

Schedule

Monday November 7

10h30 - **Welcome and introductions**

10h40 - **CDS Presentation and Activity Report** (*M. Allen*)

11h30 **SIMBAD** (*A. Oberto, C. Loup, S. Lesteven +*)

12h Lunch (Buffet - for all CDS + council)

13h30 **Aladin + Aladin Lite** (*P. Fernique, Caroline Bot, T. Boch +*)

14h **Vizier** (*G. Landais, P. Ocvirk, T. Boch +*)

14h30 **X-match** (*F-X. Pineau, T. Boch, S. Derriere +*)

14h45 – Coffee break

15h15 **Portals – CDS developments & AstroDeep**
(*T. Boch, S. Derriere*)

15h35 **R&D** (*A. Schaaff +*)

16h05 - 16h30 **Gaia in CDS Services Demo** (*T. Boch, A. Siebert*)

19h Dinner (Council Members) [Restaurant]

Tuesday November 8

9h **Science Team work** (*B. Vollmer +*)

9h20 **Biblio Team work** (*E. Perret +*)

9h40 **CDS prospective and future plan** (*M. Allen*)

10h - Coffee

10h30 - 14h30 **Closed sessions** (*including Lunch for Council members*)

New Council 2016-2018

Patricia Whitelock (SAAO, UCT) [President]

Ajit Kembhavi (IUCAA, Pune)

Hashima Hasan (NASA Headquarters)

Danny Lennon (ESA)

Olivier La Marle (CNES)

Jan Palous (Academy of Sciences of Czech Republic, Prague)

Michael Sterzik (ESO)

Alessandro Boselli (Laboratoire d'Astrophysique de Marseille)

Thierry Forveille (IPAG, Grenoble)

Franck Le Petit (LERMA, Observatoire de Paris)

Deborah Paradis (IRAP, Toulouse)

Denis Veynante (CNRS)

- From CDS' authorities: **Martin Giard** (INSU), **Paul-Antoine Hervieux** (Université de Strasbourg)
- Invited: **Hervé Wozniak** (Director of Observatoire de Strasbourg)

Centre de Données astronomiques de Strasbourg

Mark Allen and CDS Team



CDS Scientific Council, 7-8 November 2016



Since 1972...

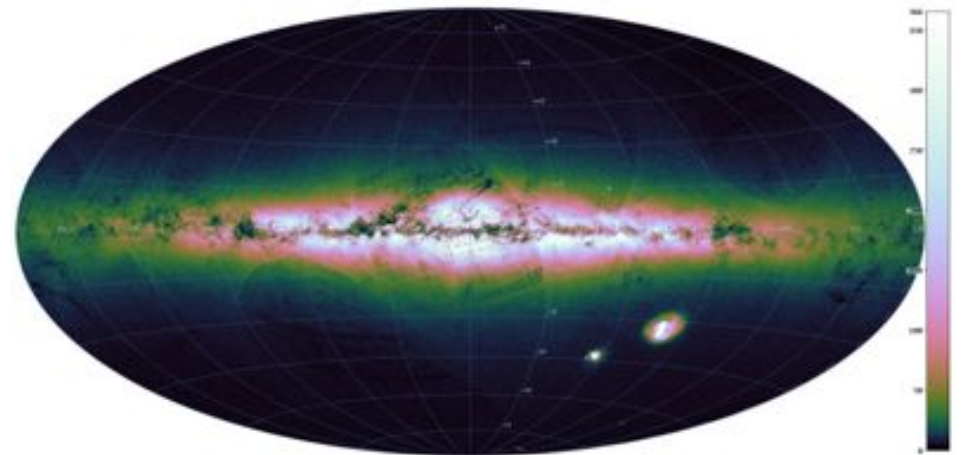
- Collect useful data on objects in electronic form
- Improve them by critical evaluation and combination
- Distribute the results to the international community
- Conduct research using the data

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*

Astrophysics today

- **Science questions drive the need for:**
 - multi-wavelength, multi-messenger observations
 - an All-Sky approach using ‘Big Data’ surveys
 - combination of archival data and information in publications
- **Reference Services**
 - are essential for:
 - Qualified information
 - Interoperability
 - Enabling science



Gaia mission data – released Sept 14, 2016 by CDS

CDS Reference Services



Astronomical Objects :

IDs, bibliography, measurements



Catalogue Service :

Catalogues, published tables, observation logs, surveys, associated data: images, time series, spectra etc.



Visualisation and integration :

images, catalogues, archives, VO portal, All-sky capabilities



X-Match : *Catalogue cross-match*

VO compatible



Certified



Collaborative:

ESO
ESA
CNES
NASA
ADS
NED



CDS Reference Service Content



Astronomical Objects :

~8.5 million objects, ~24 million ID, 14 million citation links



Catalogue Service :

*15366 Catalogues, 32991 published tables, 19.2 billion rows, millions of associated data: **spectra, time series, images***



Visualisation and integration :

325+ HiPS surveys: images (105 TB), catalogues, archives, VO portal, All-sky capabilities



X-Match: All CDS catalogues



Services for the global astronomy infrastructure

- Leadership and participation in global standardization 
 - Framework for global astronomy interoperability
- Provision of services and software components (tools) that are used by many archives and data centres (astronomical object name resolving, visualisation, data access)
- Contribution to the wider data sharing and Open Data initiatives

CDS – a vital part of the global astronomy infrastructure



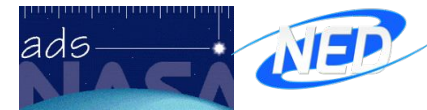
Ground and Space
Observatories,
Instruments and missions



Archives, Services



Astronomy Data Centres



CADC, MAST, HEASARC, IPAC, + ...

