

# CDS Activity Report 2016-2017

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Mark Allen - Director CDS



# □ 2016-2017

- **Core work of building CDS content and operating services**
- Special events:
  - Evaluations
  - Hosting of the LISA conference, plus Workshops/Schools & Visits
- Releases of new functions and data
- Planning of major upgrades to CDS service architectures and internal tools
- Contributions: IVOA, RDA
- Projects — ASTERICS, RDA, Europlanet, ASTRODEEP
- **Facing the challenges:** immediate and future



# □ Changes at ObAS

- Observatoire astronomique de Strasbourg
  - New Director of ObAS: **Pierre-Alain Duc** (Jan 2017 — )
  - CDS activities continue to be well integrated into its hosting institution
- System Engineer - welcome **Christophe Saillard** (Oct 2017 — )



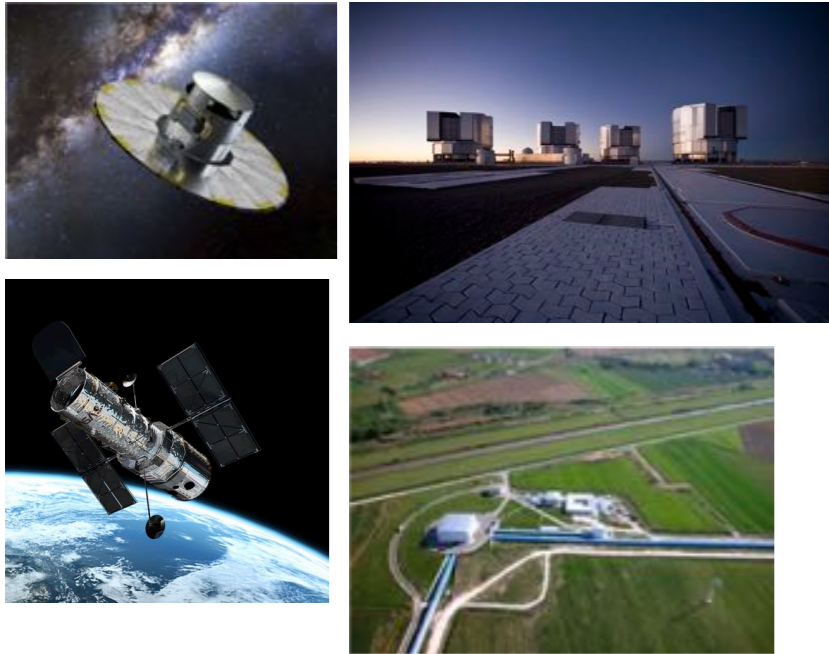
# CDS mission

- 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*

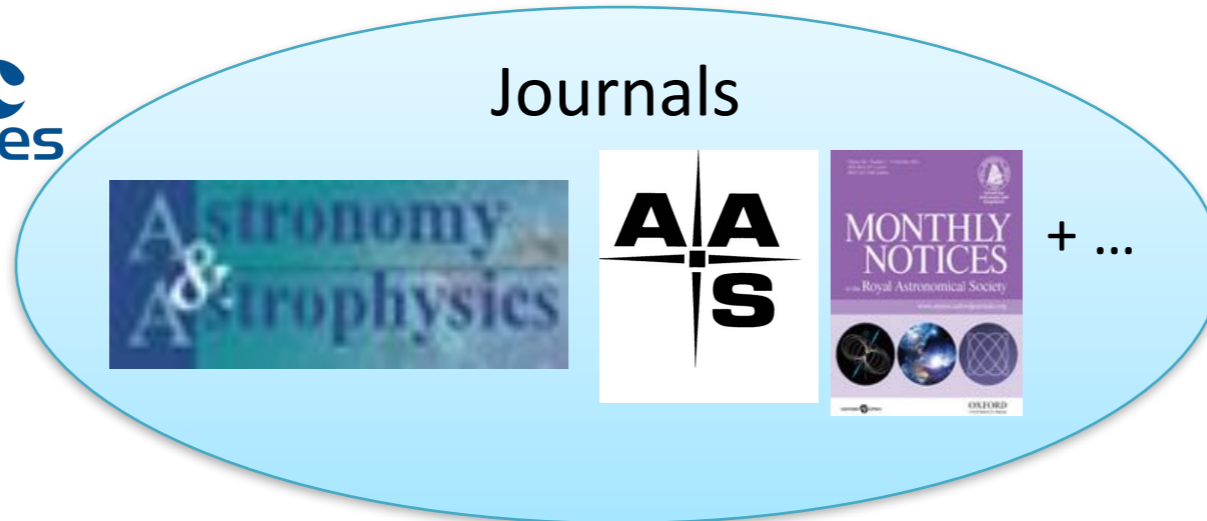
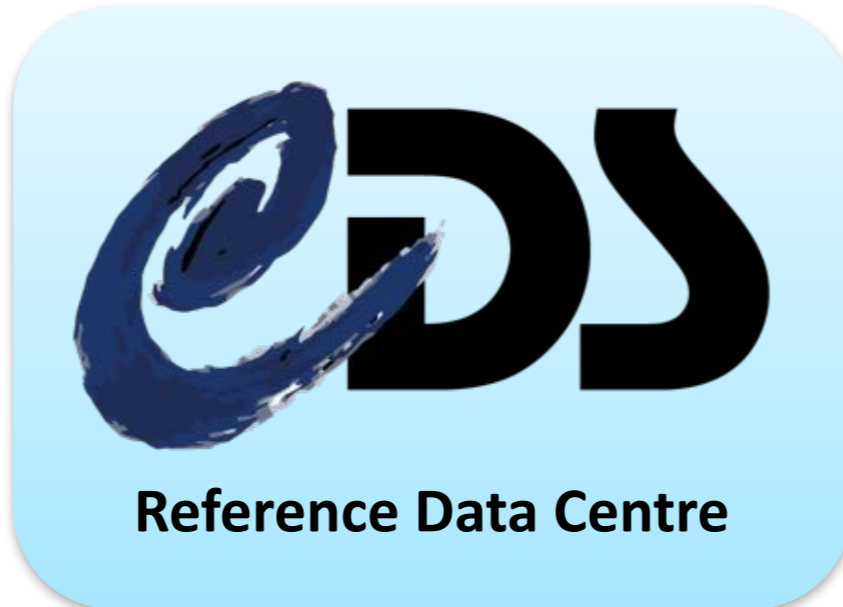
# CDS – a part of the global astronomy infrastructure



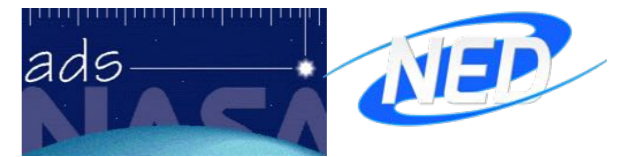
Ground and Space Observatories, Instruments and missions



Archives, Services



## Astronomy Data Centres



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

## Virtual Observatory



20 members

## Data e-Infrastructures





Service integration and portal

Sesame  
MOC Server



### Objects

Dictionary  
Bibliography  
Name resolver  
TAP



### Catalogues

Photometry service  
Associated data service  
FTP  
TAP



### Sky Atlas

Data integration  
Surveys  
HiPS/MOC

+ Aladin Lite Embeddable widget

### X-Match

Catalogue  
Cross-matching  
service

## Scientific content curation

Processing of  
published literature  
and reference data

Acronyms  
Identifiers  
Citations  
Basic Data

Cross-identifications  
Catalogues/Tables  
Associated data  
(images, cubes, time  
series, spectra +)  
All-sky surveys, HiPS  
Models/Simulations

VizieR and SIMBAD data  
ingestion pipelines  
Tools: DJIN, COSIM



## Development

R&D to support  
development,  
update and  
maintenance of CDS  
science services

Innovations in  
astronomical data  
techniques

Astronomy Informatics

R&D 'watch'

