

International collaborations, surveys, infrastructure development and use

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Uppsala University
EXOHOST, 7 November 2024

Why?

Design, execute and use large amounts of data to fulfill a specific scientific purpose

Data access and dissemination policy

Pooling resources and effort for large projects

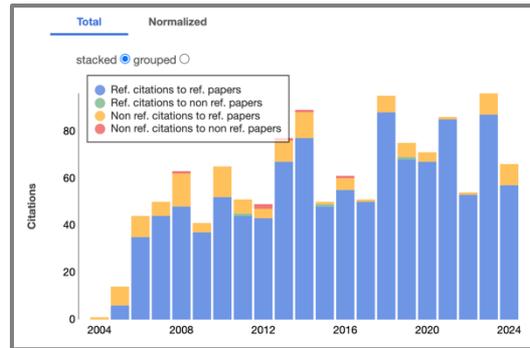
Benefits many people over a long period of time

International collaborations

- **Combine & coordinate resources**
 - telescope time
 - access to models
 - analysis methods
 - ideas & background knowledge
- **Networking at conferences**
 - talks/posters as opening to broader projects
 - offering contributions or resources
 - follow up, everyone is busy
- **Build to larger groups**

Using existing infrastructure

- Developing larger observing proposal to be executed over time.
- Compelling science, minimal funding.



A&A 428, 1027–1037 (2004)
 DOI: 10.1051/0004-6361:20041536
 © ESO 2004

**Astronomy
&
Astrophysics**

The Hamburg/ESO R-process Enhanced Star survey (HERES)*

I. Project description, and discovery of two stars with strong enhancements of neutron-capture elements

N. Christlieb^{1,3}, T. C. Beers², P. S. Barklem³, M. Bessell⁴, V. Hill⁵, J. Holmberg^{6,7}, A. J. Korn^{3,8}, B. Marsteller², L. Mashonkina^{9,8}, Y.-Z. Qian¹⁰, S. Rossi¹¹, G. J. Wasserburg¹², F.-J. Zickgraf¹, K.-L. Kratz^{13,14}, B. Nordström^{6,15}, B. Pfeiffer^{13,14}, J. Rhee^{16,17}, and S. G. Ryan¹⁸

A&A 439, 129–151 (2005)
 DOI: 10.1051/0004-6361:20052967
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**Astronomy
&
Astrophysics**

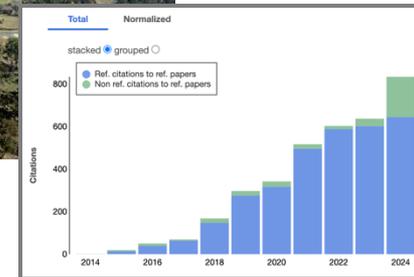
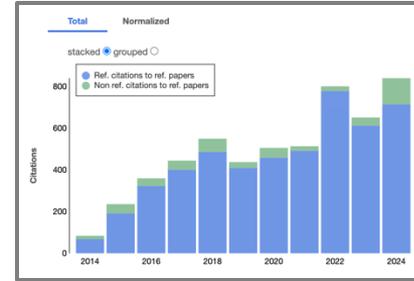
The Hamburg/ESO R-process enhanced star survey (HERES)*,***

II. Spectroscopic analysis of the survey sample

P. S. Barklem¹, N. Christlieb², T. C. Beers³, V. Hill⁴, M. S. Bessell⁵, J. Holmberg^{6,7,8}, B. Marsteller³, S. Rossi⁹, F.-J. Zickgraf², and D. Reimers²

