 28 November**

- 10h - Coffee available for Council members
- 10h30 - Welcome and introductions
- 10h40 - CDS Activity Report 2022-23 (M. Allen)
- 11h10 - CDS Information System (P. Fernique)
- 11h40 - SIMBAD (C. Loup, A. Oberto, S. Lesteven)
- 12h10 - Lunch (Buffet)
- 14h - VizieR (P. Ocvirk, G. Landais)
- 14h30 - Aladin (C. Bot, T. Boch)
- 15h00 - Coffee break
- 16h00 - Demonstration - CDS services (S. Derriere, M. Marchand)
- 17h - Close
- 19h - Dinner (Council members, Restaurant La Victoire)

**Wednesday 29 November**

- 9h - CDS Science Team work (A. Siebert)
- 9h30 - R&D and Training (A. Schaaff)
- 10h - CDS Plans and Challenges (M. Allen)
- 10h30 - Coffee break
- 11h-14h30 - **Closed sessions** (lunch provided for Council members)

**Stephen Serjeant** [Chair] (Open University, UK)

**Eric Peng** (NOIRLab)

**Marica Branchesi** (Gran Sasso Science Institute (GSSI))

**Guido De Marchi** (ESA)

**Michael Sterzik** (ESO)

**Roopesh Ojha** (NASA)

**Olivier La Marle** (CNES)

**Astrid Lamberts** (Observatoire de la Côte d'Azur)

**Thierry Forveille** (IPAG)

**Franck Le Petit** (Observatoire de Paris)

**Chiara Ferrari** (INSU representative)

**Rémi Barillon** (Université de Strasbourg Vice President for Research and Open Science)

Invited: **Pierre-Alain Duc** (Dir. Obs. Strasbourg)

# CDS Activity Report

## 2022-2023

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November 28, 2023

Mark Allen - Director CDS



CENTRE DE DONNÉES  
ASTRONOMIQUES DE STRASBOURG

# CDS mission

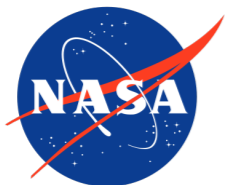
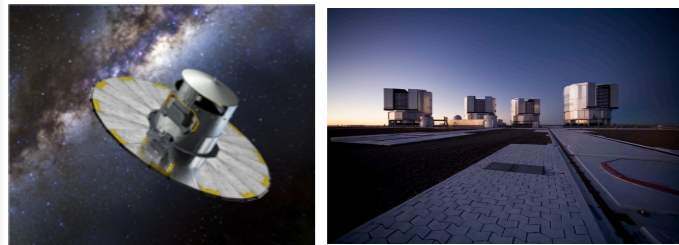
- **Collect useful data on objects in electronic form**
- **Improve them by critical evaluation and combination**
- **Distribute the results to the international community**
- **Conduct research using the data**

## **Science Driven:**

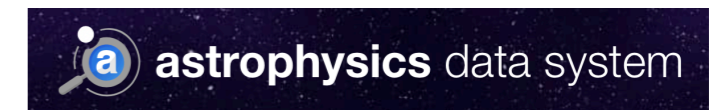
- *Necessary evolutions to meet the scientific reference service needs of the astronomy community*
- *Innovations to meet challenges and ensure sustainability*
  - *Science is changing, technology is changing*

# CDS - a part of the global astronomy data infrastructure

## Connections to the Observatories and Space Agencies



## Collaboration with other Astronomy Data Centres



- Harvard Smithsonian ADS
- NASA Extragalactic Database

## Astrophysics Journals



+ ...

## Building the Data Sharing framework of Astronomy: *The Virtual Observatory*



Certified:



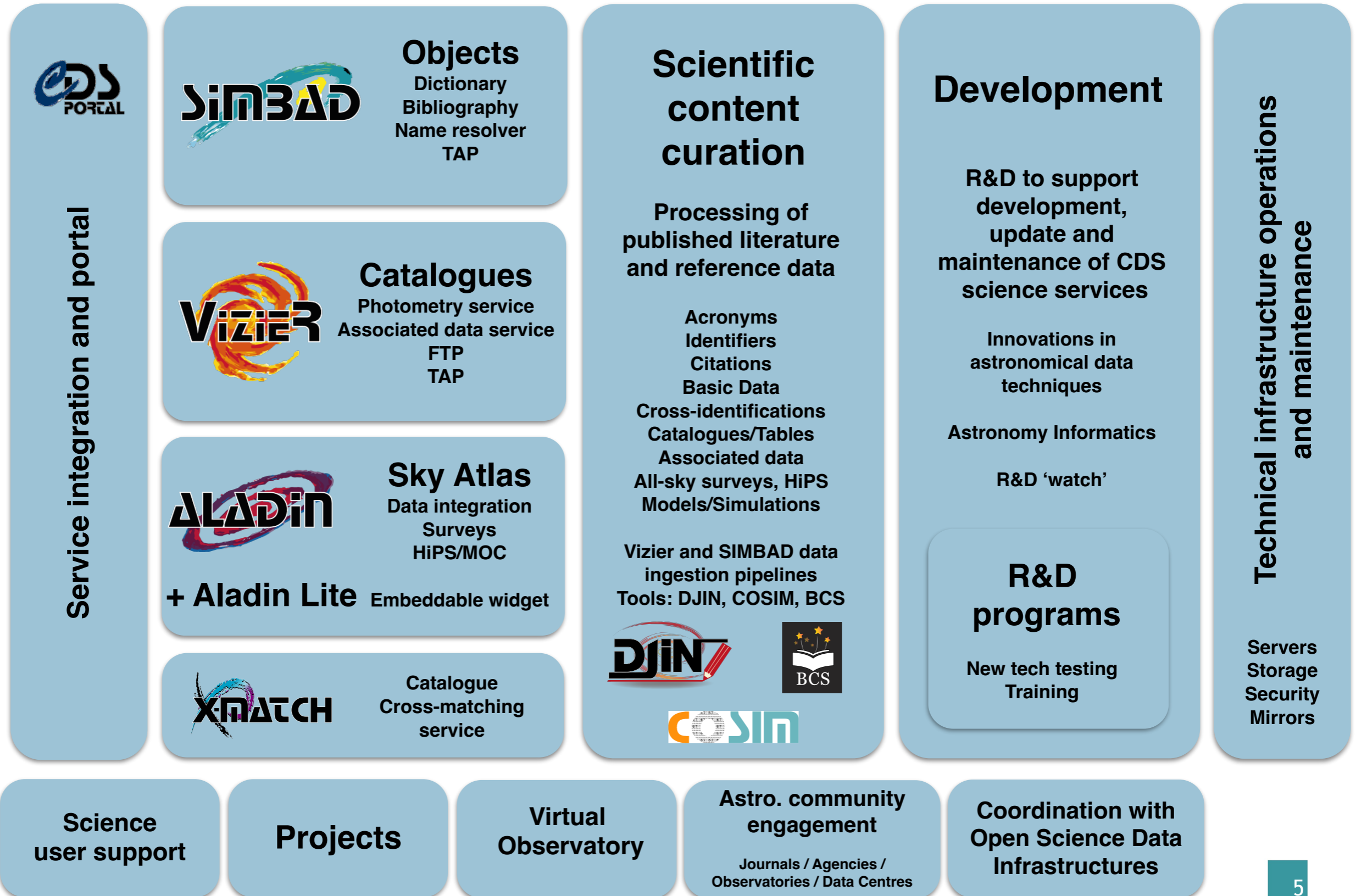
Networks:



recherche.data.gouv.fr



# □ CDS in 2023



# □ 2022-2023

- **A busy year that involved making fast reactions to changes.**
- **Core work of building CDS content, and operating the services, was maintained at a very high level.**
- **Recruitments of 2 permanent CNRS positions: Documentalist and Research Engineer. Transfer-in of CNRS Admin. Assistant.**
- **Changes in contractor staff, some early departures.**
- **Change of physical hosting of CDS servers.**
- **Many changes in CDS services 'in-progress' according to plans.**
- **Management of budget requests and uncertainties.**
- **Big challenge to increase the scientific support of CDS.**



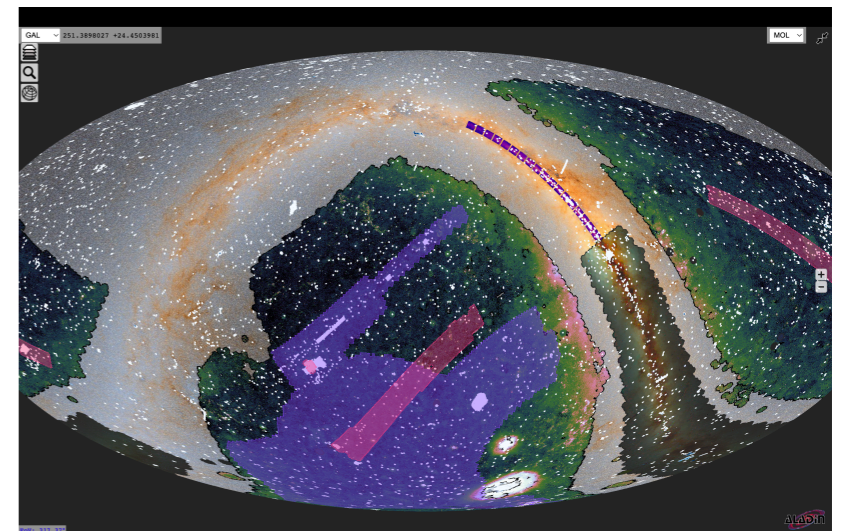
# □ 2022-2023

- **CDS services continue to be heavily used:**
  - **3.0 million queries/day** - see next presentation
- Contributions: IVOA, EOSC, RDA, Recherche Data Gouv
- Projects — **ESCAPE, EuroPlanet, EOSC-Future, XMM2ATHENA, SpaceSci-RI, CDS-ODAS**
- Community interactions - **AAS, ADASS, EAS, SF2A**
  - visit of AAS to CDS in Sept 2023
- Engagements with large projects via : ESCAPE, CDS participation in Gaia, and SKA SRC activities.
- Much time and effort for CDS involvement in Working/Thematic groups at national level.



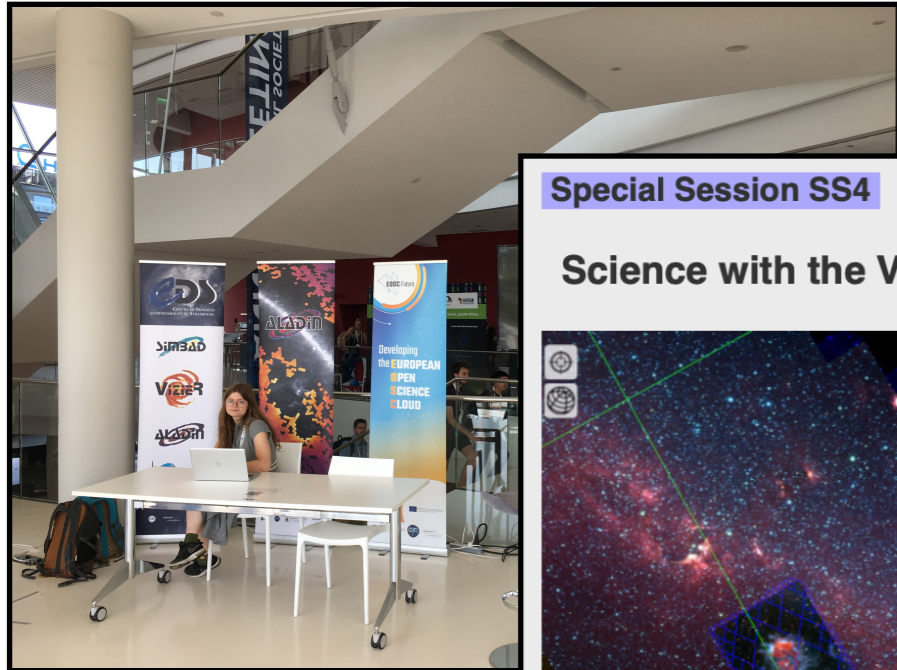
# □ Highlights

- **Open Science in Astronomy workshop, and planetarium display at SF2A 2023.**
  - French National astronomy meeting hosted by ObAS in Strasbourg June 2023.
- **Aladin Lite version 3.**
  - Released January 2023
- **Accelerated growth of the SIMBAD database.**
  - SIMBAD grew by an exceptional 3 million astronomical objects in 2022-23 due to the ingestion of a number of large surveys with spectral classifications.
- **Relocation of the CDS servers in the UNISTRA data centre and IPHC server room.**
  - Final moves in summer 2023.





