

SIMBAD



Soizick Lesteven : organization - bibliography

Cécile Loup : scientific content

Anaïs Oberto : softwares



CENTRE DE DONNÉES
ASTRONOMIQUES DE STRASBOURG



References

Year, journal, volume, pages,
title, authors, abstract, keyword,
bibcode, copyright, DOI

From publishers to SIMBAD

Soizick Lesteven

Magali Neuville (ApJ, ApJS)



Dictionary of Nomenclature

Dictionary update
(analysis, creation and update
of acronyms)
Update links to NED database

Marianne Brouty

Fabienne Woelfel

HiPS

Aladin update
Creation and description
of HiPS

Mihaela Buga



SIMBAD update

Extraction of information from articles

Objects, identifiers, fundamental data,
References, measurements, ...

Aline Eisele : A&A, PASJ, PASP, ...
Magali Neuville : ApJ, ApJS, Sci, Natur, ...
Evelyne Son : AJ, MNRAS
Philippe Vonflie : MNRAS



VizieR update

Standardization and
description of tables.
VizieR update

Marianne Brouty : ApJ
Sylvain Guéhéneux : AJ, ApJ
Emmanuelle Perret : ApJS, ApJ
Tiphaine Pouvreau : ApJ
Patricia Vannier : A&A, MNRAS



Tables



=g=

SIMBAD update

Via electronic tables
(selections, extractions, scripts,
cross-identifications)

Catherine Brunet

Mihaela Buga

Emmanuelle Perret (=v=)

Fabienne Woelfel



Scientific Expertise

SIMBAD : **C. Loup**, C. Bot, L. Cambrésy, A. Nebot, P. Ocvirk, A. Siebert, B. Vollmer

Dictionary : **B. Vollmer**

VizieR : **P. Ocvirk**, C. Bot, S. Derrière

IT Development

SIMBAD : **A. Oberto**, S. Lesteven, **T. Delacour**, **V. Kaestle**

Dictionary : **A. Oberto**

VizieR : **G. Landais**, T. Boch, F.-X. Pineau

Aladin : **P. Fernique**, T. Boch

Bibliographical Team

Soizick Lesteven / Cécile Loup / Anaïs Oberto

2017

edp sciences

OXFORD
UNIVERSITY PRESS

IOP
PUBLISHING

References

Year, journal, volume, pages,
title, authors, abstract, keyword,
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From publishers to SIMBAD

Soizick Lesteven

Magali Neuville (ApJ, ApJS)

INFO
IDIC

Dictionary of Nomenclature

Dictionary update
(analysis, creation and update
of acronyms)

Update links to NED database

400 acronyms / year

Marianne Brouty

Fabienne Woelfel

1,5 full time

HiPS

Aladin update
Creation and description
of HiPS

Mihaela Buga 15 HIPS / year

0,1 full time



SIMBAD update

Extraction of information from articles

Objects, identifiers, fundamental data,
References, measurements, ...

12,000 references / year

Aline Eisele : A&A, PASJ, PASP, ...

Magali Neuville : ApJ, ApJS, Sci, Natur, ...

Evelyne Son : AJ, MNRAS

Philippe Vonflie : MNRAS

3,5 full time



VizieR update

Standardization and
description of tables.

VizieR update

1,000 references
with tables / year

Marianne Brouty : ApJ

Sylvain Guéhénneux : AJ, ApJ

Emmanuelle Perret: ApJS, ApJ

Tiphaine Pouvreau : ApJ

Patricia Vannier: A&A, MNRAS

4 full time



Tables



=g=

SIMBAD update

Via electronic tables
(selections, extractions, scripts,
cross-identifications)

500 references with
tables / year

Catherine Brunet

Mihaela Buga

Emmanuelle Perret (=v=)

Fabienne Woelfel

2.6 full time



Scientific Expertise

SIMBAD : C. Loup, C. Bot, L. Cambrésy, A. Nebot, P. Ocvirk, A. Siebert, B. Vollmer