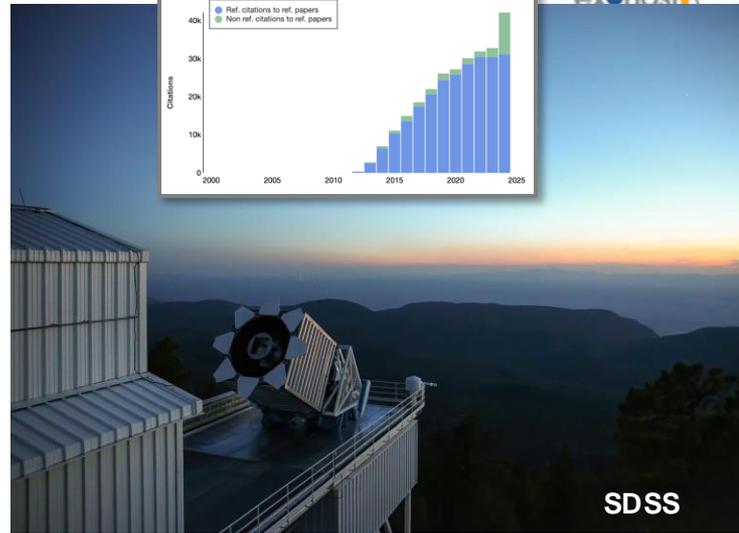
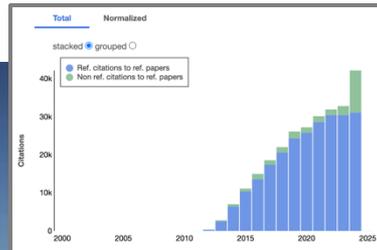
Using existing infrastructure

- Developing larger observing proposal to be executed over time.
- Compelling science, minimal funding.
Individual commitment
Facility commitment
- Gaia-ESO Survey – new + archival data
- GALAH – ongoing observations, proposal renewals must be justified.

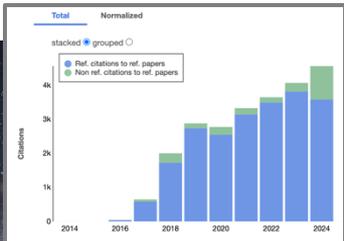


Infrastructure development

- Design a dedicated facility
- Built new facility – SDSS, LSST, **Gaia**
- Re-purpose existing facility or site – **4MOST**, WEAVE, MSE
- Requires significant funding



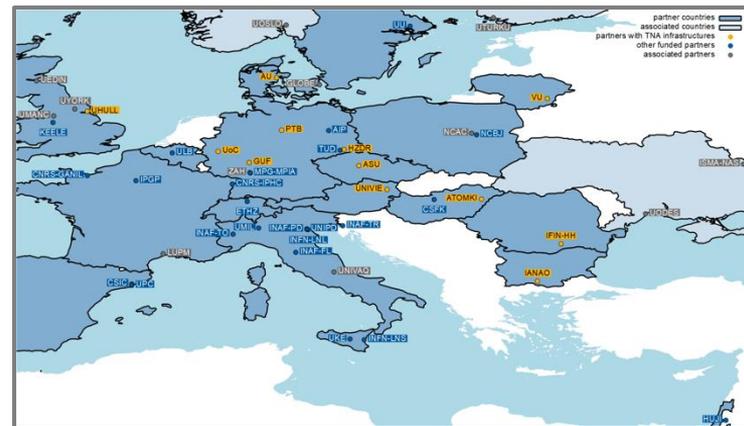
Gaia



Infrastructure development



- Chemical Elements as Tracers of the Evolution of the Cosmos - Infrastructure
- Provides scientists access to infrastructures across countries
- Application process
- Specific science goal that requires multiple infrastructures



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008324 (ChETEC-INFRA).



Funding

- Funding/support organizations
- Member institutions
- Individual members
- Money vs contributions/effort
 - hardware, software, individual FTEs, ideas, leadership



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FOUNDATION

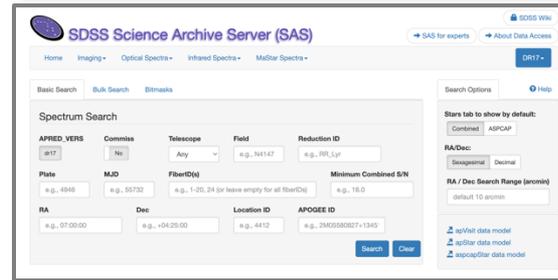
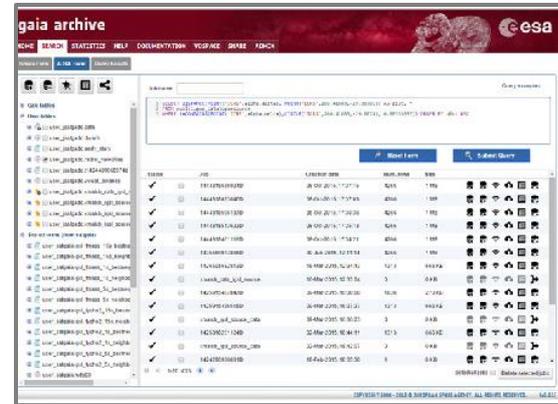