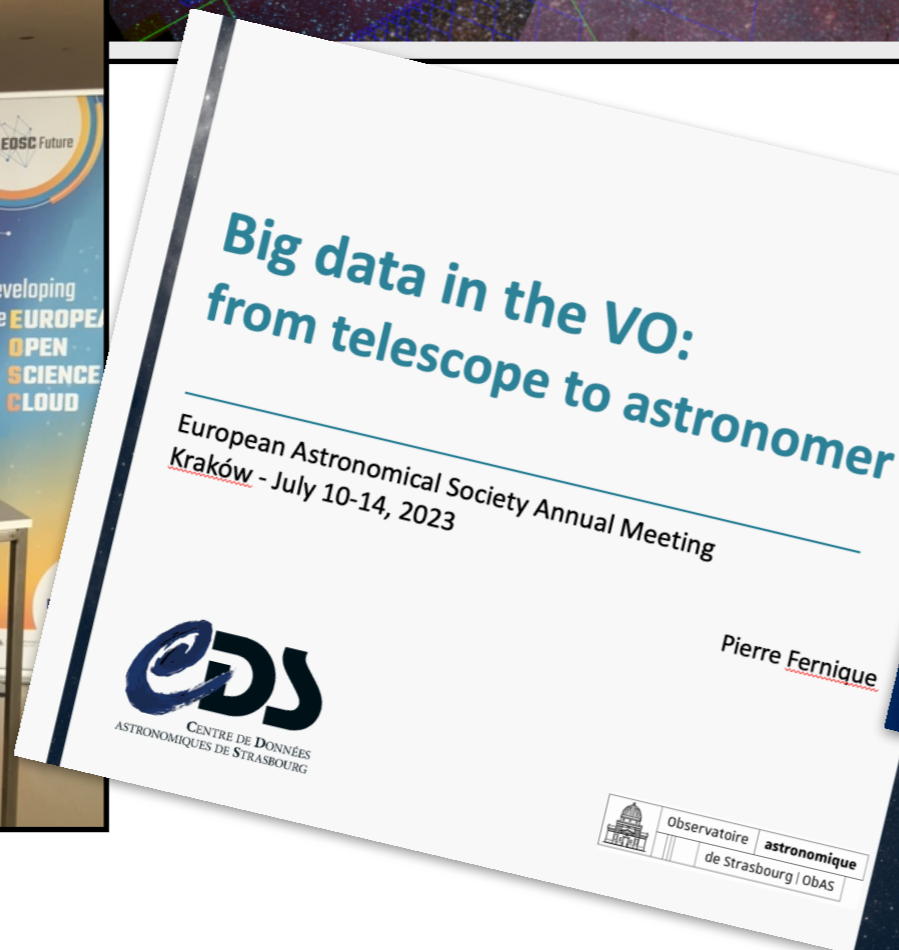
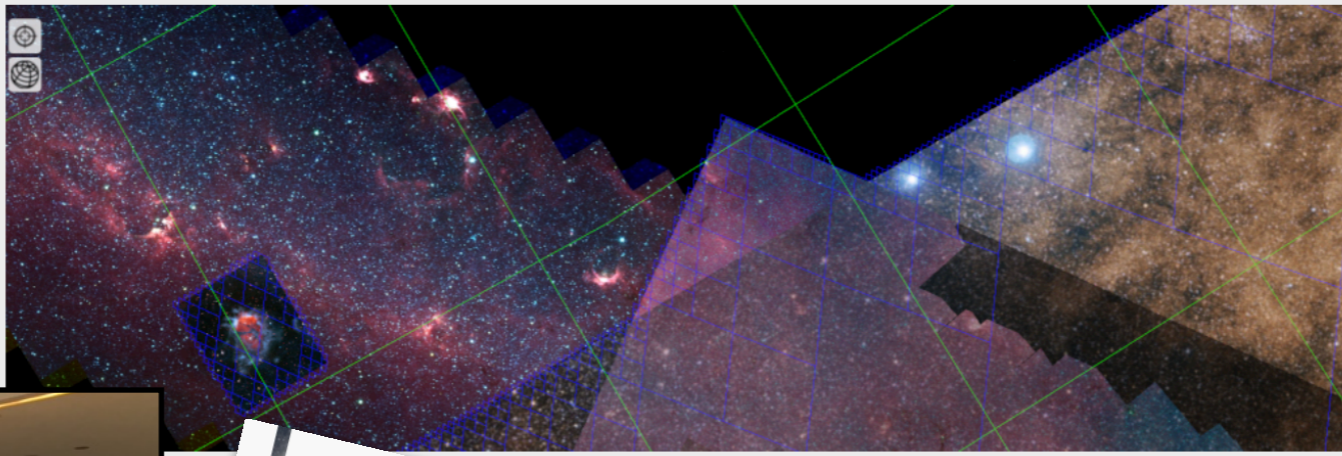
# □ CDS @ EAS Conference



Special Session SS4

12 July 2023

Science with the Virtual Observatory: status, success cases, the future



# Staff



## Direction and Administration

M. Allen (Director)

P. Fernique (Technical Lead), Admin: C. Steyer, C. Halter

### Permanent staff:

- 11 - Researchers  
(8 CNAP, 2 CNRS, 1 Emeritus.)
- 10 - Software engineers
- 11 - Documentalists
- 2 - Admin

### Contract staff:

- 2 - Engineers
- 2 - Documentalists
- 3 - Postdoc researchers

PhD students: 3

### Science

M. Allen  
C. Bot  
L. Cambrésy  
S. Derriere  
F. Genova [*Emeritus*]  
C. Loup  
G. Monari  
A. Nebot  
P. Ocvirk  
A. Siebert  
B. Vollmer

### Software Development and Operations

M. Baumann  
T. Boch  
F. Bonnarel  
P. Fernique  
G. Landais  
S. Lesteven  
G. Mantelet  
A. Oberto  
F-X. Pineau  
A. Schaaff  
*A. Flint*

### Documentalist

A. Eisele  
M. Brouty  
C. Brunet  
M. Buga  
E. Collas  
M. Neuville  
E. Perret  
E. Son  
K. Van Der Woerd  
P. Vannier  
P. Vonflie  
*A. Fiallos*  
*C. Fix*

### Support (shared with Observatoire de Strasbourg)

S. Langenbacher, V. Trimbou, C. Saillard, T. Keller

#### Post-doctoral Researchers

*C. Lui*  
*P. Sharma*

#### Project support

*A. Gonneau*  
*M. Marchand*

#### Ph.D Students

*L. Correia*  
*T. Oliveira*  
*M. Planaque*

#### Software Development Interns

**10** interns, short term contracts  
(Apprenticeship - J. Abid)

# □ Staff - recent changes

## Permanent staff:

- Documentalist - **F. Marquis** - left October 2021 (*25 yrs @ CDS*).
  - CNRS ‘mobility position’ *FSEP* position open in December 2022 - failed
  - CNRS position opened in 2023 - **K. Van der Woerd** recruited.
  - **E. Son**, leaving Nov 2023.
- Research Engineer - Need for new developments and SKA SRC contrib.
  - CNRS position opened in 2023 - **M. Baumann** recruited.
- Administrative assistant - **L. Arbousse** - left April 2021 (*17 yrs @ CDS*).
  - *replaced by temporary contract in Oct 2021, but left Sept. 2022.*
  - CNRS allocated **C. Steyer**, October 2023, expect dep. Dec 2023.