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IT Development

SIMBAD : A. Oberto, S. Lesteven, T. Delacour, V. Kaestle

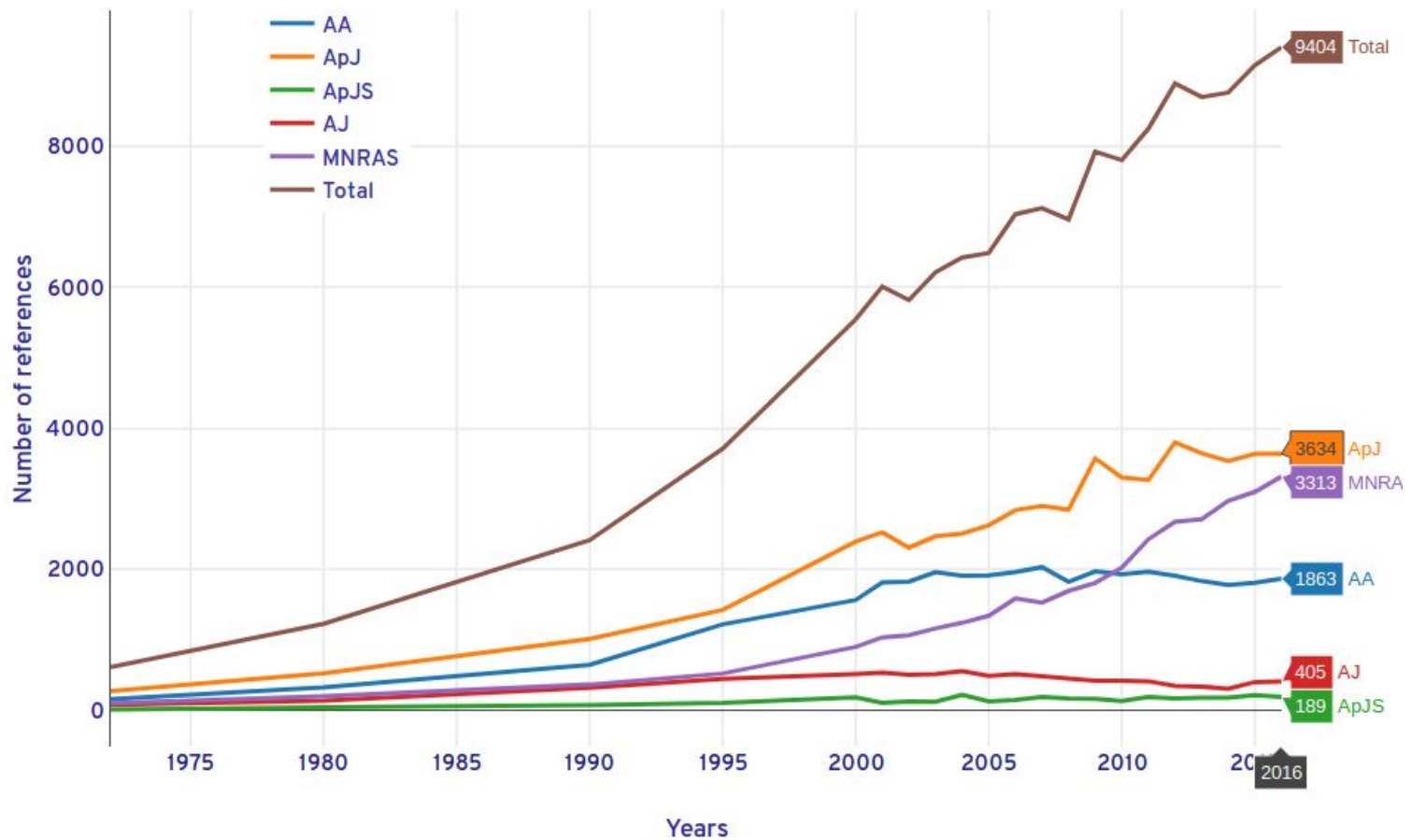
Dictionary : A. Oberto

VizieR : G. Landais, T. Boch, F.-X. Pineau

Aladin : P. Fernique, T. Boch

□ Main journals : Number of references

Number of references by journal and by year



□ Main objectifs : the quality of the services

- The organization evolves according to the amount of data to be processed, to the needs, to the evolution of the service.
- We reinforce the team to catch up the backlog but also to duplicate the expertises :
 - Re-distribution, Recruitment (new contractors)
 - Reinforce the synergy inside the team (meetings, trainings, ...)
- We work on the evolution and improvements of the tools
 - Renewal of bibliographic data processing
 - DJIN2