*Knut and Alice
Wallenberg
Foundation*



Data dissemination and storage

- Proprietary period?
 - SDSS vs Gaia
- Eventually public?
 - May depend on funding agencies
- Periodic data release
 - Promote science output
- Legacy archives
 - Major, long-term infrastructure
- External collaborators
 - Ensure core science is achieved



- ☆ Data Release 17
- ☆ Data Release 16
- ☆ Data Release 15
- ☆ Data Release 14
- ☆ Data Release 13
- ☆ Data Releases 11 and 12
- ☆ Data Release 10
- ☆ Data Release 9
- ☆ Data Release 8
 - ★ Erratum
- ☆ Data Release 7
- ☆ Data Release 6
- ☆ Data Release 5
- ☆ Data Release 4
- ☆ Data Release 3
- ☆ Orion Data Release
- ☆ Data Release 2
- ☆ Data Release 1
- ☆ Early Data Release
 - ★ Erratum

Publication policies

- Who can publish using the data and on what topics?
 - protected science questions?
- Who can join a paper?
 - architect/builder status?
- Does the collaboration need to approve the publication/project?
 - announcement & waiting period?

The screenshot shows the 'Publications' section of the exohost website. At the top, there is a navigation menu with links: Home, Publications, Projects, VACs, Architects, External Collaborators, Plate Lists, Press Releases, Issues, and Accounts. Below this is a secondary menu: Browse Papers, Announce Paper, Papers Policy, Acknowledgement, Coauthor Requests, Coauthor Policy, and Publications Report.

The main area is titled 'Refine' and contains several search filters:

- Author:** A text input field, a dropdown for 'Select member author', and a 'Match any author' checkbox.
- Title:** A text input field and an **Abstract:** text input field.
- Project:** A dropdown menu labeled 'Select project'.
- Category:** A list of categories including 'Scientific Paper in Journal', 'Paper in Conference Proceeding', 'Meeting Abstract', 'Scientific Paper in Journal based on Public SDSS Data', 'Conference Proceeding based on Public SDSS Data', 'Technical Paper in Journal', 'Data Release Paper', 'Online Catalog', and 'Astronomer's Telegram (ATEL)'. A 'Status' dropdown is also present with options like 'Submitted to collaboration', 'Submitted to journal', 'Accepted by journal', 'Published in journal', and 'Posted to ATEL'.
- Survey:** A dropdown menu with options like 'SDSS-IV General', 'APOGEE-2', 'eBOSS', 'MaNGA', 'MaStar', 'SPIDERS', 'TDSS', 'SDSS-III General', 'APOGEE', 'BOSS', 'MARVELS', and 'SEGUE-2'.
- Comment:** A text input field.

 Below the filters are four dropdown menus: 'Select Release', 'Select Author Ordering', 'Select Analysis Type', and 'Select Announcement Source'.

At the bottom of the 'Refine' section, there are three boxes:

