

# CDS Plans and challenges

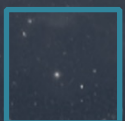
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CENTRE DE DONNÉES  
ASTRONOMIQUES DE STRASBOURG



# □ CDS Strategy

- **Constantly evolving** — based on scientific needs
- **Main strategy** for core services is well established:
  - Pursue the CDS mission at the highest possible level
  - Science-driven Data Centre for “reference” data
  - Spirit of Open Science, and application of FAIR principles
- **Themes**
  - Reinforcement of core mission** — trusted reference data centre
  - Enabling science with the CDS services** — supporting specific scientific projects, direct support of astronomers, and development of the CDS science team
  - Engagement with the astronomy community**
  - Adaptation and innovation** — responding to science needs and increasing volume
  - Building on success of CDS by maintaining specialised staff profiles & teamwork**

# □ Plans 2021-2022

## Continuation of core work of building CDS content and operating services.

### Immediate topics:

- Managing with the current continuing uncertainty.
- Re-grouping to **address the consequences of 2020-2021.**
- Work toward a “*new normal*” with different rhythms.
  - Tele-working (up to 2 days for various roles).
  - Include Virtual conferences/meetings as part of regular operations.
  - Put high value on in-person interactions.
  - A changed approach to travel / missions



# □ Plans 2021-2022

- **CDS Service Developments.** *(From yesterday's presentations)*
  - SIMBAD object types
  - Deployment of BCS (CDS Biblio)
    - Manage with changes in publisher systems
  - Progress on New Sesame
  - VizieR 2 - planning
    - Establish an approach for the very large data sets - answering 'should CDS develop such capacity?'
    - Survey of up-coming missions and surveys
    - Engage a contract engineer for VizieR
  - Progress on the new X-Match prototype
  - Aladin Lite v3.





- CDS Web Pages
- CDS Hotline
- Improvement to CDS code tracking - Gitlab, Github
- Transition to domain name [cds.unsitra.fr](https://cds.unsitra.fr)
- SIMBAD Web interface / APIs
- Jupyter notebooks
- Follow-up opportunities with planetariums



# □ Plans 2020-2021

- **CDS infrastructure**

- Delays for more moves into the UNISTRA data centre
- More investment in our server room for electrical redundancy for cooling system
- Continue investments in hardware - servers / cold-storage
  - Virtual servers and controllers
- Plan for major upgrades: All-Sky-Data ~ 5PB in ~2025
- Continue program of workstation improvements
  - (laptops / desktops / monitors )



# □ Important data sets in 2022

Maintain approach of being as complete as possible with main astronomy journals

What is the “reference data” from future large missions/surveys that should be made available at CDS ?

- ‘Complete’ the future-watch table

2022:

- Gaia DR3
- GSC 2.4
- PanSTARRS DR2
- ESO catalogues
- +++

Telescope/instrument	Number of records	ETA	manageable at CDS? (tech-wise)	Band/depth
Gaia all epochs	$10^9 \times 100 \text{ epochs} \sim 1e11$	2022-2024	yes	optical wide
Gaia flat	$1.7 \times 10^9$	available in Vizier	no	optical wide
Pan-STARRS DR1-2 all epochs	$2.10^9 \times 10 \text{ epochs} \sim 2 \times 10^{10}$	done	yes	optical wide
Pan-STARRS DR1-2 flat	$2.10^9$	DR1 in Vizier	~yes?	optical wide
ESO Phase III cats	$1-2 \times 10^9$	ongoing	yes	optical/NIR wide
LSST/Rubin all epochs	$4 \times 10^9 (\sim 250 \text{ epochs}) = 10^{13}$	2025-2030	yes	optical wide
LSST flat	$40 \times 10^9$	2025-2030	yes	optical wide
EUCLID	$\sim 10^{10}$ galaxies	2028 and beyond	yes	optical/NIR wide
JWST	deep extragal surveys, narrow FoV, high res	2022 and beyond	yes	NIR deep
Nancy Grace RST	a few $10^9$ stars, $4 \times 10^8$ galaxies	launch 2027	yes	orange / NIR deep/medium wide
ELT	~narrow FoV, very high res (0.005")	2027	yes	optical/NIR deep
Giant Magellan Telescope	deep extragal surveys, narrow FoV, very high res (0.01")	2029	yes	optical/NIR deep
TMT	deep extragal surveys, narrow FoV, very high res (0.015")	2027	yes	NUV/optical/mid-IR
21cm / SKA	up to $10^9$ gals	2030-ish?	yes	radio wide deep
GW: LIGO/PTA/LISA	?	operating and upcoming	yes	grav. wave
CTAO	?	2024	yes	gamma
KM3NET	?		yes	neutrino
ATHENA	?		yes	X-ray
SVOM	several $10^5 - 10^6$		yes	gamma