Virtual Observatory



20 members

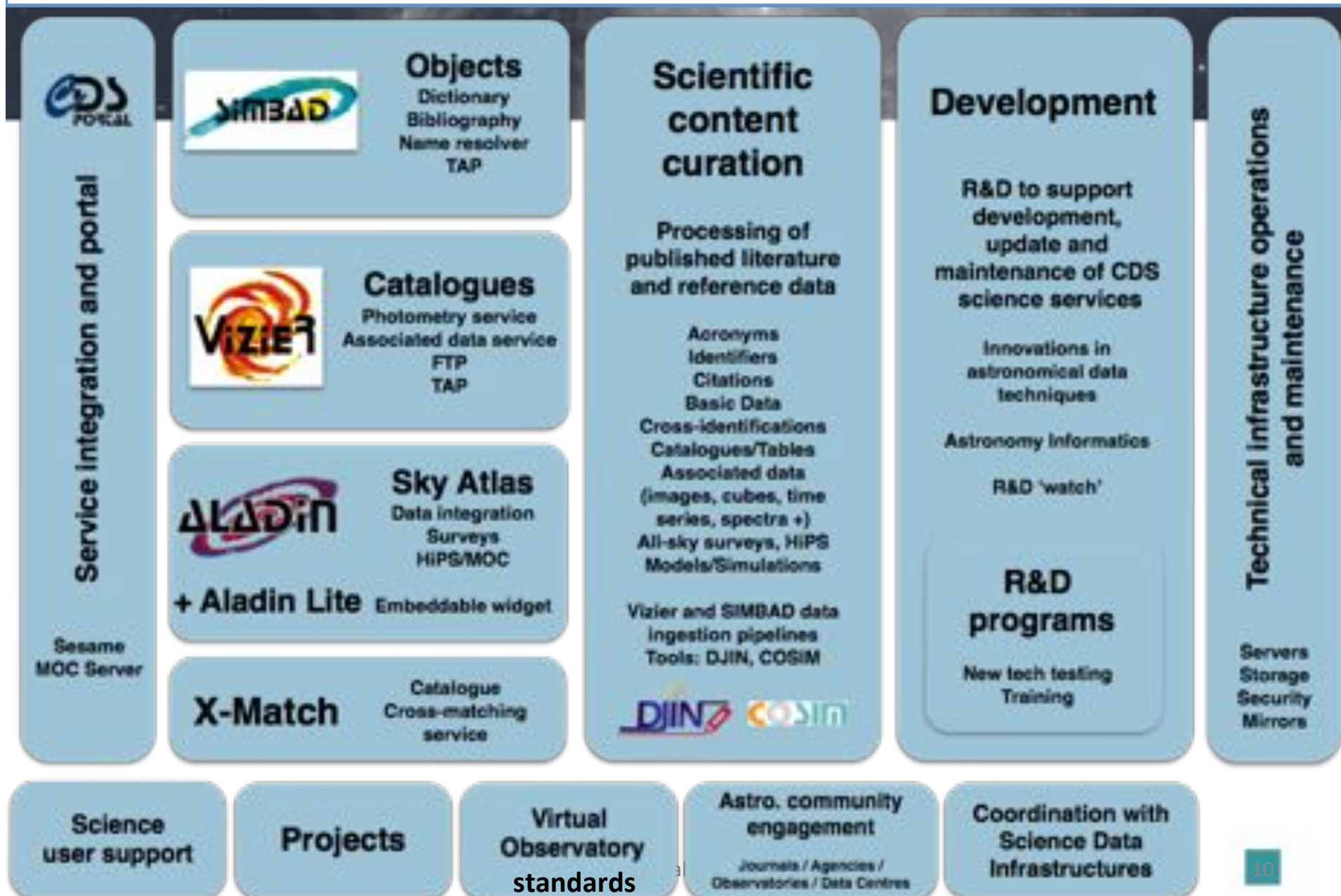
Data e-Infrastructures



Journals



CDS activities



Expertise of integrated team

- **Scientists** (3 CNRS, 7 CNAP)
 - Necessary expertise of active scientists covering wide range of astrophysics research areas, requirements, guidance, tests, dissemination, inspiration
- **Software Engineers** (8)
 - Development for astronomical applications with high level of Science ↔ IT interaction. Important R&D to evolve the services
- **Documentalistes** (10)
 - Special profiles for data ingestion from literature with high level of quality and scientific guidance
- **Interns** (~10), **Students** (2), **Post-docs** (2), **Contractors** (5)
- **Admin Staff** (2), **Admin & IT Support shared with OAS** (4)

Governance

- **Infrastructure de Recherche on MENESR National Roadmap**
- **Authorities: CNRS-INSU & Université de Strasbourg**
 - these authorities nominate the CDS Director
- **International Scientific Council**
 - 3 year term (2016-2018)
 - Representatives from ESO, ESA, NASA, CNES
 - *Currently South Africa, India, Czech-Republic*
 - *French astronomy community representatives*
 - *Invited: Director OAS, CNRS-INSU, UdS VP-Research*
 - Annual meeting and written report

CDS an integral part of the Observatoire astronomique de Strasbourg

- A host institution of the *'right size'*
- Synergies: *Scientific, Technical, Organisational*
- CDS gains access to scientific expertise
- Strong coordination with OAS Director

CDS within the Université de Strasbourg

- CDS provides pioneering expertise for Science Data Sharing
- Supportive University environment
 - Education, research, training
 - Excellent regional relations with engineering schools and other universities

French Astronomy (+)

- Prospective Astronomie et Astrophysique de l'INSU 2014:
 - “... CDS, infrastructure de recherche, pilier incontournable des bases de données françaises”
- Complementarity with other ANO5 labeled activities.
 - CDS plays supporting role
- Coordinator of INSU Action Specifique Observatoire Virtuel (ASOV)
- Partnership with CNES – space mission data & tools
- CDS supports French strengths in data driven science