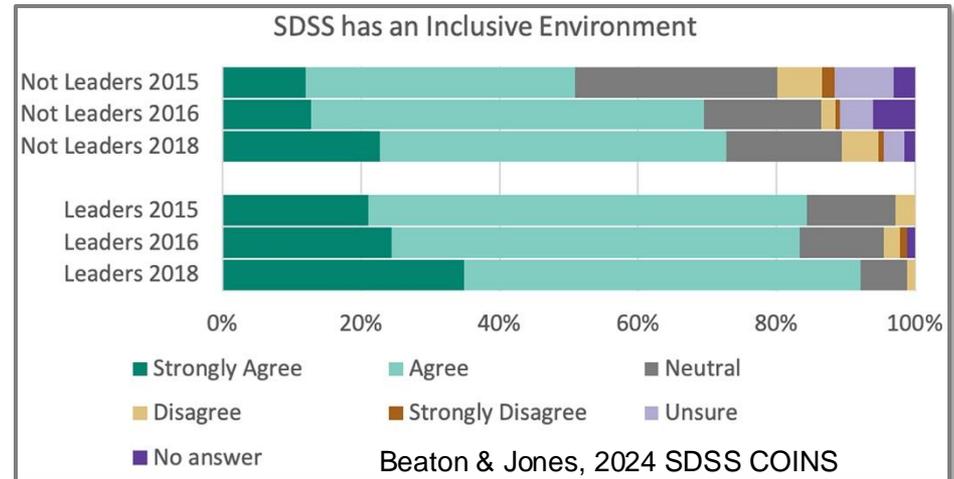
- Show:** Checkboxes for 'Authors', 'Survey', 'Paper URL', 'Project', 'Category', 'Status', 'Citation Info', and 'Deleted Papers'.
- Sort:** A dropdown menu for 'Identifier' and a 'Desc' checkbox.
- Action:** 'Search' and 'Clear' buttons.

At the very bottom of the interface, it states 'Matched 1112 publications' and 'Please select a paper by number for further options'.

Work environment



- Many people: different countries, backgrounds, career levels, cultures, science interests
- Ensuring a good working culture is not trivial
- Code of conduct
- Demographic and work environment surveys
- Ombudspersons
- Plan for disagreements



Using public data

● Documentation

SDSS Data Release Publications

With each data release, the Sloan Digital Sky Survey collaboration has published a Data Release paper, which describes the data, the data acquisition process, and other details of the project.

The most current public data release of the SDSS-IV is Data Release 17 (DR17), which was released in December 2021. Details of DR17 are described in the [Data Release 17 paper](#) (Abdurro'uf et al. 2022).

This page gives links to the published paper for each data release, which serves as the official academic record for that release. When publishing research with data from one or more of our data releases, please reference the appropriate paper from the list below, along with any [technical publications](#) necessary for the reader to understand how the data were collected. Please see our guide on [how to cite SDSS](#). Thank you, and we hope you find our data useful!

Data Release 17

Publicly Available: 6 December 2021

Abdurro'uf et al., The Seventeenth data release of the Sloan Digital Sky Surveys: Complete Release of MaNGA, MaStar and APOGEE-2 DATA (Abdurro'uf et al. 2022 [ApJS](#) 259, 35)

- ☆ ADS abstract: [2022ApJS...259...35A](#)
- ☆ Journal publication: [doi:10.3847/1538-4365/ac4414](#)
- ☆ arXiv preprint: [arXiv:2112.02026](#)

Data Release 16

Publicly Available: 9 December 2019

Ahumada et al., The 16th Data Release of the Sloan Digital Sky Surveys: First Release from the APOGEE-2 Southern Survey and Full Release of eBOSS Spectra (Ahumada et al. 2020 [ApJS](#) 249, 3)

- ☆ ADS abstract: [2020ApJS...249...3A](#)
- ☆ Journal publication: [doi:10.3847/1538-4365/ab929e](#)
- ☆ arXiv preprint: [arXiv:1912.02905](#)

Outline

- ☆ Data Release 17
- ☆ Data Release 16
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- ☆ Data Release 4
- ☆ Data Release 3
- ☆ Orion Data Release
- ☆ Data Release 2
- ☆ Data Release 1
- ☆ Early Data Release
- ★ Erratum



The 16th Data Release of the Sloan Digital Sky Surveys: First Release from the APOGEE-2 Southern Survey and Full Release of eBOSS Spectra

Romina Ahumada¹,
Borja Anguiano²,
Carles Badenes³,
Rachael L. Beaton⁴,
Michael R. Blanton⁵,
Joel R. Browning⁶,
Raffaella
Michael Chapman⁷,
Nicholas Clerc⁸,
Kevin Co
Sanna B. D'Ercole⁹,
Axel de
Sylvain de la Taille¹⁰,
John
Arthur Davison¹¹,
Xiaohui Fan¹²,
Amelia
Rafael
Marcio Antonio
Kathleen G.
Sten Hasselquist