# □ Staff - recent changes

## Contract staff changes:

- Project Engineer (ESCAPE/CDS) : **H. Heintl** - finished May 2023.
- Documentalist - **A. Fiallos** - leaving Nov 2023.
- Engineer (VizieR) - **A. Flint** - leaving Nov 2023.
- Open Science Engineer – **M. Marchand** - continued.
- Open Science Researcher – **A. Gonneau** - started March 2023.
- Postdoc (ESCAPE/CDS) – **S. Amodeo** - left May 2023
- Postdoc XMM2ATHENA/CDS - **P. Sharma** - started May 2023.
- Apprenticeship - **T. Dumortier** - finished Sept 2023.
- Apprenticeship - **J. Abid** - started Sept 2023.

## Up-coming:

- Postdoc (CDS) – **K. Voggel** - to start short contract in January 2024.
- Documentalist (DJIN) – CNRS Contract position advertised.
- Documentalist (VizieR) – UNISTRA Contract position to be advertised.
- Postdoc (CDS-ODAS) – to be advertised 2024.
- Research Engineer(s) (CDS-ODAS/VizieR) – to be advertised 2024.

# □ National and European Landscape

## Elements that define high level policies:

- **French National Roadmap for Research Infrastructures (2021)**
- MESR National Plan for Open Science - 2nd plan released in 2021
  - Recherche Data Gouv inaugurated 2022.
- European Cloud Initiative & European Open Science Cloud (EOSC)
  
- CNRS-INSU Prospective
- INSU Astronomy & Astrophysics Prospective
- CNES - French Space Agency prospective
- ASTRONET Science Vision and Infrastructure Roadmap (published 2023)



# French national roadmap for Research Infrastructures

Roadmap 'launched' March 2022

## **Emphases:**

- Open Science aspects.
- Research data in infrastructures.
- Role of IVOA and CDS contribution.
- Role of CDS for data connected to pubs.
- CDS partnerships CNES, ESA, NASA/SAO/ADS, A&A.

## **CDS entry:**

- Scientific production and service use.
- Open Science.
- International aspects.
- Society aspects - contracts / training / planetaria

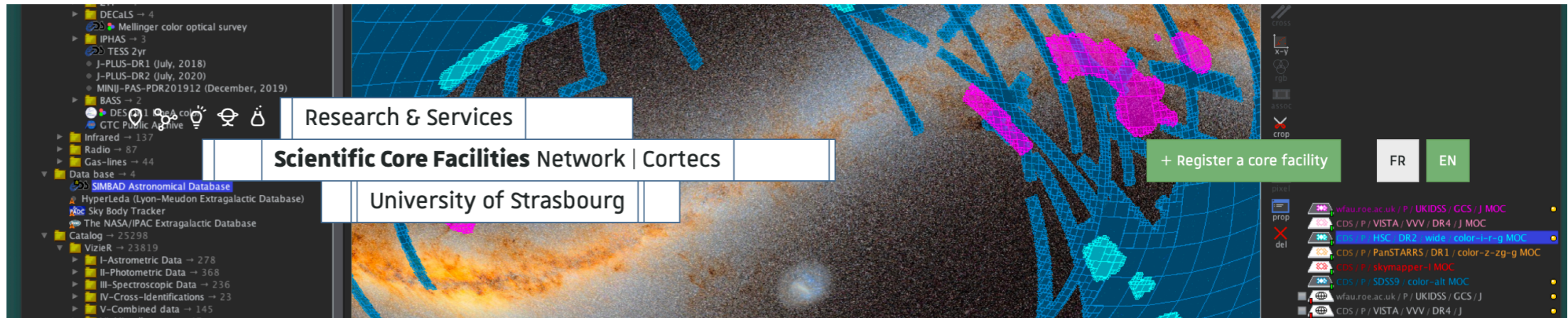
## **Research Infrastructure Status**

- Important for CDS support. (*e.g. FNSO grant category for Research Infrastructures*)





# CORTECS network



Centre de Données astronomiques de Strasbourg

Domain Earth and space sciences

## The core facility



CENTRE DE DONNÉES ASTRONOMIQUES DE STRASBOURG

- Head Manager of the core facility  
**Allen ALLEN**
- Scientific Manager  
**Mark ALLEN**
- Technical Manager  
**Pierre FERNIQUE**
- UMR 7550 - ObAS / Strasbourg Astronomical Observatory
- CNRS, UNIVERSITY OF STRASBOURG
- [Contact the core facility](#)  
**+33 3 68 85 24 10**
- [Website of the core facility](#)
- Central campus : Historical
- Established in an unic site
- Collaborations of research**
  - with the academic community
  - to the socio-economic world



## Certifications and accreditations





# CORTECS network

Research & Services

Scientific Core Facilities Network | Cortecs

University of Strasbourg

+ Register a core facility

FR EN

CDS Centre de Données astronomiques de Strasbourg

Domain Earth and space sciences

- Network of **‘Scientific Core Facilities’** at University of Strasbourg
- Labellisation renewed in 2023
- Brings visibility and resources



Certifications and accreditations



CENTRE DE DONNÉES ASTRONOMIQUES DE STRASBOURG

- 📍 Central campus : Historical
- 📄 Established in an unic site
- 🤝 **Collaborations of research**
  - ✓ with the academic community
  - ✓ to the socio-economic world