Bibliographical Team

Soizick Lesteven / Cécile Loup/Anaïs Oberto

2017

edp sciences

OXFORD
UNIVERSITY PRESS

IOP
PUBLISHING

References

Year, journal, volume, pages,
title, authors, abstract, keyword,
bibcode, copyright, DOI

From publishers to SIMBAD

Soizick Lesteven

Magali Neuville (ApJ, ApJS)

INFO
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Dictionary of Nomenclature

Dictionary update
(analysis, creation and update
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Update links to NED database

Marianne Brouty

Fabienne Woelfel

HiPS

Aladin update
Creation and description
of HiPS

Mihaela Buga

ALADIN

DJIN

SIMBAD update

Extraction of information from articles

Objects, identifiers, fundamental data,
measurements, references,

Aline Eisele : A&A, PASJ, PASP, ...

Magali Neuville : ApJ, ApJS, Sci, Natur, ...

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SIMBAD

Tables

VizieR

Standardization and
description of tables.
VizieR update

Marianne Brouty : ApJ

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Emmanuelle Perret : ApJS, ApJ

Tiphaine Pouvreau : ApJ

Patricia Vannier : A&A, MNRAS, ...

VIZIER

COSMOS

=g=

SIMBAD update

Via electronic tables
(selections, extractions, scripts,
cross-identifications)

Catherine Brunet

Mihaela Buga

Emmanuelle Perret (=v=)

Fabienne Woelfel

Esther Collas

SIMBAD

Scientific Expertise

SIMBAD : **C. Loup**, C. Bot , L. Cambrésy, A. Nebot, P. Ocvirk, (A. Siebert), B. Vollmer

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Aladin : **P. Fernique**, T. Boch

□ Improvement of the complete process for the ingestion of the bibliography

- Renewal of bibliographic data processing:
 - Extraction of bibliographical data collected from the publishers in different format to a unique one.
 - Improvement of the different tests to assure the consistency of these data for SIMBAD
- Migration of the all the bibliographical data from the bibliographical server to SIMBAD to avoid the duplic
- Control the data consistency on a daily basis
- Thomas Delacour (software developer - contractor)

Journals Metadata

Articles from ApJ, AJ, ApJS, A&A and MNRAS in XML format

IOPscience

EDP sciences

OXFORD UNIVERSITY PRESS

Other journals (IBVS, GCN, AstBu...)
Multiple format (parfiles, emails, ascii, ...)

Extraction of small tables for Vizier



Extraction of information (journal, volume, pages, DOI, copyright, authors, affiliations, titles, abstracts, keywords astronomical objects ...),
Bibcode creation
The data are stored in parfile format files

References controls

Compare the authors with those in Simbad

Compare the keywords with a reference list

Control of volume completion

Objects controls

Object tagged by the authors

Object inside keywords

```
%R 2017A&A...600A..57C
%F A+A.ori/m2017-041/v600/aa29522-16.xml
%J-57
%M 15
%DOI 10.1051/0004-6361/201629522
% (copyright) ESO, 2017
%A Chiaberge, M.
%A Ely, J.C.
%A Meyer, E.T.
```

```
%K galaxies: active
%K quasars: individual 3C 186
%K gravitational waves
```

Data integration



After corrections, tests are performed again until the parfile is correct

Verification of the objects in Simbad.
Add a link when the object is in a title, a keyword or an abstract

Daily and/or weekly automated checks to ensure quality and reliability of Simbad

Controls of new references, authors and objects

Follow-up on status, comments and notes

Integrated data in Simbad are then used in DjIn

2017A&A...600A..57C

The protizing case of the radio-loud QSO 3C 186: a gravitational wave recycling black hole in a young radio source?