The Seventeenth Data Release of the Sloan Digital Sky Surveys: Complete Release of MaNGA, MaStar, and APOGEE-2 Data

Abdurro'uf¹, Katherine Accetta², Conny Aerts³, Víctor Silva Aguirre⁴, Romina Ahumada⁵, Nikhil Ajgaonkar⁶, N. Filiz Ak⁷, Shadab Alam⁸, Carlos Allende Prieto^{9,10}, Andrés Almeida¹¹, Friedrich Anders^{12,13}, Scott F. Anderson¹⁴, Brett H. Anderson¹⁵, Borja Anguiano¹⁶, Erik Aquino-Ortiz¹⁷, Alfonso Aragón-Salamanca¹⁸, Maria Argudo-Fernández¹⁹, Metin Ata²⁰, Marie Aubert²¹, Vladimir Avila-Reese²², Carles Badenes²³, Rodolfo H. Barbá²⁴, Kat Barger²⁵, Jorge K. Barrera-Ballesteros²⁶, Rachael L. Beaton^{27,28}, Timothy C. Beers²⁹, Chad F. Bender³⁰, Mariangela Bernardi³¹, Matthew A. Bershadsky^{32,33}, Florian Beutler³⁴, Christian Moni Bidin³⁵, Jonathan C. Bird³⁶, Dmitry Bizyaev^{37,38}, Guillermo A. Blanc³⁹, Michael R. Blanton⁴⁰, Nicholas Fraser Boardman^{41,42}, Adam S. Bolton⁴³, Médéric Boquien⁴⁴, Jura Borissova^{45,46}, Jo Bovy^{41,42}, W. N. Brandt^{43,44,45}, Jordan Brown⁴⁶, Joel R. Brownstein⁴⁷, Marcella Brusa^{47,48}, Johannes Buchner⁴⁹, Kevin Bundy⁵⁰, Joseph N. Burchett⁵¹, Martin Bureau⁵², Adam Burgasser⁵³, Tuesday K. Cabang⁵⁴, Stephanie Campbell⁵⁵, Michele Cappellari⁵², Joleen K. Carlberg⁵⁶, Fábio Carneiro Wanderley⁵⁵, Ricardo Carrera⁵⁶, Jennifer Cash⁵⁶, Yan-Ping Chen⁵⁷, Wei-Huai Chen⁵⁸, Brian Cherinka⁵⁹, Cristina Chiappini⁶⁰, Peter Doohyun Choi⁵⁹, S. Drew Chojnowski⁶¹, Haeun Chung⁶⁰, Nicolas Clerc⁶⁰, Roger E. Cohen⁶⁴, Julia M. Comerford⁶², Johan Comparat⁶³, Luiz da Costa⁶⁴, Kevin Covey⁶⁵, Jeffrey D. Crane⁶⁶, Irene Cruz-Gonzalez⁶⁶, Connor Culhane⁶⁷, Katia Cunha^{68,69}, Y. Sophia Dai (戴若瑟)⁷⁰, Guillermo Dancke^{65,66}, Jeremy Darling⁶¹, James W. Davidson Jr.⁷¹, Roger Davies⁶⁷, Kyle Dawson⁷², Nathan De Lee⁷³, Aleksandar M. Diamond-Stanic⁷⁴, Mariana Cano-Diaz⁷⁵, Helena Domínguez Sánchez⁷⁶, John Donor⁷⁷, Chris Duckworth⁷⁸, Tom Dwelly⁷⁹, Daniel J. Eisenstein⁸⁰, Yvonne P. Ellsworth⁸¹, Eric Emsellem^{82,83}, Mike Eracleous⁸⁴, Stephanie Escoffier⁸⁵, Xiaohui Fan⁸⁶, Emily Farr⁸⁴, Shuai Feng⁸⁷, José G. Fernández-Trincado⁸⁸, Diane Feuillet^{86,87}, Andreas Filippenko⁸⁸, Sean P. Filippinham⁸⁹, Peter M. Frinchaboy⁹⁰, Sebastian Fromenteau⁹¹, Lluís Galbany⁹², Rafael A. García⁹³, D. A. García-Hernández⁹⁴, Junqiang Ge⁹⁴, Doug Geisler^{95,96,97}, Joseph Gelfand⁹⁸, Tobias Gérton⁹⁹, Benjamin J. Gibson¹⁰⁰, Julian Goddy⁹³, Diego Godoy-Rivera⁹⁴, Kathleen Grabowski¹⁰¹, Paul J. Green¹⁰², Michael Greener¹⁰³, Catherine J. Griest¹⁰⁴, Emily Griffith⁹⁴, Hong Guo⁹⁵, Julien Guy⁹⁶, Massinissa Hadjari^{97,98}, Paul Harding¹⁰⁵, Sten Hasselquist^{95,151}, Christian R. Hayes¹⁰⁶