### R&D programs

New tech testing  
Training

Technical infrastructure operations  
and maintenance

Servers  
Storage  
Security  
Mirrors

Science  
user support

Projects

Virtual  
Observatory

Astro. community  
engagement

Journals / Agencies /  
Observatories / Data Centres

Coordination with  
Science Data  
Infrastructures

# □ Evaluations and Status

- **HCERES**
- 5 year evaluation
- Jan 30-31, 2017



*“CDS has an outstanding activity in terms of services and R&D on data mining, data-matching and capability to set international standards in this field.”*

# □ Evaluations and Status

## Update of the roadmap 2018

### Questionnaire:

- European & International dimensions
- Scientific and Technological concept
- “Data” and “Data Management”
- Scientific production and service use
- Relationships to other infrastructures
- Industrial relations, innovation and societal impact

## Complete Costs exercise

- A big job to assess all costs...
- CDS 2.8 M€ : 1.95 M€ personnel, ~750 k€ functioning (incl. indirect costs), material costs ~100 k€





# □ Highlight: LISA

- **LISA conference hosted by CDS**

- June 6-9, 2017
- International conference held each 3 or 4 years
- “Scientific meeting for librarians and scientists...”
- 110 participants
- Facilitated interactions between major astronomy information providers
- CDS presentations (6)
  - Documentalists
  - Software Engineers
  - Scientists
- Papers: record of CDS procedures



## Local Organizing Committee

**CDS** - Centre de Données astronomiques de Strasbourg- France

- Solzick Lesteven (CDS) , chair
- Caroline Bot (CDS)
- Laurent Cambrésy (CDS)
- Céline Halter (CDS)
- Gilles Landais (CDS)
- Evelyne Son (CDS)
- Fabienne Woelfel (CDS)

# LISA VIII

- Home
- Program
- Venue and Travel
- Participants
- Social Events
- Submission Instructions
- Register
- Contact
- Sponsors
- Instructions for authors

## 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

→ LISA VIII photos

[Instructions for authors](#)

Follow Lisa on twitter  
#lisa8



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.

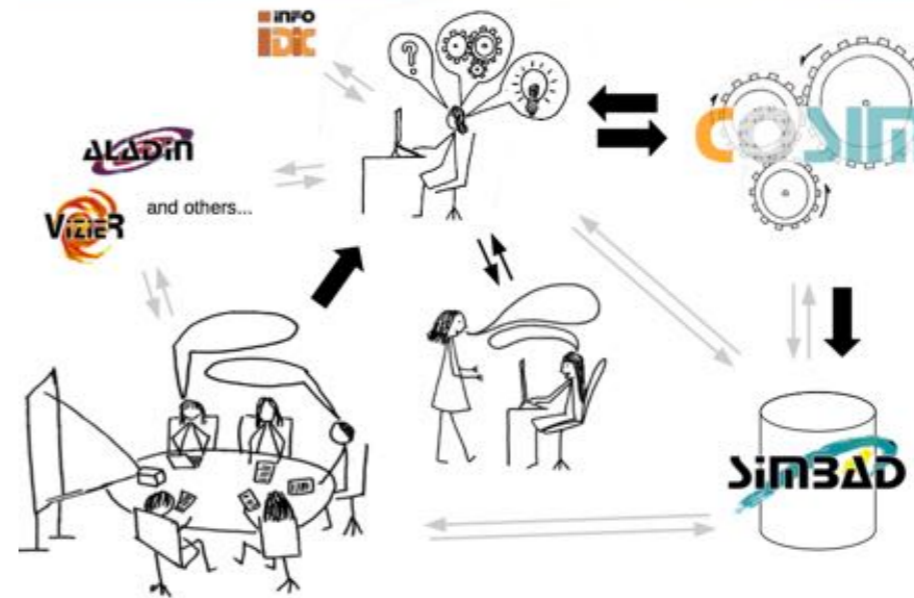


The June 2017 LISA meeting will be hosted by the *Observatoire astronomique de Strasbourg*, in Strasbourg, France. The meeting will take place at the Collège Doctoral Européen on the campus of the University of Strasbourg near the observatory.