European Astronomy

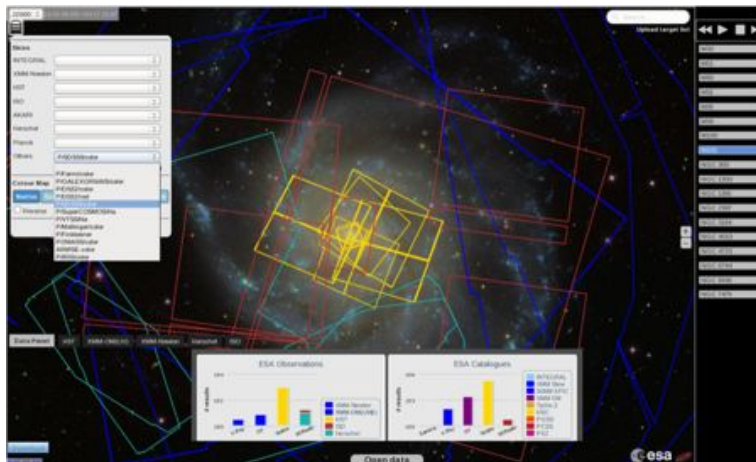
- Partnerships:

- Astronomy & Astrophysics Journal



addressing the European community needs

- ESA and ESO – the major Astronomy Infrastructures. Recently adopted CDS HiPS and Aladin Lite into their archives and systems



Collaborative approach –
mutual benefits for shared and
interoperable systems

European Projects

- Leadership of Euro-VO 
 - Series of 6 European projects 2001-2015
 - 4 led by CDS 2006-2015 (Development projects → Sustainability study)
 - Contributions to Astronet
- ASTERICS H2020 cluster project 
 - 2015-2019, ~20 partners, 15 M€
 - CDS leads Data Access, Discovery, Interoperability Work Package (WP4)
- RDA Europe project 1,2 & 3
- FP7 Science Projects: ASTRODEEP, VIALACTEA
- AENEAS H2020 – SKA data Centre Design study
 - starting Jan 2017 (CDS is a minor partner)

International Astronomy

- CDS services used as essential components of major Astronomy Data Centres and observatories
- Partner with Harvard Smithsonian/NASA/ ADS
 - Astrophysical Data System – prime astronomy literature database (*CDS-ADS roles well defined*)
- Arrangements with major journals
- Founding member and leadership roles in the International Virtual Observatory Alliance (IVOA)

IVOA

- Framework for interoperable and efficient access to astronomical data and services
- e-Science for Astronomy
- Based on Global standards

CDS – a major contributor and leader

21 standards (2011-2016), 12 with CDS author

CDS services VO compatible and leading the way



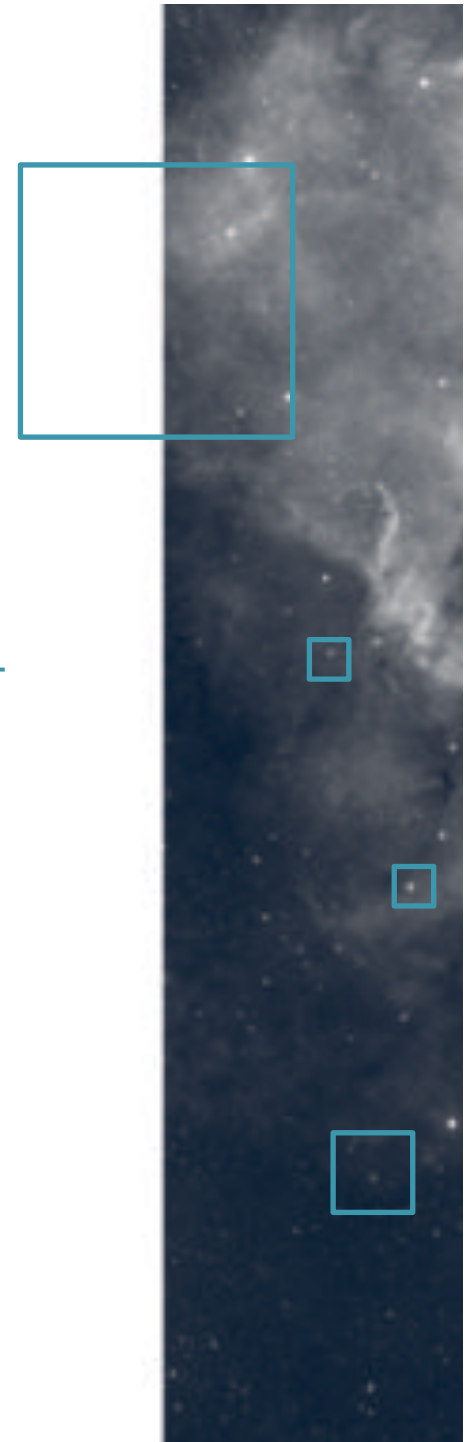
Data Sharing

- CDS participates in the Research Data Alliance (RDA)
 - ‘building the social and technical bridges that enable sharing of open data’
 - Builds on experience of Astronomy being at forefront of data sharing
 - Common framework for data infrastructures is in line with CDS strategies

CDS 2015 – 2016



CDS Scientific Council, 7-8 November 2016



2015 - 2016

- First year under new director
- **Core work of building CDS content and operating services**
- High level strategy and plans
 - Preparing for evaluations
- Re-organisations of some CDS processes/teams
- Connections and Collaborations
- Interactions with users – schools and training events
- **Projects** – ASTERICS, ASTRODEEP, VIALACTEA, ARCHES, RDA, Europlanet

- CDS renewed as “IR” on the French national Research Infrastructure roadmap



- CDS among other infrastructures:
 - Intl. (ESO)
 - CFHT, IRAM
 - IR
 - HESS, ESO-INSTRUM, LOFAR-FR

CDS
Centre de Données astronomiques de Strasbourg

Type de l'infrastructure : Unité mondiale de recherche

Statut de l'infrastructure : Unité mondiale de recherche

Localisation de l'infrastructure : Strasbourg

Localisation des autres sites : Infrastructure virtuelle

Responsable de l'infrastructure : Mark ALLEN

Exploitation : 2012

Tutelles / Partenaires : CNRS, Univ. Strasbourg

Contact en France : mark.allen@cds.u-strasb.fr

cds.u-strasb.fr

La Mission du CDS est de collecter homogénéiser, distribuer l'information astronomique pour le bénéfice de l'ensemble de la communauté internationale. L'objectif est de faciliter l'accès des astronomes en regroupant de l'information dans une base de données, avec des liens avec les archives d'observation, les journaux astronomiques et les autres bases de données, en particulier ACS et NED. Le CDS est l'un des acteurs majeurs du développement de l'Observatoire Virtuel (OV) astronomique, qui vise à donner un accès transparent à l'ensemble des ressources en ligne de l'astronomie.