Abstract (Short): Compact, flat-panel active galactic nuclei with powerful radio emission are thought to be associated with centrally spinning black holes (BHs). BH spin-up may result from a number of processes, including accretion of matter onto the BH itself, and electromagnetic torques such as Blandford-Znajek (BZ) torque. This object shows peculiar features such as the presence of a radio-loud QSO (RLQ) and a powerful radio jet. The radio emission is highly variable, and the jet is highly collimated. The radio emission is highly variable, and the jet is highly collimated. The radio emission is highly variable, and the jet is highly collimated.



□ DJIN2 : a major update (in progress)

- DJIN1 begins to be obsolete
 - PDF extraction
 - Greek letters, ...
- DJIN2 :
 - GROBID : machine learning library for extracting, parsing and re-structuring PDF documents into structured TEI (Text Encoding Initiative) documents.
 - The astronomical object names recognition is based on text mining.
- Vincent Kaestle (software developer - contractor)



- MENTIONS
- > ? Alpha Centauri (1)
 - > ? α Centauri A (3)
 - > ? B (13)
 - > ? α Centauri (2)
 - > ? WDS J14396-6050AB (1)
 - > ? GJ559AB (1)
 - > ? A (5)
 - > ? Proxima (1)
 - > ? Cen A (2)
 - > ? HD 128621 (1)
 - > ? α Cen A (30)
 - > ? HD 123999 (18)
 - > ? HD 123999 119126 (1)
 - > ? A0-B2-C1-D0 (1)
 - > ? D0-K0-G2-J3 (1)
 - > ? A0-J2-G1-J3 (1)
 - > ? A0-G2-D0-J3 (1)
 - > ? HR 5304 (1)
 - > ? HD 78418 (1)
 - > ? α Cen (1)
 - > ? α Cen B (4)
 - > ? Cen B (1)
 - > ? Arcturus (1)

A&A 597, A137 (2017)
DOI: 10.1051/0004-6361/201629505
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The radii and limb darkenings of α Centauri A and B Interferometric measurements with VLTI/PIONIER*

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- ³ Université Côte d'Azur, Observatoire de la Côte d'Azur, CNRS, Lagrange UMR 7293, CS 34229, 06304 Nice Cedex 4, France
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Received 8 August 2016 / Accepted 11 October 2016

ABSTRACT

The photospheric radius is one of the fundamental parameters governing the radiative equilibrium of a star. We report new observations of the nearest solar-type stars α Centauri A (G2V) and B (K1V) with the VLTI/PIONIER optical interferometer. The combination of four configurations of the VLTI enable us to measure simultaneously the limb darkened angular diameter θ_{LD} and the limb darkening parameters of the two solar-type stars in the near-infrared H band ($\lambda = 1.65 \mu\text{m}$). We obtain photospheric angular diameters of $\theta_{LD}(A) = 8.502 \pm 0.038 \text{ mas}$ (0.43%) and $\theta_{LD}(B) = 5.999 \pm 0.025 \text{ mas}$ (0.42%), through the adjustment of a power law limb darkening model. We find H band power law exponents of $u(A) = 0.1404 \pm 0.0050$ (3.6%) and $u(B) = 0.1545 \pm 0.0044$ (2.8%), which closely bracket the observed solar value ($u_{\odot} = 0.15027$). Combined with the parallax $\pi = 747.17 \pm 0.61 \text{ mas}$ previously determined, we derive linear radii of $R_A = 1.2234 \pm 0.0053 R_{\odot}$ (0.43%) and $R_B = 0.8632 \pm 0.0037 R_{\odot}$ (0.43%). The power law exponents that we derive for the two stars indicate a significantly weaker limb darkening than predicted by both 1D and 3D stellar atmosphere models. As this discrepancy is also observed on the near-infrared limb darkening profile of the Sun, an improvement of the calibration of stellar atmosphere models is clearly needed. The reported PIONIER visibility measurements of α Cen A and B provide a robust basis to validate the future evolutions of these models.