# Highlight: LISA



## □ COSIM : global procedure



# □ Highlight: CDS Portal released

- mid-Dec 2016
- A single entry point to CDS services
- Integrates HiPS, Aladin Lite, MOCServer
- User-feedback phase now

The screenshot shows the CDS Portal interface for the object NGC 1365. At the top, there are navigation tabs for 'Portal', 'Simbad', 'Voilà', 'Aladin', 'X-Match', and 'Other'. Below the navigation, the object name 'NGC 1365' is displayed with a search icon and a 'position' field. The main content area is divided into several sections: 'Object (Simbad)' and 'Object (NED)' provide basic information like 'Main ID', 'Object type', and 'Morphological type'. Below this, there are sections for 'Images' and 'Aladin Lite'. The 'Images' section shows a list of 192 HPS images available, with filters for wavelength (Gamma-ray, X-ray, UV, Optical, Infrared, Radio) and resolution (Low, Medium, High). A table lists various image surveys and their sky fractions. The 'Aladin Lite' section shows a preview of the 'DSS colored' image of the galaxy. The interface is user-friendly and provides a comprehensive overview of the object's data and available images.

The screenshot shows the 'Catalogues' section of the CDS Portal. It displays a list of 475 VizieR Catalogs within a radius of 0.20 degrees. The list is sorted by popularity and includes various astronomical catalogs such as '2MASS All-Sky Catalog of Point Sources (Cutri+ 2003)', 'Gaia DR1 (Gaia Collaboration, 2016) (gaia)', 'The Tycho-2 Catalogue (Høg+ 2000) (tyc2)', and 'The USNO-B1.0 Catalog (Monet+ 2003)'. The interface includes filters for wavelength and popularity, and a sidebar with additional information like 'Mission', 'Associated data', and 'Journal'. The interface is clean and modern, with a dark sidebar on the left.

# Highlight CDS Content: **2016-2017**



Astronomical Objects :

*~9.3 million objects, ~27 million ID, 16 million citation links  
+0.8 million objects, +3.2 million IDs, +2.1 million cite.*

***Gaia in SIMBAD - improvement of astrometry for 2 million stars***



Catalogue Service :

*16528 Catalogues, 32991 published tables, 19.2 billion rows, millions of associated data: spectra, time series, images*



Visualisation and integration :