# ☐ Recherche Data Gouv - inaugurated July 2022

## New French initiative in the National Plan for Open Science

### — *CDS is named as one of the Thematic Reference Centres*

- Define the international data description standards in their thematic field;
- Define and disseminate best practices for data collection, documentation, processing and dissemination in their thematic field;
- Support inclusion in and compliance with the international ecosystem.
- Repositories are to be 'harvested' by *Recherche Data Gouv*;



### CDS participation:

- Technical meetings about the repository in development.
- Seminar meeting (June 2023)
- Thematic Ref. Centres meeting (tomorrow)
- Springtime of data (UNISTRA)
- Answering requests



# □ Virtual Observatory

**CDS participation in VO at National, European and International levels:**



**CDS continues leading role in IVOA**

**Executive board, WG/IG roles:**

- **Executive Board member for EuroVO** - M. Allen
- **Chair of the Committee for Science Priorities** - A. Nebot
- **Deputy Chair of the Data Access Layer Working Group** - G. Mantelet
- **Chair of the Data Curation and Preservation Interest Group** - G. Landais
- **Chair of the Radio Astronomy Interest Group** - F. Bonnarel
- **Deputy Chair of the Time Domain Interest Group** - P. Fernique
- **Chair of the Education Interest Group** - H. Heintl (*@CDS until May 2023*)
- **Editorial team for the IVOA Newsletter** - S. Amodeo (*until May 2023*)

**Important progress for the interoperability of astronomy data and services**

- e.g. Space-Time coverage of data (MOC 2.0 standard) and HiPS system.
- Leadership for integration of Radio Astronomy (+others) into VO framework

# □ CDS in SKA SRC prototyping

Prototyping access from visualisation tools to  
□ SKA science images and cubes stored in a  
rucio DataLake through IVOA discovery and  
access services

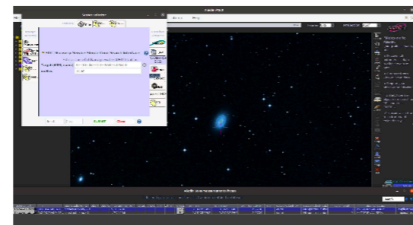
**SRC | Net**  
SKAO Regional Centre Network

F.Bonnarel, J.Salgado, M.Allen, R.Barnsley, M.Baumann, T.Boch, C.Bot, R.Butora, J.Collinson,  
P.Fernique, V.Galluzzi, R.Joshi, A.Lorenzani, M.Molinaro, M.Parra-Royon, J.Sanchez-Castaneda,  
S.Sanchez-Exposito, E.Sciaccia, G.Tudisco, F.Vitello, A.Zanichelli

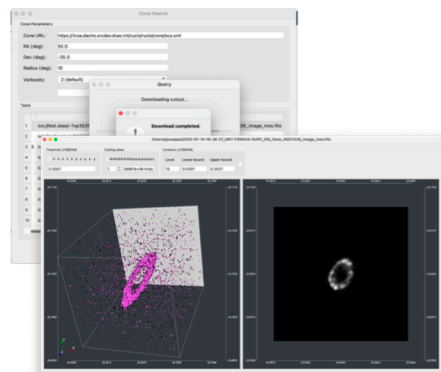
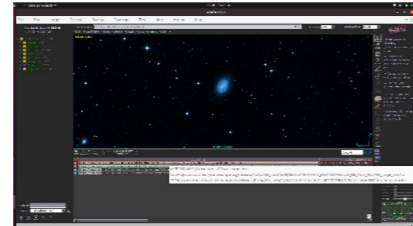
Contact :  
francois.bonnarel@astro.unistra.fr

## Discovering and accessing datasets from visualisation tools through IVOA standards:

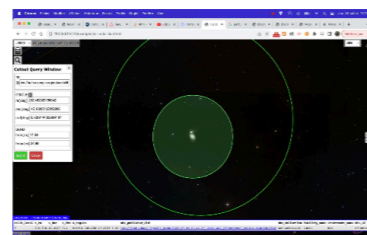
- VisIVO, Aladin Desktop and Aladin Lite have been customized to access the rucio data discovery service delivering ObsCore metadata through an IVOA SCS interface.
- From that response, the three tools are able to load the DataLink response in order to discover full retrieval and dataset cutout accesses.
- Each tool is interfacing with the IVOA SODA cutout service to extract datasets of interest. The SODA service is directly accessing datasets by their rucio physical file names.



Aladin Desktop accessing the discovery service, displaying the ObsCore description of datasets (above) and the DataLink links (below)



VisIVO SCS interface and ObsCore response in the background and visualisation of a spectral cube in the front



Aladin Lite interface to the SODA service. Large circle encloses the Field of view of the whole dataset. Small circle encloses the requested cutout area

- ~0.5 FTE contributing to Orange team of SRC prototyping.
- Coordinating French effort in this team.
- Developments in Aladin and Aladin Lite toward SRC goals.
- In-line with CDS interests for
  - Advancing visualisation of cubes, and deploying on remote systems
  - Proposing HiPS nodes at SRCs



VO standards consistent services:  
ObsCore, SCS, DataLink, SODA



VisIVO Aladin Desktop,  
and Aladin Lite are the  
visualisation tools used  
to discover and access  
test SKA data stored in  
the rucio package



# □ National Level Projects

## CDS approach to projects:

- *'Prepare the future'*.
- Lead, and be part of, collaborative initiatives.
- Make the most of new opportunities.

## National level projects:

- Annual application to ASOV to support CDS activities in the Virtual Observatory initiatives.
- Annual applications to CNES APR to support CDS services for space mission related reference services.
- **New opportunities taken in 2023:**
  - National Fund for Open Science (FNSO). Results announced 25 November.
    - **CDS-ODAS (Open Data in Astronomy) approved!! (290 k€)**
    - → Postdoctoral researcher + Research Engineer for 2 years.
    - Major renewal of Vizier Associated Data service.
  - MESR GT-ISD request for projects:
    - Proposed a project for a 'Travelling Data Steward' gathering information about best practices across different data infrastructures... **in progress**

# □ European Projects

- **ESCAPE** - Concluded in Jan 2023, final reports done by March 2023.
- **Europlanet 2024** Research Infrastructure (EPN-2024-RI)
  - Small but important CDS participation (~20PM).
- **XMM2ATHENA** (2021-2024)
  - A. Nebot is the ObAS coordinator. Postdoc recruited.
  - ~5PM participation of CDS related to X-Matching
- **EOSC Future** - Project of science and e-Infrastructures (40 M€, 165 k€ CDS)
  - Started April 2021, CDS participation finished Sept 2023.
  - CDS results for publishing Astronomy data in EOSC. Enabled the CDS *Open Science Engineer* and *Open Science Researcher* (contract positions)