Key words. stars: individual: Alpha Centauri – techniques: interferometric – stars: solar-type – stars: fundamental parameters – binaries: visual

1. Introduction

The photospheric radius of a star is intimately linked to its radiative equilibrium through the Stefan-Boltzmann law. Over the lifetime of a star, the radius and effective temperature are directly related to the production of nuclear energy at the core of the star. Measured radii and seismic oscillation frequencies provide complementary constraints for stellar structure and evolution models (Creevey et al. 2007; Cunha et al. 2007; Metcalfe et al. 2015). The triple system α Centauri (WDS J14396-6050AB, GJ559AB) is our closest stellar neighbor,

(Quarles & Lissauer 2016; Rajpaul et al. 2016; Demory et al. 2015; Worth & Sigurdsson 2016; Andrade-Ines & Michichenko 2014; Kaltenegger & Haghighipour 2013; Dumusque et al. 2012). In addition, the α Cen pair is one of the principal benchmark stars of the *Gaia* mission (Heiter et al. 2015; Jofré et al. 2015). An extremely accurate calibration of its fundamental parameters is essential for the validation of the data analysis methods that are currently applied to the fainter targets of the *Gaia* catalog (see e.g. Baier-Jones et al. 2013).

We report new optical interferometric measurements of

VALIDATED MENTIONS

- > ✓ * alf Cen A (1)
- > ✓ * d Boo (1)
- > ✓ HD 123999B (1)
- > ✓ α Cen A (1)

SELECTION DETAILS

Raw id
HD 128620

State
Validated

Position
t - Title

Simbad Identifier
HD 128620

Add command

* alf Cen A (SB*)

ra: 219.90205833170774

dec: -60.83399268831004

pmra: -3679.25

pmdec: 473.67

rvz_radvel: -21.4

plx_value: 754.81

Zoom 80%

□ Quality of the scientific content of SIMBAD

- Integrated team to share expertise :
 - documentalists + software engineers + astronomers
- Quality versus increasing volume of publications :
 - more efficiency with evolving softwares
 - astronomers available enough for scientific expertise
- DJIN documentalists : all the references, not so many astronomical objects → reference astronomer
- COSIM documentalists : 20 times less references, most astronomical objects → weekly meetings

□ Prioritization of lists of objects

- SIMBAD should be devoted to objects “**of interest**”
- SIMBAD and VizieR are complementary
- Approved by the Scientific Council in 2012

→ Appraisal procedure :

Weekly meetings (2x1h) to go through articles with tables

Involves documentalists and astronomers

→ Detailed instructions for ingestion in SIMBAD

→ Astronomers available when scientific expertise needed

□ Scientific and technical criteria

- High priority : 50 - 70%

Spectroscopy, characterization, cross-identifications, memberships, rare objects, very high rate of citations