*380+ HiPS surveys: images (137 TB)*

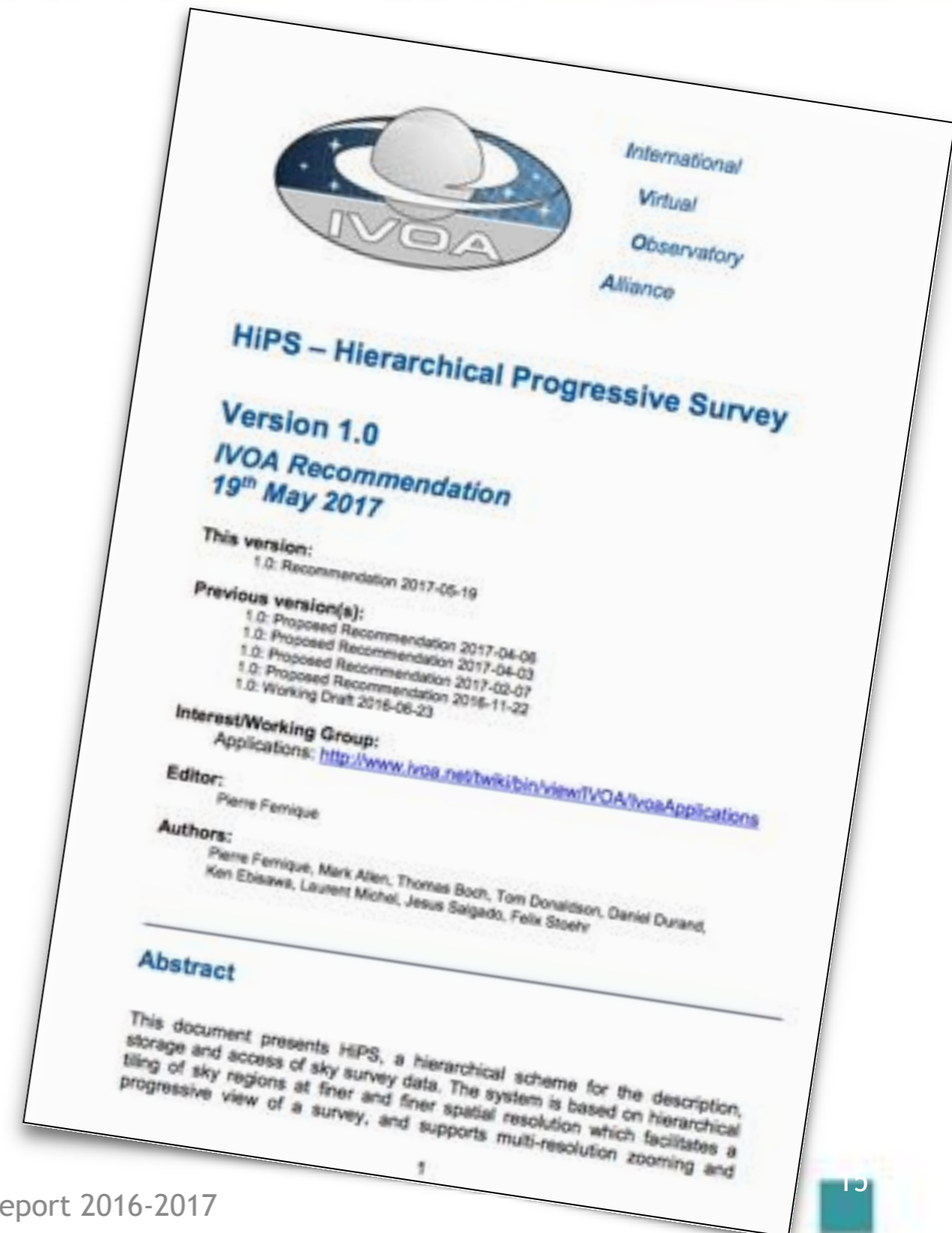
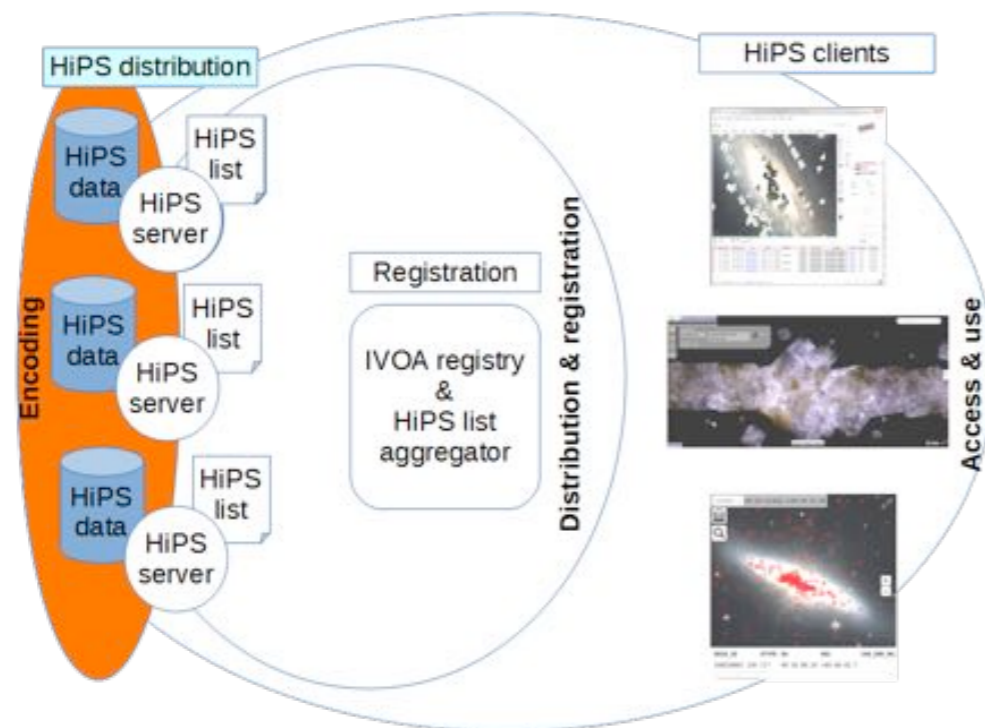
***+10% HiPS, +37% by volume***