# Astronomy involvement in European Open Science Cloud (EOSC) 'Science Cluster' projects

**ESCAPE** (European Science Cluster of Astronomy & Particle physics ESFRI research infrastructure);

- Virtual Observatory WP

**EOSC Future**

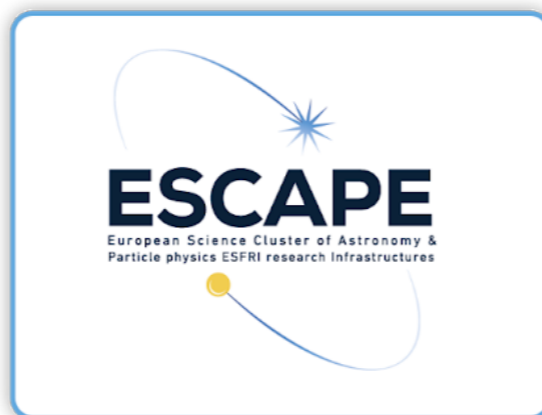


- Combining Science Clusters and e-Infrastructures for 1<sup>st</sup> implementation of EOSC.
- CDS contributing to training materials



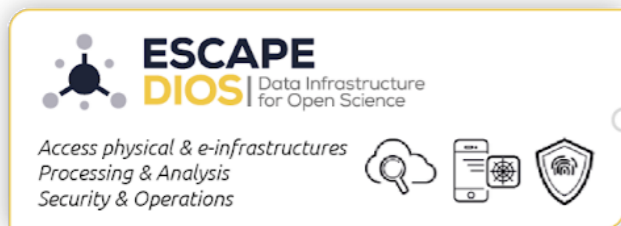
## Data Lake:

Build a scalable, federated, data infrastructure as the basis of open science for the ESFRI projects within ESCAPE.



## Software Repository:

Repository of "scientific software" as a major component of the "data" to be curated in EOSC.



## Virtual Observatory:

## Science Platforms:

Flexible science platforms to enable the open data analysis tailored by and for each facility as well as a global one for transversal workflows.

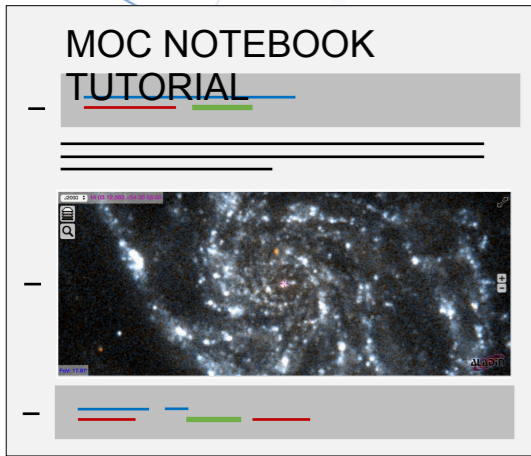
## Citizen Science:

Open gateway for citizen science on ESCAPE data archives and ESFRI community

**Interoperability Standards**  
**Metadata / Protocols**  
**International context**



# Open Science example : *RI requirements* → *Re-usable notebooks*



**6. Training notebook tutorials on-boarded to ESCAPE-OSSR**

**7. Deployed in ESCAPE platform and Virtual Research Environment**

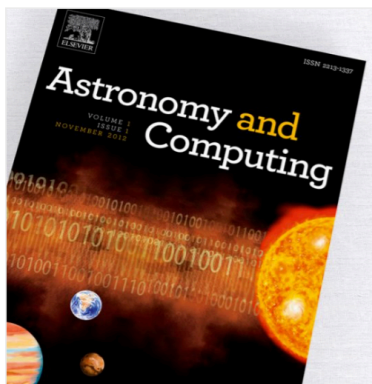
ESCAPE Science Platform prototype

- JIVE Binder
- MyBinder
- 

**5. ESCAPE school on interoperable data + follow on events**



**4. Publication in *Astronomy & Computing* journal**



**3. Reference implementation in open source software onboarded to ESCAPE-OSSR**



**Ready for integration in EOSC systems**

**1. ESFRI/RI requirements for interoperable services and data**



**2. Definition of international open standards**

MOC: Multi-Order Coverage map  
Version 2.0

IVOA Recommendation 27 July 2022

Interest/Working Group:

<http://www.ivoa.net/twiki/bin/view/IVOA/IvoaApplications>

Author(s):

Pierre Fernique (CDS), Ada Nebot (CDS), Daniel Durand (CADC), Matthieu Baumann (CDS), Thomas Boch (CDS), Giuseppe Greco (EGO-Virgo), Tom Donaldson (STScI/NASA), Francois-Xavier Pineau (CDS), Mark Taylor (University of Bristol), Wil O'Mullane (Vera C. Rubin Observatory), Martin Reinecke (Max Planck), Sébastien Derrière (CDS)

Editor(s):

Pierre Fernique, Ada Nebot, Daniel Durand





# eosc EOSC vision in a nutshell

## What

**EOSC is the European web of FAIR data and related services for research**

Research data that is easy to find, access, interoperate and reuse (FAIR)  
Trusted and sustainable research outputs are available within and across scientific disciplines

## Why

**Unlock the full potential of research data to accelerate discoveries and innovation**

## How

- Ensure that Open Science practices and skills are rewarded and taught, becoming the 'new normal'
- Enable the definition of standards, and the development of tools and services, to allow researchers to find, access, reuse and combine results
- Establish a sustainable and federated infrastructure enabling open sharing of scientific results

Strategic  
Research and  
Innovation  
agenda (SRIA)  
[eosc.eu/sria-mar](https://eosc.eu/sria-mar)