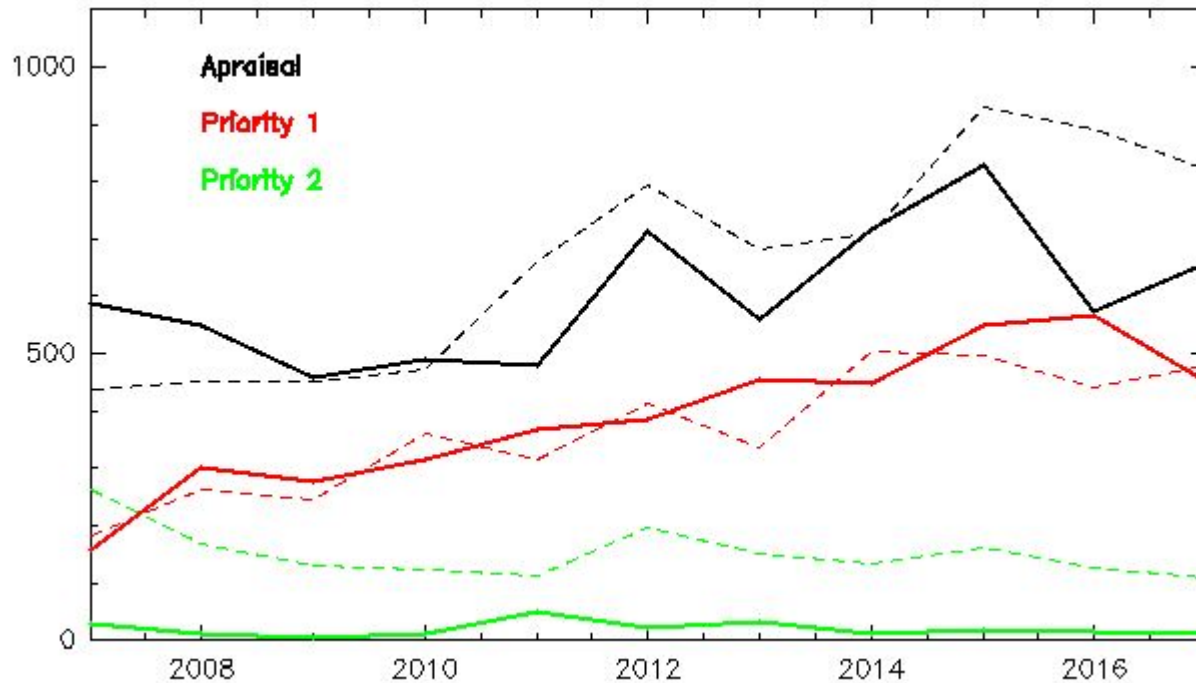
- Low priority : 15 - 30%

Nature unclear, poor coordinates, incorrect or truncated names

- Not processed : 10 - 20%

No coordinates at all, uncharacterized in crowded regions, very large photometric surveys (→ VizieR)

□ Tables workflow



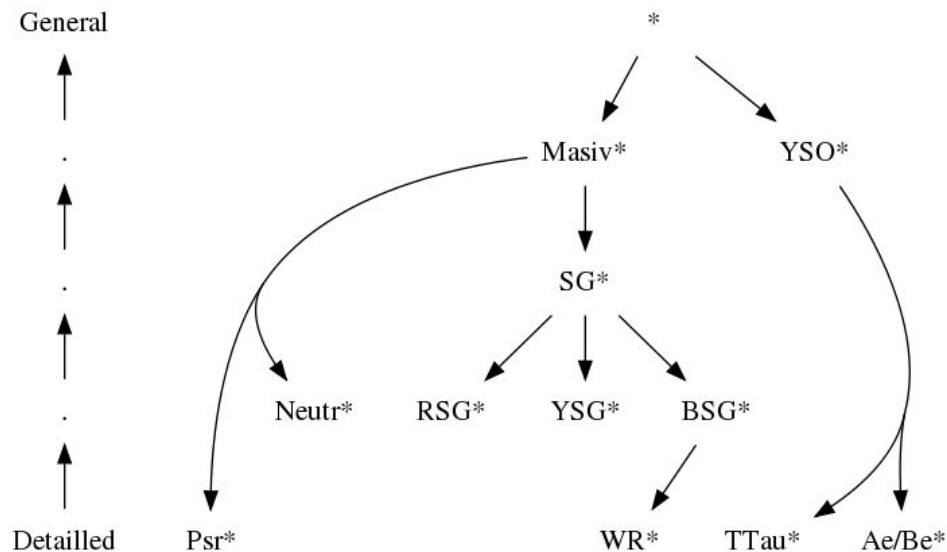
Regulation of the number of priority 1 by the number of weekly meetings

□ Improving content : special operations

- Ingestion of GAIA-TGAS DR1 : ~2,000,000 stars
 - Some unexpected complications as HIP double stars resolved in Tycho were not properly identified in the TGAS
- Ingestion of the last version of LEDA :
 - about 500,000 new galaxies in SIMBAD
- New objects types
 - Gravitational Wave Event : 3 cases
 - Hot subdwarfs : 3600 (including historical ones) versus 35000 white dwarfs