Le CDS développe des services largement utilisés par la communauté. SIMBAD, la base de données de référence pour les observations et la littérature pour les grands relevés du ciel, les catalogues et les tables publiées dans les journaux académiques, et de plus en plus pour d'autres types de données accessibles aux publications. Cette interface du ciel nous permet de donner accès dans les archives des observations, soit en ligne, et à partir de 2012 le meilleur service d'identification croisée de tous les catalogues.

En 2014, les services ont généré plus de 800 000 requêtes par jour, 679 articles dans des revues à accès libre ont été cités par SIMBAD, 806 Visuals et 18 Auteurs sources ACS.

IMPLICATIONS SOCIO-ÉCONOMIQUES

Collaborer avec les éditeurs académiques et les publishers des journaux astronomiques de la discipline pour améliorer les publications de faits vers les données. Dès 1989, le CDS a mis en ligne par Internet les tables publiées dans le journal *Astronomy & Astrophysics*.

DONNÉES

Estimation du flux de données : Le CDS fournit des services permettant d'accéder à des données et de les exploiter. Ces données incluent celles qui ont été produites à disposition, mais aussi celles des archives des observations via des liens et l'intégrabilité de l'Observatoire Virtuel.

Stockage : Environ 1 Pb

Accessibilité : Les données et les services sont en libre accès.

Présence dans des répertoires de données : Les services sont disponibles en l'Observatoire Virtuel. Le CDS est membre du World Data System (www.iau.org/wds) de l'ICAR et a obtenu la certification Data Seal of Approval (www.observationcenter.org/dsa).

Coût de l'investissement : 5,7 M€

Coût RH : 2627PY

Dimension Internationale

Le CDS est le Service SIMBAD (www.cds.u-strasb.fr) de l'Observatoire Virtuel européen Euro-VIS. Celui-ci est membre de l'ESA.

Coordonnées : ESA-International Virtual Observatory Alliance

Partenaires : Euro-VIS: FR, DE, ES, IT, UK
SIMBAD: CA, CL, AR, AN, AU, BR, CA, CH, CN, DE, DK, FI, FR, GR, HU, IL, IN, JP, KR, NL, RU, SA, US
Site internet : www.cds.u-strasb.fr



LIST OF RESEARCH INFRASTRUCTURES ASTRONOMY AND ASTROPHYSICS

| TYPE | NAME | FULL NAME |
|---------|-------------------|---|
| IO | ESO | European Southern Observatory |
| | ESO ALMA | Atacama Large Millimeter/Submillimeter Array |
| | ESO EELT | European Extremely Large Telescope |
| | ESO LSP | La Silla & Paranal Observatory |
| VLRI | CFHT | Canada-France-Hawaii Telescope |
| VLRI | IRAM | Institute for Radio Astronomy at Millimeter wavelength |
| RI | CDS | Strasbourg Astronomical Data Centre |
| RI | ESO-INSTRUM | Instrumentation for ESO large telescopes |
| RI | HESS ¹ | High Energy Stereoscopic System |
| RI | ILT-LOFAR FR | International Low Frequency Radio Array Telescope - LOFAR FR |
| Project | CTA ² | Cherenkov Telescope Array |

CNRS Committee for TGIR

- Official visit requested by CNRS
- Visit took place September 15, 2016
- We CDS presented as an astronomy reference data centre that is ***unique, essential, and works well***

Positive response:

- *Nous avons tous été impressionnés par la qualité de cette structure, de remarquable visibilité internationale, et qui servira à l'évidence de référence dans la construction des politiques de données de nombreuses infrastructures de recherche.*
- *Vous pouvez être assuré de notre soutien renouvelé dans le financement du CDS, dont nous espérons pouvoir accompagner au meilleur niveau les activités et les investissements futurs.*

HCERES evaluation – in progress

- *Haut conseil de l'évaluation de la recherche et de l'enseignement supérieur*
- 5 year evaluation of OAS
- CDS reports for
 - 2011 – 2016 activities and future perspectives
 - CDS as a national observing service
 - CDS Science team as part of the OAS
- Prospective and Strategy – provided to Council
- Visiting committee expected early 2017

Highlight: CDS Content 2015-2016



Astronomical Objects :

~8.5 million objects, ~24 million ID, 14 million cites
+0.5 million objects, +1.2 million IDs, 2.2 million c.



Catalogue Service :

15366 Catalogues +1270 Catalogues, +64
Catalogues + associated data (18k images, 2M
spectra), + 2 surveys LAMOST, CoRoT



Visualisation and integration :


325+ HiPS surveys: images (105 TB), catalogues,
archives +40% HiPS, +100% by volume