# eosc Core funding for the EOSC development (2018-2027)

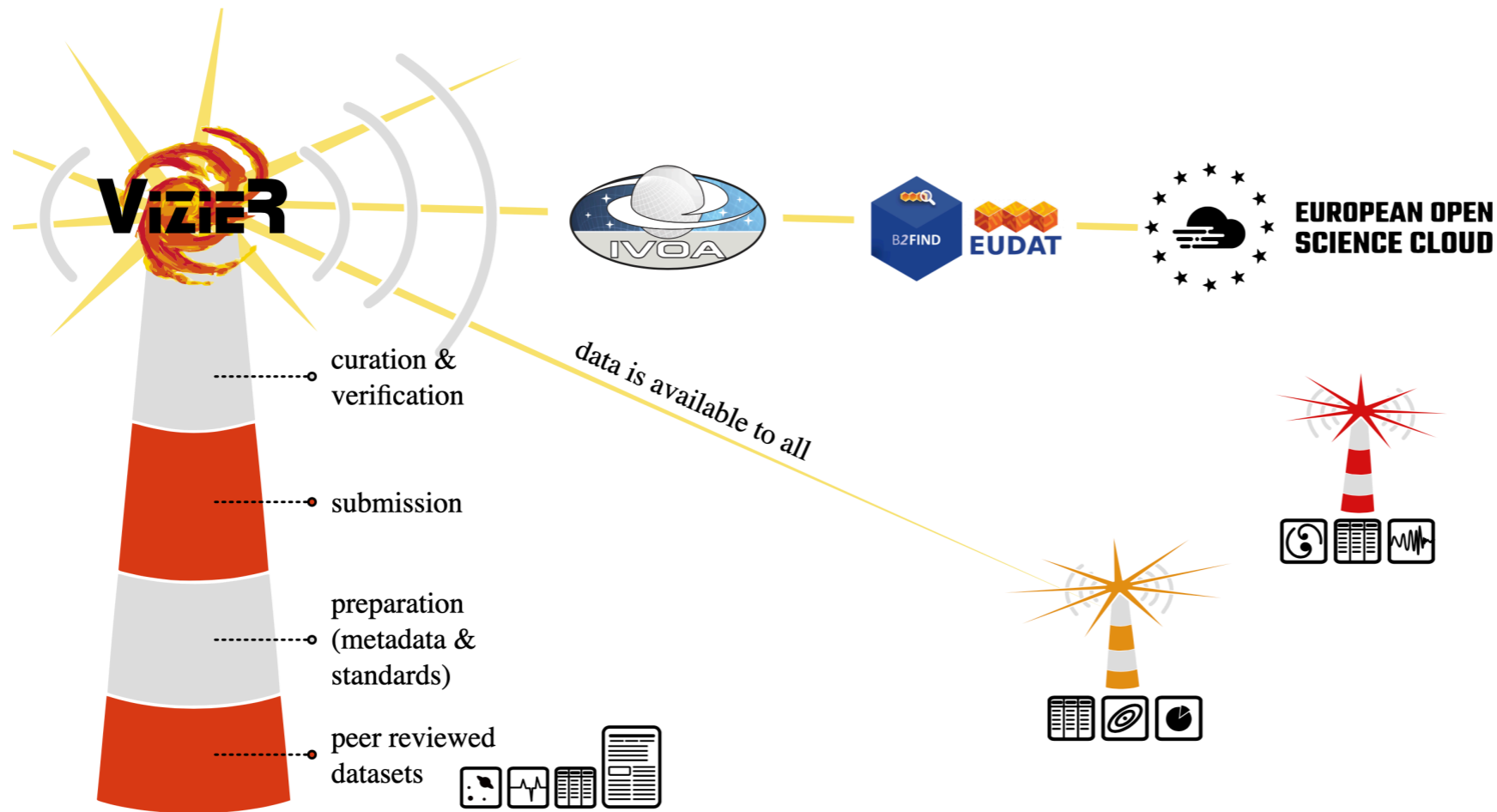
EOSC phase 1: preparatory 2018 - 2020	EOSC phase 2: convergence 2021 - 2027	EOSC phase 3: <u>operation</u> Post-2027
<b>Funding instruments:</b> H2020 calls/grants approach	<b>Funding instruments:</b> HE INFRAEOSC calls / grants approach EOSC Procurement In kind contributions from the EOSC Association members	<b>Funding instruments:</b> Under discussion
<b>Funders:</b> European Commission (DG CNECT; DG RTD)	<b>Funders:</b> European Commission (DG CNECT; DG RTD) Members of the EOSC A, countries part of the EOSC SB & other in kind contributions	<b>Funders:</b> Under discussion
<b>Total funding:</b> 350 M€	<b>Total funding:</b> 1 billion € (500M€ from the EC + 500M€ as in kind contributions from the EOSC Association members) + other in kind contributions	<b>Total funding:</b> Under discussion
<b>Main purpose:</b> To support the implementation strategy defined in the <b>EOSC roadmap 2018-2020</b> by the European Commission	<b>Main purpose:</b> To support the implementation of the <b>strategic priorities identified in the Multi Annual Roadmap 2021-2022; 2023-2024; 2025; 2026-2027 of the Strategic Research and Innovation Agenda (SRIA)</b>	<b>Main purpose:</b> To support the <b>EOSC strategy and governance post 2027</b>





# Creation of EOSC training materials - adapted for Astronomy community

Publish a Journal paper



# ...makes astronomy VO resources available in the EOSC Portal :

The screenshot displays the EOSC Marketplace Resources interface. At the top, the European Open Science Cloud logo is visible. Below it, the heading "Browse EOSC Marketplace Resources" is centered. A search bar contains the text "Gaia" and includes a "Clear x" button, a dropdown menu set to "All catalogs", and a search icon. A horizontal navigation bar below the search bar features ten categories: ALL CATALOGS (underlined), PUBLICATIONS, DATA, SOFTWARE, SERVICES, DATA SOURCES, TRAININGS, INTEROPERABILITY GUIDELINES (marked [BETA]), BUNDLES (marked [BETA]), and OTHER. On the left side, a "Filters" section is titled "Research step" and lists several options with checkboxes and counts: Discover Research Outputs (2343), Process and Analyse (0), Manage Research Data (0), Access Training Material (0), Access Computing and Storage Resources (0), Access Research Infrastructures (0), Publish Research Outputs (0), and Find Bundles (0). The main content area shows "2343 search results All catalogs" and a "Sort By" dropdown set to "Default". The first search result is for "Gaia EDR3", categorized as a "Dataset". It includes the date "01 January 2020", the type "dataset", the author "Collaboration Gaia", and the DOI "10.26093/cds/vizieer.1350". A list of related keywords follows, such as "Asteroids", "Astrometry", "Astronomical object identification", "Optical astronomy", "Photographic photometry", "Photometry", "Proper motions", "Radial velocity", "Standard stars", "Surveys", "Trigonometric parallax", "Variable stars", "exoplanet astronomy", "galactic and extragalactic astronomy", "observational astronomy", "solar system astronomy", "stellar astronomy", "Astrophysics and Astronomy", "Natural Sciences", and "Physics".