***DECam Legacy survey, MaNGA cubes, HI4PI, ATLASGAL,...  
Pan-STARRS and SkyMAPPER being processed***



# □ Highlight: HiPS standardisation

- IVOA Recommendation
- CDS Editor: P. Fernique
- 3 CDS authors plus STScI/MAST, CADAC, JAXA, ObAS, ESA, ESO/ALMA



# □ Highlight: ASTERICS & RDA

- **ASTERICS successful mid-term review**
  - H2020 cluster project, 2015-2019, ~20 partners, 15 M€
  - CDS leads Data Access, Discovery & Interoperability (DADI) WP4
  - “...exceptional results with significant immediate or potential impact”
- **Research Data Alliance (RDA)**
  - Next project RDA Europe 4.0 selected and Grant Agreement expected in Nov 2017 for a start date in February 2018



# □ Highlight: Scientific Training Events

- **The GAVO-CDS Gaia Data Access Workshop**, Heidelberg 21-24 November, 2016
- **The ASTERICS DADI VO School**, Strasbourg, 15-17 November, 2016
- **Doctoral school in Paris**, 31 January, 2017
- The “**Detecting the Unexpected - discovery in the Era of Astronomically Big Data**” workshop, Baltimore, 27 February - 3 March, 2017. Tutorial: “*Advanced use of HiPS and MOC*”
- **3rd Cosmology School** in Cracow, Poland, 10-23 July 2017
- **Cosmology School** in the Canary Islands, 18-22 September 2017
- Observatoire Côte d’Azur Session Observatoire Virtuel, Nice, 26-27 September 2017

## 2016 - 2017

- **User feedback**
- **Breaking into new audiences**
- **Re-usable training materials**





# □ Highlight: Collaborations and Interactions with partners and astronomy community

- ADASS 2016 - 5 oral presentations
- Visits: STScI/MAST, HEASARC, ESAC, SAO/ADS
- *Booths:* EWASS, AAS, ADASS/IVOA
- LSST CNRS/IN2P3 meetings
- AAHEP9 - Publishers summit
- JDEV, VO-France, SF2A meetings
- ASTERICS events



# □ 2 extra highlights:

- Award of a ***Bourse L'Oréal-UNESCO Pour les Femmes et la Science*** - Jenny Sorce (CDS ASTERICS Postdoc) - Paris, tomorrow... 11 Oct 2017
- **Gravitational wave announcements: *we were there...***



### Featured news

#### Gravitational Waves - Aladin-Lite and Aladin visualisations

Event	Key Information	Labels	Filtering Info
GW170814 - LIGO-Virgo			
GW170814 - LIGO-Virgo			
GW170814 - LIGO-Virgo			
GW170814 - LIGO-Virgo			
GW170814 - LIGO-Virgo			
GW170814 - LIGO-Virgo			

**GW170814 visualised in Aladin Lite - September 28, 2017**

### Astronomy Picture of the Day


Discover the cosmos! Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer.