X-Match: All CDS catalogues

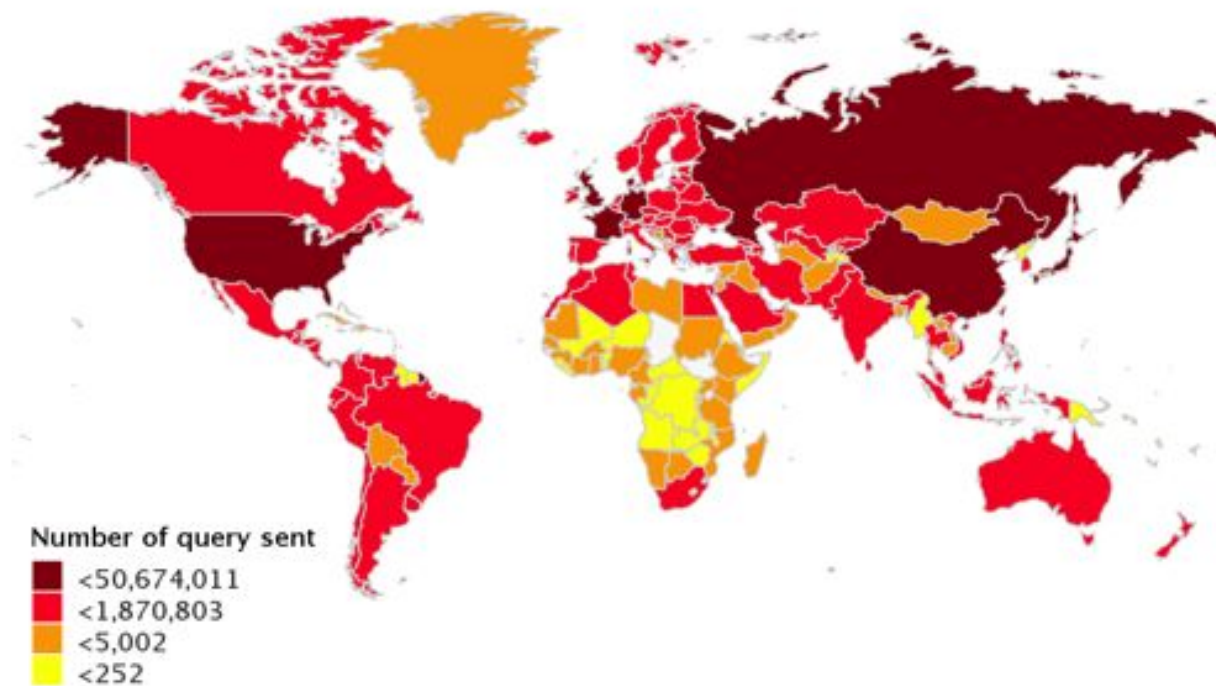


Highlights: citations and usage

- **Textual citations identified by ADS** 
- In 2015, **695** refereed papers cited the word **SIMBAD**, **384** the word **VizieR**, and **81** the word **Aladin**
- Usage Statistics – in detailed presentations
 - **SIMBAD** ~510 000* queries/day
 - **VizieR** ~380 000 queries/day
 - Cross-match ~600 jobs/day
 - **Aladin** + 11% actions/day, hosts +10%

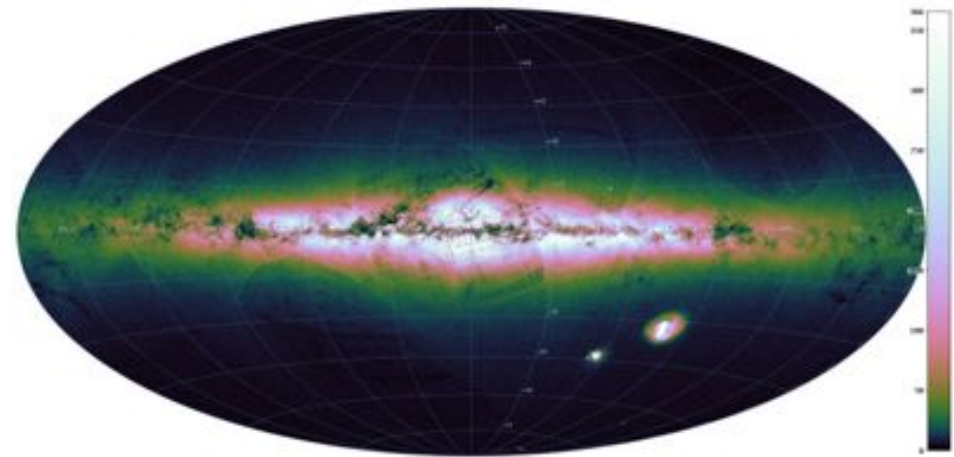
Highlights: CDS services are widely and heavily used

- *~800 000/day in 2015 to ~890 000/day in 2016*
 - *(but working to reduce by making queries 'smarter'/'efficient')*



Highlights: Gaia DR1 in CDS Services

- CDS a member of Gaia Coordination Unit 9
- Partner data centre for DR1
 - Planning, rehearsals, strict non-disclosure before release, Release 14 Sept 2016
- Gaia DR1 at CDS:
 - VizieR
 - TAPVizieR
 - Cross-Match Service
 - Aladin
 - HiPS catalogue



Density map of ~1 billion Gaia sources generated by CDS

Highlight: VizieR Associated Data Service

- Data associated with publications: spectra, time series, images

Search associated data among the VizieR catalogues

This web page is an access to the VizieR Associated data (images, spectra, timeseries, SED) which comes from publications. This tool is the result of the documentation assigned by the authors of the catalogues (in particular by A&A authors) and supervised by the GDS documentalist team (see the VizieR Ingestion tool).

VO compatibility
The meta-data and the search engine are built according to the VO framework (SIA, SSA, ObsTAP) and can so be queried by VO softwares. The data are gathered with the Saada engines, and the VO data model ObsCore has been chosen for the documentation.

Simple search [ObsTAP Query](#)

Search by position: 40.6697192 -0.0132889 radius: 1 deg

Search by spectral band: min max μm

Search by time data: start stop (MJD)

Search by catalog identifier:

Spectrum / Time series Image

500 entries max

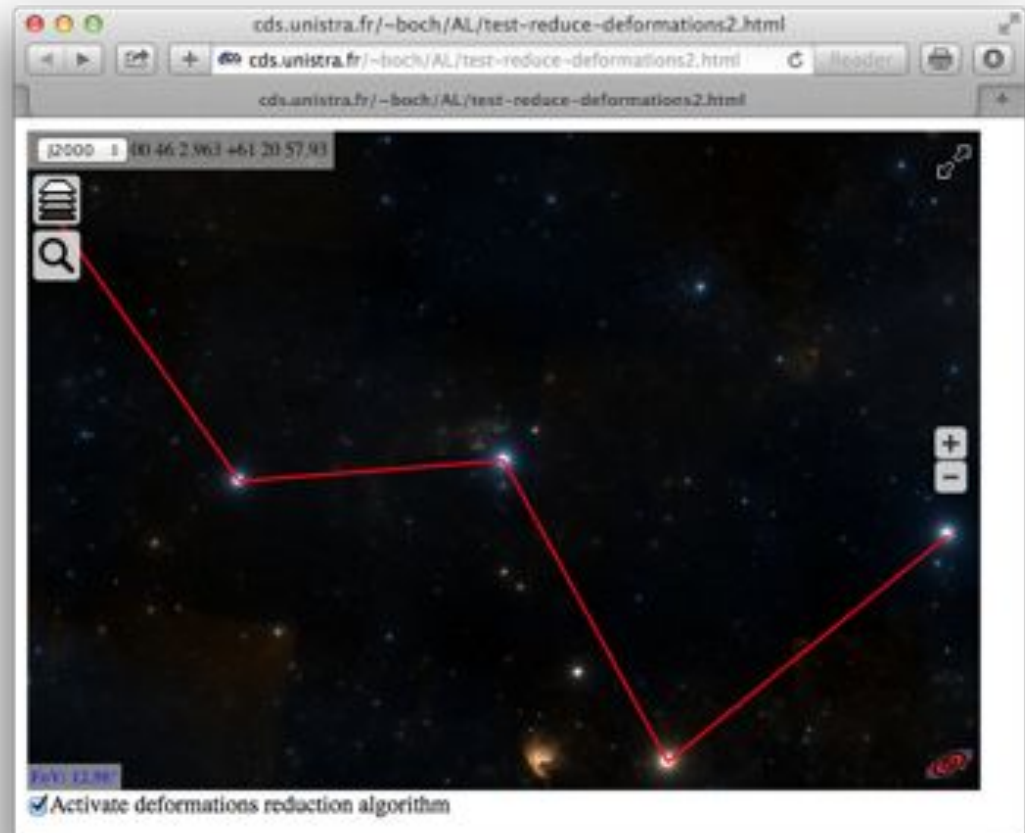
Search

Show 10 entries 500 entries Filter

| Preview | Target | Data collection | Ra | Dec | Band min (nm) | Band max (nm) | Begin time (MJD) | End time (MJD) | Facility | |
|---------|---------|-----------------|--------|--------|---------------|---------------|------------------|----------------|----------|--------|
| | NGC1055 | JIA+A568/A01 | 40.437 | 0.443 | 315.000 | 390.000 | | | SOSS | Header |
| | NGC1068 | JIA+A568/A01 | 40.670 | -0.013 | 315.000 | 390.000 | | | SOSS | Header |

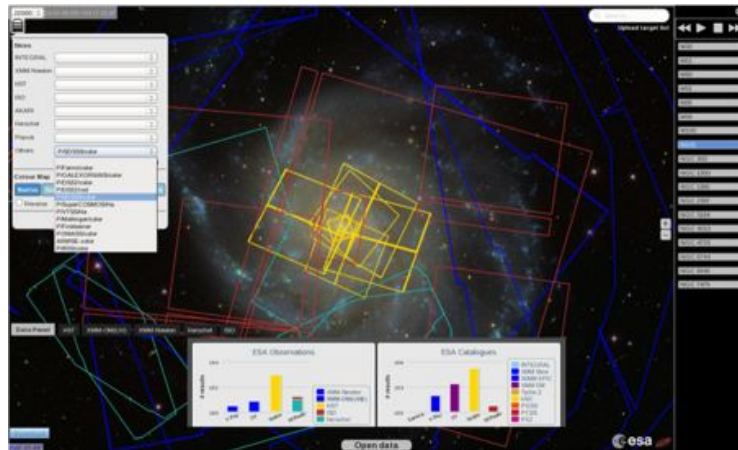
Highlight: Aladin Lite

- Implementations
- Critical improvements enable CDS Portal and ESASky
- Collaborations improve data quality and software

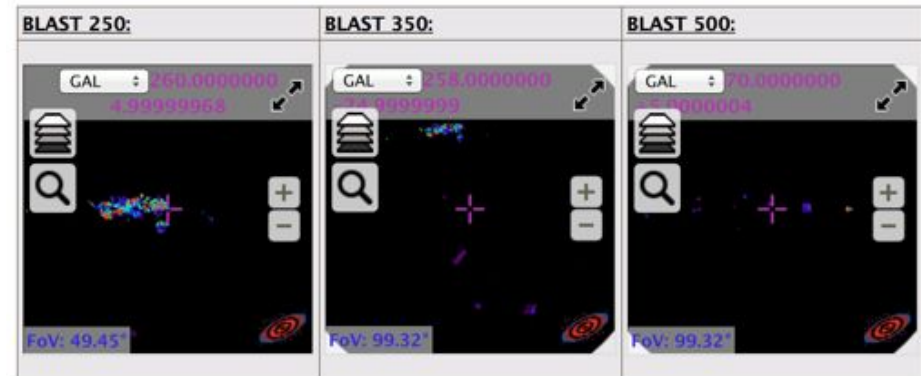


Aladin Lite / HiPS implementations

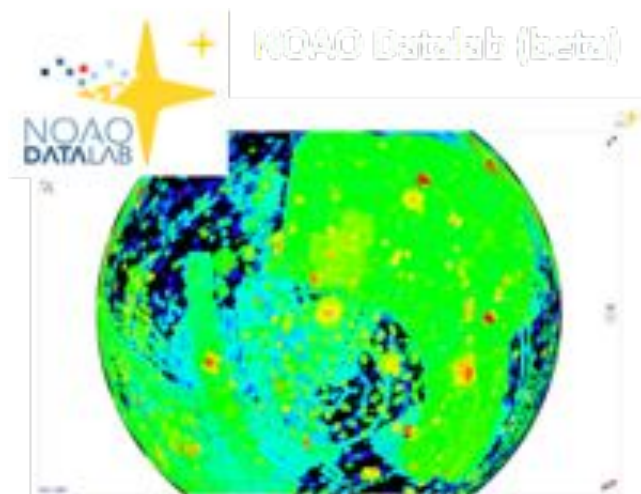
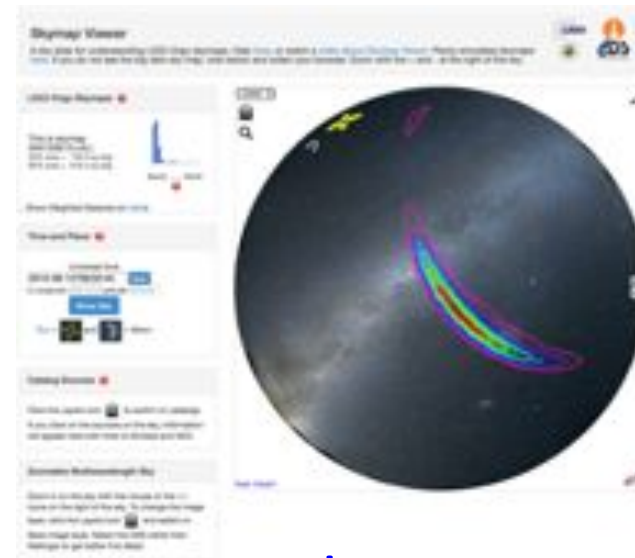
ESASky