□ Continued effort to renew the object type hierarchy

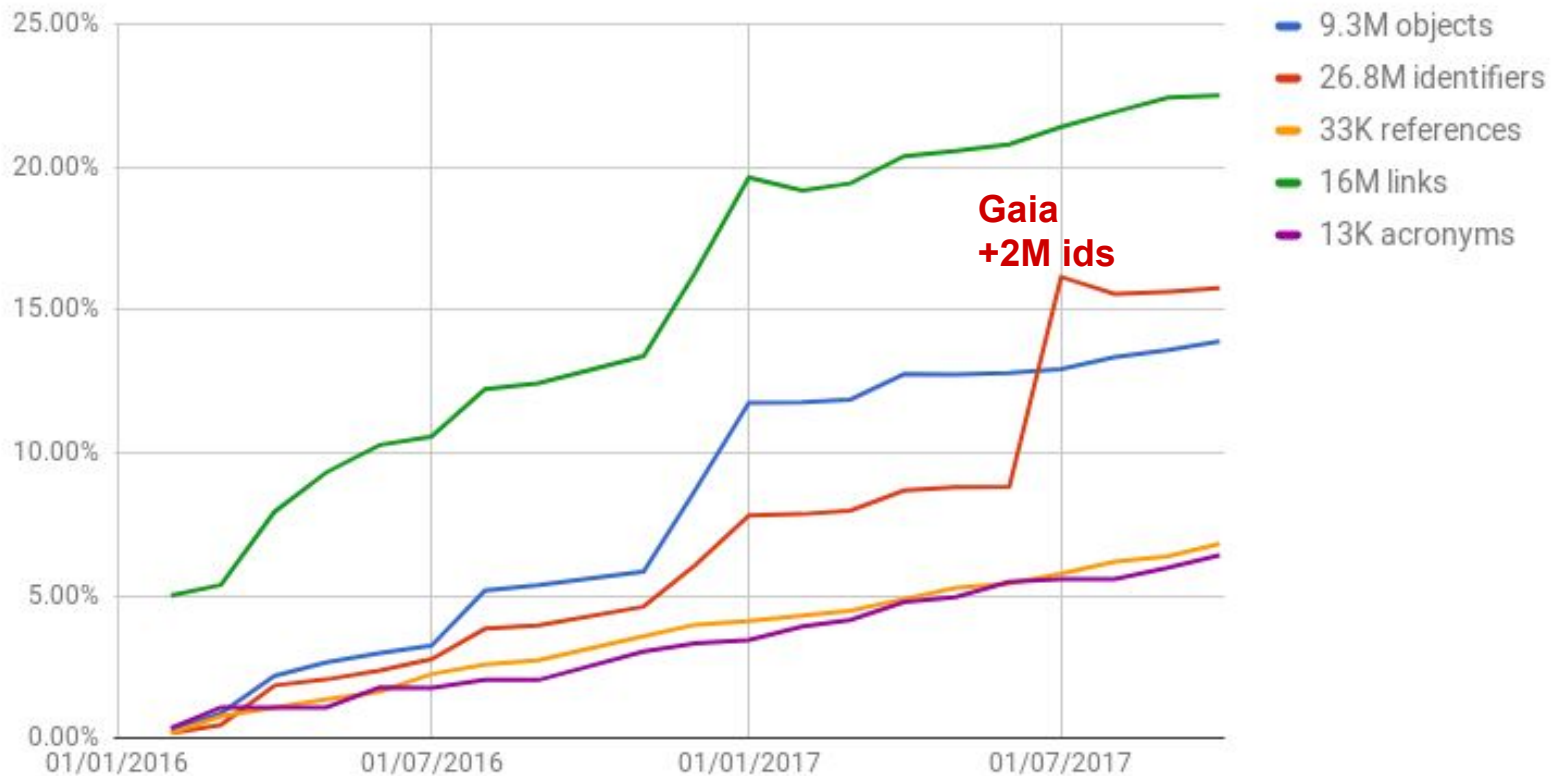
- Improvement of internal software
- Scientifically driven evolution of object type hierarchy
- The hierarchy is actually part of the software, allowing documentation to be automatically generated