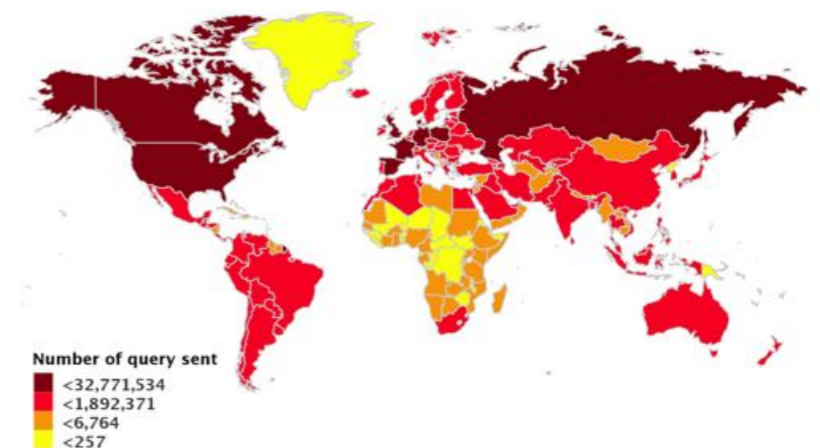
2017 September 28

Rapid LIGO localization

Rapid LIGO and Virgo localization

# □ CDS Service use

- **Textual citations identified by ADS** 
- In 2016, **660** refereed papers cited the word **SIMBAD**, **382** the word **VizieR**, and **92** the word **Aladin** (*similar to 2015*)
- **Usage Statistics** – (*detailed in the service presentations*)
  - **SIMBAD** ~552 000 queries/day (cf. ~510 000)
  - **VizieR** ~326 000 queries/day (cf. 380 000)
  - Cross-match 1254 jobs/day (cf. 919)
  - **Aladin** + 8% actions/day, hosts +30%



Details in the presentations...

# □ Virtual Observatory and ASTERICS

## Responsibilities:

- Deputy Chair of the IVOA Executive Committee - *M. Allen*
- Chair of the Applications Working Group - *P. Fernique*
- Chair of the Data Access Layer (DAL) Working Group - *F. Bonnarel*
- Chair of the Semantics Working Group - *M. Louys*
- Chair of the Data Curation & Preservation Interest Group - *F. Genova*
- Chair of the Time Domain Interest Group - *A. Nebot*



## Priority areas:

- **Multi-dimensional data** - 1st set of standards now done! Major milestone guided by DAL WG Chair, F. Bonnarel
- **Time Domain** - now a major focus of activity, A. Nebot has taken on the responsibility as chair of the Time Domain Interest Group
- Big contributions to: Provenance data model, ObsCore data model, +



- RDA 8th Plenary meeting during the International Data Week, Denver, Colorado, 11-17 September 2016
- ADASS XXVI Conference, Trieste, Italy, 16-20 October 2016
- IVOA Interoperability Meeting, Trieste, Italy, 21-23 October 2016
- **ASTERICS DADI Virtual Observatory School, Strasbourg, 15-17 November 2016**
- **ASTERICS DADI-LOFAR meeting, Strasbourg, 18 November 2016**
- **DADI Provenance Day, Strasbourg, 13 December 2016**
- **ASTERICS DADI Technology Forum 3, Strasbourg, 22-23 March 2017**
- RDA 9th Plenary meeting, Barcelona, Spain, 5-7 April 2017
- IVOA Interoperability meeting, Shanghai, China, 14-19 May 2017
- RDA 10th Plenary meeting, Montreal, Canada, 19-21 September 2017

# □ Status of 2016 Recommendations of the CDS Scientific Council

- The recommendations have all been analysed and responses provided in the report
- It is very helpful to have high level recommendations for guidance

## **1. Astronomy Research - balance between service, research, teaching**

- CDS Science Team presentation (Wednesday 9h)



## 2. Staffing recommendation

- System manager priority has been addressed
- Documentalist and Software Engineer priorities remain
- CDS Scientific staff support is equally important, and must not fall below the current level. Critical need on 2019-2020 timescale.

## 3. Major Journals

- MNRAS update: discussed with Editor-in-Chief last week, opened discussion on a formal relationship with CDS



## 4. Solar System Objects

- A detailed response provided in the report
  - CDS mandate is for objects outside solar system
  - Approach based on interoperability with relevant data providers (national and international)
  - CDS does have significant catalogues of solar system objects, and role in enabling use of these data via IMCCE SkyBoT
  - CDS participates in the Europlanet/VESPA project
- See the Aladin presentation





## 5. **Data Ingestion** - alternative approaches including considerations of machine learning and other information technology improvements

- see the R&D presentation (9h20 Wednesday)
- The R&D program constantly tests new technologies in relation to our core and future activities
- e.g. DJIN2 uses GROBID a machine learning library