IRAP/CADE



LIGO



+ many more

CDS Impact - dissemination

- Papers
 - Refereed papers provided (28 in 2015, 15 in 2016)
 - ADASS 2015 – 13 poster papers, 1 oral
 - *ADASS 2016 – 6 posters, 5 oral presentations*
- Invited talks include:
 - **LSST@Europe2** Meeting (Allen)
 - **ASKAP 2016** Meeting (Vollmer)
 - **SCIOPS** (ESA, ESO) (Allen, Genova)
 - High level Data Sharing presentations (Genova)

ADASS



Highlight: Specific Training Events

- The CDS Student Workshop on “Accessing and Analyzing Multiwavelength Astronomical Data”
 - SAAO, May 2016
- CDS tutorials at the Science Writing for Young Astronomers (SWYA) school
 - Puerto Varas, Chile in April 2016
- CDS tutorials at the ASTERICS DADI VO School in Madrid, December 2015 (*and preparations for the upcoming ASTERICS DADI School in Strasbourg to be held in November 2016.*)
- VO tutorials in various Doctoral Schools in Paris in march and May of 2016

Hands-on with CDS tools



Highlights

- Françoise Genova – Étoile de l'Europe prize
 - Prize of the *French Ministry of National education, Higher Education and Research*, for the CoSADIE project
- AENEAS Horizon 2020 Project approved
 - Advanced European Network of E-Infrastructures for Astronomy with the SKA

CDS Staff

- Mihaela Buga was successful in CNRS competition for a documentalist position (November 2015)
- François Ochsenbein departed after being at CDS from the very beginning (1971/72)
 - Instrumental in the creation and operations of many aspects of the CDS, in particular the catalogue services

Students, Postdocs, Contractors

- **Maxime Beuret** successfully defended his PhD thesis Sept 2016 (*supv. Cambrésy*)
- **Quentin Agobert** started PhD Sept 2016 (*supv. Siebert*)
- **Heddy Arab** started as Postdoc on VIALACTEA (Jan 2016)
- **Jenny Sorce** started as Postdoc on the ASTERICS project (Oct 2016)
- **Chaitra** started as Engineer for ASTERICS
- **Thomas Delacour** – Engineer (SIMBAD/bibliography)
- **Pascal Wassong** – Engineer (Astrodeep)
- **Vincent Kaestle** – Engineer (DJIN bibliography)

Changes to meet challenges

- CDS service integration and portal
 - New portal in development
- Process for large catalogues integrated more strongly in VizieR
- Re-organisation of Acronyms and Dictionary to enable shared workload. More mobility between SIMBAD and VizieR roles
- Updating/renewing tools used by documentalists
 - DJIN, bibliographic processing

CDS and VO

- Continuation of high level participation in, and leadership of VO
- VO implementations in CDS services
- HiPS standardisation in progress
- VO work in frame of ASTERICS project
- VO ADASS paper – *re-motivating VO, in particular for engagement with big projects*

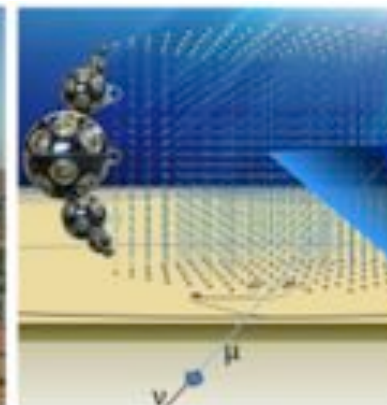
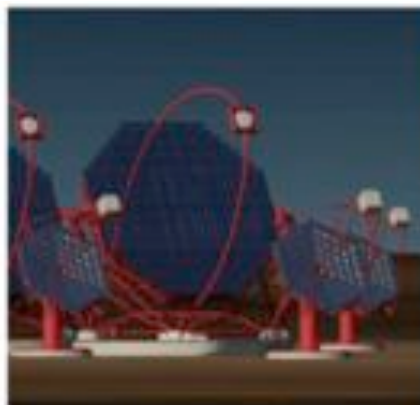
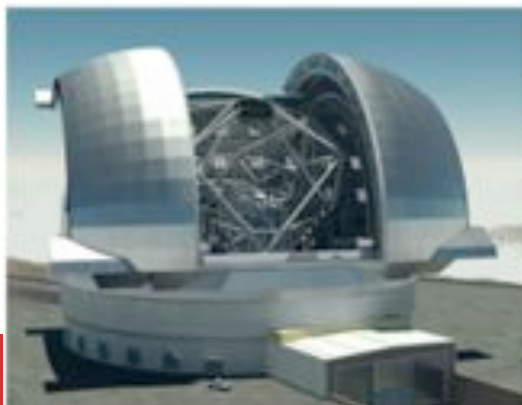
ASTERICS

- A €15 million Research Infrastructure funded by EC Horizon 2020 framework (2015-2019)
 - To help solve the **Big Data** challenges of European astronomy and astroparticle physics
 - To provide direct interactive access to the best European astronomy data in an international framework
 - *Cross-cutting synergies and common challenges*

concept and approach

- Supporting the European Strategy Forum on Research Infrastructures (ESFRI)
- Aspiring ESFRI projects + pathfinders
- Other world-class research infrastructures
 - e.g. LOFAR, Euclid, LSST, Virgo