□ SIMBAD Content

2017/10 : 9 323 552 objects

Cumulative growth of content



□ Evolutions of the data formats

- Old measurements have been deleted
 - Replaced by a direct link to VizieR
- Increased precision to accommodate Gaia data
- More direct links between SIMBAD and the tabular data in VizieR

□ Servers infrastructure evolution (in progress)

- Studies and improvements of Simbad servers:
 - New mirrors installation (usage of generic dockers)
 - R&D on duplication for internal and external use
 - Plans for the next SIMBAD generation
- Web Simbad evolution:
 - What are the habits to maintain ?
 - What we should focus on ?
 - How to satisfy all types of usage ?

□ In development

- New DJIN2
- Tool for suggestion of correct SIMBAD object name (used by A&A)
- Planning for new architecture

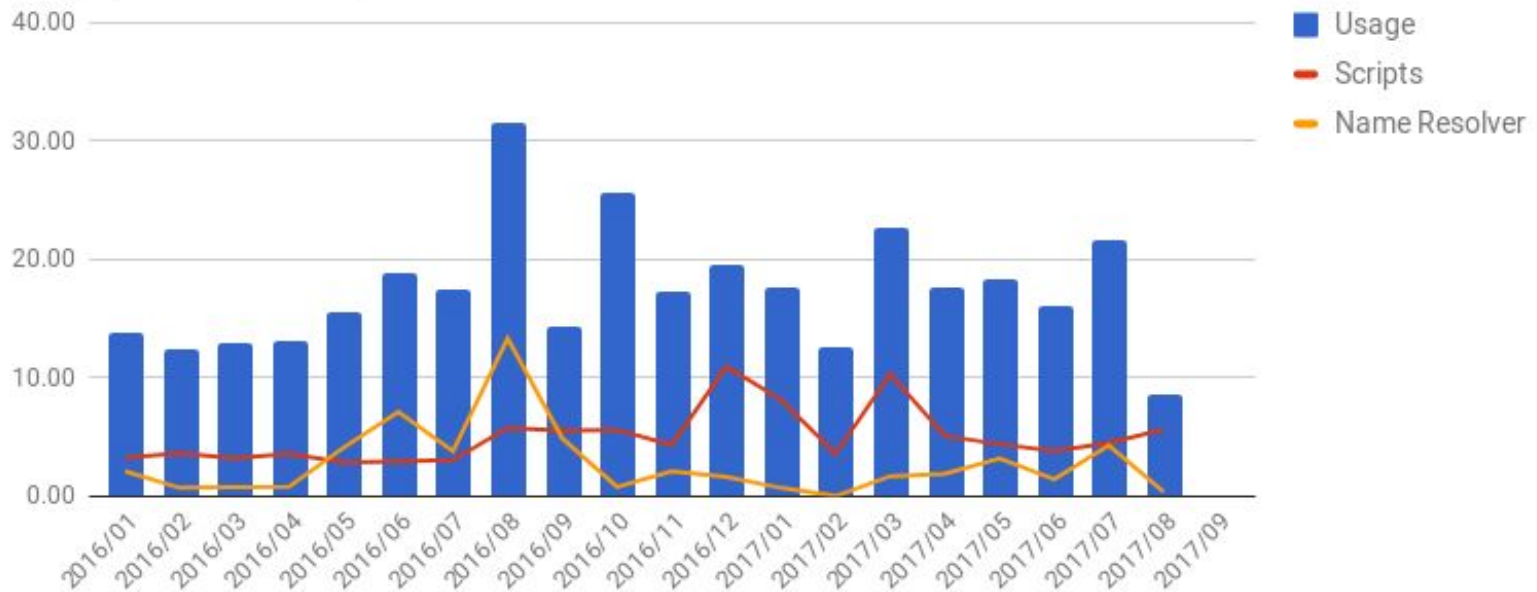
Future development :

- New dictionary software and architecture

□ SIMBAD Usage 2016-2017

~ 552 000 / day

Usage (millions / month)



□ SIMBAD Usage 2016-2017

Lots of “programmatic” usage

Type of usage in 2017