...but this is just the beginning for EOSC.

# □ HCERES evaluation and recommendations

## **General Appreciation for CDS scientific team** *(translated)*

- The team has a good scientific output in terms of products (services, software and standards) and articles. Its service to the national and international scientific community, and to the non-academic world, is remarkable.

## **Recommendations** *(translated)*

- The committee encourages the CDS research team to supervise a greater number of theses. — [done, now 3 PhD. students](#)
- The committee recommends assessing the human and material requirements needed to cope with the expected increase in the volume and complexity (multi-messenger, multi-dimensional) of the data ingested by the CDS.  
— [done continuously](#)
- In addition to the services provided to the data center, the committee calls for the research team's scientific scope and priorities to be redefined, in order to give greater prominence to these activities. In this context, the committee suggests that **the team consider appointing a deputy manager in charge of research-related activities**, in order to raise their profile within UMR ObAS and IR CDS.  
— [discussion started, also see the Science Team presentation tomorrow](#)



## Recommendation:

“We recommend CDS develops plans for collaborative ventures for deploying machine learning technologies.”

## Response:

We thank for the council for this recommendation, there are very big developments happening for AI, in particular the large language models (LLM) and the emergence of ChatGPT for example. We expect these new kinds of technologies to have an impact on different aspects of the CDS work, and we are seeking ways to build our knowledge and understand how to benefit. The CDS R&D program has touched on these topics, and we recall that the CDS ChatBot prototype is an ongoing project. Pierre Ocvirk has tested various uses in the context of Vizier treatment of catalogues, and CDS has also been involved in the Deep Learning project within the ESCAPE project (with ESO and HiTS as partners). **We are still however at the very early stages and we have not yet had the capacity to strongly engage with the potential partners within CNRS or UNISTRA.** Some of the candidates for scientific positions would have brought in expertise, but these potential recruitments have not eventuated. We have however engaged with our close partner SAO/ADS on these topics and discussions at the AAS meeting (Jan 2023), ADASS (2023) and during a recent visit to ADS (November 2023) are leading to CDS participation in AI focused activities that have been advanced by the ADS team. **We expect this to develop further in 2024 with the idea of joining ADS initiated workshops on these topics in mid-2024. We note also that CDS is participating in a new initiative at ObAS of an AI working group.** This recommendation will be closely followed into the future as AI has the potential to change many aspects of information processing.



## Recommendation:

We recommend CDS continues to follow developments in the French and European research landscapes in terms of digital infrastructures (e.g. CNRS plans to develop a combined HPC / HPDA offer for national research infrastructures, EOSC, EuroHPC) and to take advantage, where appropriate, of the opportunities offered.”

## Response:

CDS is in contact with representatives of these infrastructures in some of the new activities undertaken in the last year, in particular the CDS participation in the **MESR “Groupe Thématique Infrastructures de Services aux Données (ISD)” (Thematic Group on Data Infrastructure and Services)**. This enables us to follow the developments and also to make CDS visible in this national level group. **CDS is also strongly involved in EOSC at the French and European level through the ESCAPE project (now collaboration), the EOSC Future project, and participation in one of the EOSC Association Task Forces (M. Allen member of the “Researcher Engagement and adoption Task Force” 2021-2023).**



## Recommendation:

We recommend that CDS makes a conscious choice for an informal channel of communication with the user community, stopping short of a user committee. This could be as simple as e.g. a whiteboard at AAS, EAS and ADASS, where there is an opportunity to educate the community on the services available, combined with a constantly-open channel such as querying the community on social media. We see this as fending off the future possibility of disengagement with the community, rather than solving any obvious current problem.

## Response:

The CDS has had an active social media presence in the past year, although not as active as in the 50th anniversary year which also included many Gaia data release events. We do however expect a shift of emphasis away from Twitter/X because the use of this platform is becoming more difficult in that users without accounts may not be able to see posts etc., as well as a concern for the integrity of this platform.

We have however been very engaged in live astronomy community events as highlighted in section 3.1, with specific events proposed and co-led by CDS at the National SF2A, and European EAS conferences.





## Recommendation:

Given the expected growth of data from new instruments in the coming years and of the user community, it becomes more and more important to define procedures to take decisions and criteria for prioritising and selecting (for example) data to ingest and feature requests to include. We recommend that the processes for prioritisation and decision making are made clear to the CDS Scientific Council. We were pleased to see plans for SKA regional centres with CDS HiPS nodes being deployed remotely (rather than CDS being an SKA regional centre itself).

## Response:

In response to this recommendation and also to the discussion on this topic at the 2022 Council meeting, we have formalised the strategy for the ingestion of large survey data in HiPS format into the CDS All-Sky-Data system which serves as the major global ‘HiPS node’. For VizieR and SIMBAD the policy is already well established with the various journals, and arrangements with agencies/observatories such as ESA and ESO. The ingestion of HiPS data is a much more recent activity, which has been set up by the CDS development of HiPS and subsequent IVOA standardisation. We are witnessing a strong growth of the HiPS network, into which any astronomy data centre can publish, but we note that the CDS is still the major node. We have produced an CDS internal document on the [‘HiPS ingestion strategy’](#) which is included in Appendix 1 of this report. We have also added information to the public Aladin FAQ, and we intend to make this information more visible in the coming year on the CDS web pages and also in our interactions in the community. We expect that the publication of HiPS data will become important with EUCLID, LSST, SKA data, so we wish to make the CDS approach to HiPS publication well known in the community to maintain a leading position.



## Recommendation:

The Aladin All-sky service relies on a 5 Pb storage that will need to be replaced in the next few years. As replacing such a large amount of disk may be problematic, we recommend that CDS discuss upstream with INSU to plan a solution.

## Response:

The needs for a major renewal of the CDS All-Sky-Data system were presented at the meeting with CNRS-INSU in January 2023. This item has also been indicated on our previsional CNRS budget requests for a number of years showing the need for funding in 2024-25 for the renewal. We have been in discussion with CNRS-INSU and CNES about the request and we hope to have confirmations about the 2024 budget before the end of 2023.

# □ Summary

- A busy year for CDS.
  - Responding to changing conditions.
  - Strong demand for CDS participation in Open Science actions at National and European level.
- High level production and service renewal
- Important progress on core work of operating, maintaining and developing CDS reference services
- Lot of effort toward engagement in the new aspects of the CDS mission - Recherche Data Gouv and SKA.