Future-watch - missions/surveys





# 50 eDS

1972-2022





# CDS-50 Schedule:

January - A kick-off webinar announcing the year of events  
- Webinar series

February 21-24 ESCAPE VO School to be held in Strasbourg (Hybrid mode)

May - Gaia DR3 - CDS contribution to the ObAS Gaia DR3 events

June 12-16 - AAS Summer Meeting - CDS Booth - 50th anniversary

June - SF2A - investigating whether we can highlight CDS-50 at a session/other

June 27 - July 01 - EAS Annual meeting (Valencia, Spain) - CDS Lunch Session (accepted!)  
- CDS booth - 50th anniversary

Aug 16-27 : IAU (Busan, Korea) - CDS booth - 50th anniversary

September 11-16 : ADASS (Victoria, Canada) - CDS booth - 50th anniversary

## **October / November:**

### **Conference/workshop**

**- Open science in Astronomy ‘from pixels to publications’**

(18-20 October?) (followed by school holidays)(Parliament session 17-20)

(8-10 November (followed by 11 November holiday)

(15-17 November)

(22-24 November) (followed by Strasbourg Christmas Markets)(Parliament session 21-24)

## **Other activities:**

- Open a survey on the use of CDS services
- Make use of network to present CDS-50 in seminars at targeted institutes/countries
- Communication materials (short film?)



## Open Science in Astronomy - *from pixels to publications*

On the occasion of the 50th anniversary year of the Centre de Données astronomiques de Strasbourg (CDS) in 2022, we propose to organise a conference on Open Science in Astronomy. The CDS has been at the forefront of data sharing in astronomy and we wish to celebrate 50 years of progress of the CDS services in a conference that attracts major actors in the international astronomy community, as well as CDS partners and representatives of the French Open science community to look forward to the future plans and challenges of Open Science in astronomy.

The themes of the conference will be developed along the lines of :

- The use of Open Science tools and services for astronomy research
- Current and future reference data sets in astronomy
- Plans and challenges for bibliographic services in astronomy
- Innovations to support scientific discovery with big a rich astronomy data sets
- The FAIR principles in astronomy and beyond.
  - FAIR - Findable, Accessible, Interoperable and Re-usable

# □ Challenges - staffing

- **Administration**
  - CDS cannot work without administration - **long term replacement essential**
    - Contracts, Projects, Reporting, and an increased administrative load
- **Permanent Researchers**
  - 10 researchers — FTE ~3.75 (+1 Emeritus)
  - To be addressed by CNAP and CNRS candidates, & mobility (?)
- **Documentalists** - increased load needs to be addressed
  - Contract positions being opened in 2021/2022
  - **Replacement for the departure of a documentalist is essential**
- **Software Engineers**
  - **Contract engineer recruitment for Vizier URGENT**
  - **Research Engineer retirement - 2024 !! replacement needed on this timescale**
  - Research engineer (bibliography) retirement ~2029



# □ Summary

- **A busy year ahead in 2022**
  - Re-grouping to work toward the CDS mission
  - Preparation of the HCERES evaluation (of ObAS)
- Many very exciting things to do in the community
  - A lot of innovations, improved services, and the message of Open Science
  - CDS-50 as a theme throughout the year with specific events
    - Strengthen links with partners
- Projects - working well, helping to prepare the future, and connection with the wider world of data sharing and large astronomy projects
- Staff & team support necessary — work together to meet the challenges