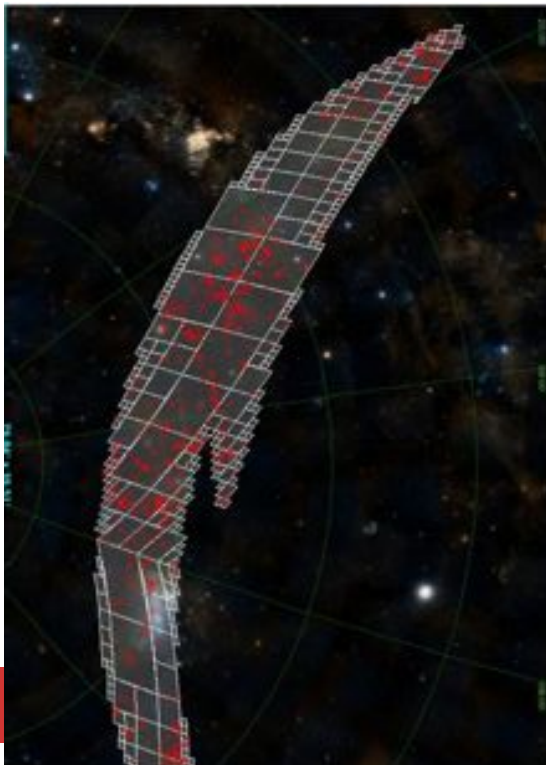
European Strategy Forum
on Research Infrastructures







ASTERICS connections: *gravitational waves*

ASTERICS fostered
use of VO for grav
wave EM follow-up



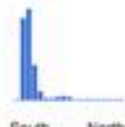
Skymap Viewer

A sky atlas for understanding LIGO-Virgo skymaps. Help [here](#), or watch a video about Skymap Viewer. Plenty simulated skymaps [here](#). If you do not see the big dark sky map, look below and widen your browser. Zoom with the + and - at the right of the sky.

LIGO  

LIGO-Virgo Skymaps

This is skymap
GW150914:LAL1
50% area = 149.0 sq deg
90% area = 616.4 sq deg





South North

Show Weighted Galaxies (or table).


Time and Place

Universal time
2015-09-14T09:50:45 [Now](#)
E Longitude (east long) Latitude (latitude)

[Show Sky](#)

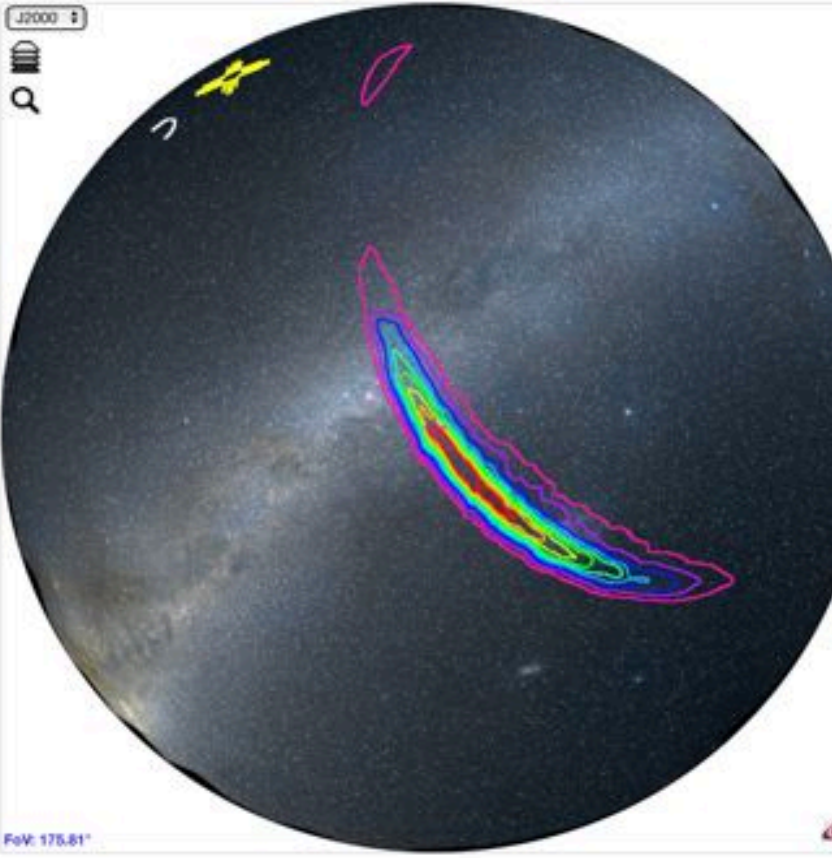
Sun =  and  = Moon

Catalog Sources

Click the Layers icon  to switch on catalogs.
If you click on the sources on the sky, information will appear here with links to Simbad and NED.

Zoomable Multiwavelength Sky

Zoom in on the sky with the mouse or the +/- keys on the right of the sky. To change the layers



J2000

FeV: 175.81°



*"Astronomy Librarianship
in the era of Big Data and
Open Science"*

Strasbourg
June 6-9, 2017

LISA VIII

[Home](#)

[Program](#)

[Venue and
Travel](#)

[Participants](#)

[Social
Events](#)

[Abstract
Submission](#)

[Register](#)

[Contact](#)

Library and Information Services in Astronomy

"Astronomy Librarianship in the era of Big Data and Open Science"

Strasbourg, European Doctoral College, France, June 6-9, 2017

Library and Information Services in Astronomy (LISA) is a series of scientific meetings for librarians and scientists that aims to provide a platform to discuss the state of the art of information maintenance, retrieval, delivery, and preservation and to learn from invited experts the directions in which our profession is moving.

LISA conferences cover such diverse topics as organization and management of books, journals, and specialized materials; electronic publishing (note that astronomy is a leader in the field); bibliographic and full text databases of astronomical literature; reports on collaborative projects.



Summary

- A busy year with many transitions
- Very good data ingestion rates and service usage statistics
- Connections made with partners, CDS visible in the community
- Interactions/feedback from users
- Projects finishing and new ones to begin
- VO – ASTERICS in full operation
- High level strategy prepared for TGIR visit and HCERES evaluation