European Southern Observatory

ESO — Reaching New Heights in Astronomy

Public Science User Portal Intranet

Welcome to the ESO Science Archive Facility

The ESO Science Archive Facility (SAF) contains data from ESO telescopes at La Silla Paranal Observatory, including the APEX submillimeter telescope on Liano de Chajnantor. All raw data from the La Silla Paranal Observatory are stored together with the corresponding calibrations, as well as selected products both contributed by the community or generated at ESO. Processed data downloaded from the ESO Archive are assigned a Digital Object Identifier (DOI). The list of the DOIs currently available can be found [here](#). In addition, the raw UKIDSS/WFCAM data obtained at the UK Infrared Telescope facility in Hawaii are available in the ESO Archive.

The Principal Investigators of successful proposals for time on ESO telescopes have exclusive access to their scientific data for the duration of a proprietary period, normally of one year, after which the data becomes available to the community at large. Please read the [ESO Data Access Policy](#) statement for more information, along with the [relevant FAQs](#).

Browsing the archive does not require authentication. Please [acknowledge the use of archive data](#) in any publication.

There are three main ways to access the archive, varying for content and presentation/interface: the usual Raw Data query form, the innovative Science Portal to browse and access the processed data, and the novel Programmatic and Tools access which permits direct database access to both raw and processed data, and to the ambient condition measurements, also in a scriptable and VO manner. Other query forms are available in the table at the bottom of this page.

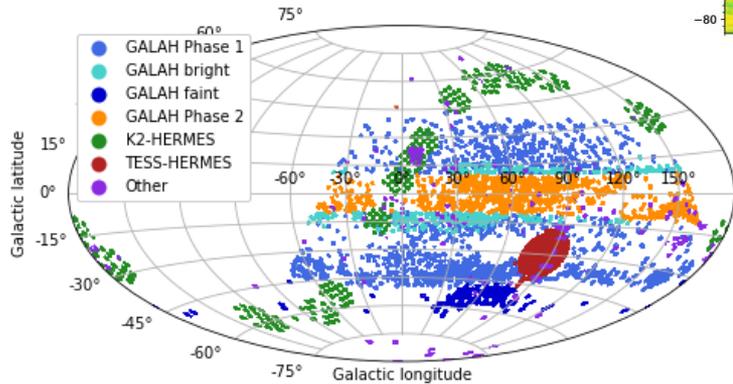
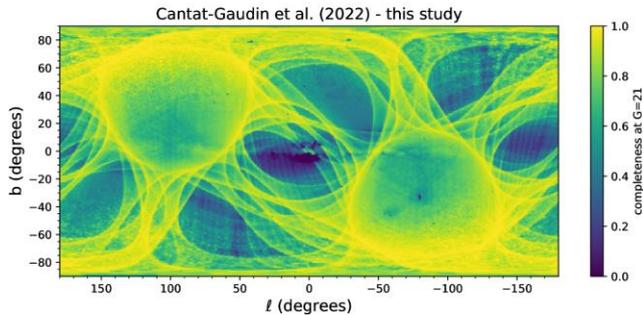
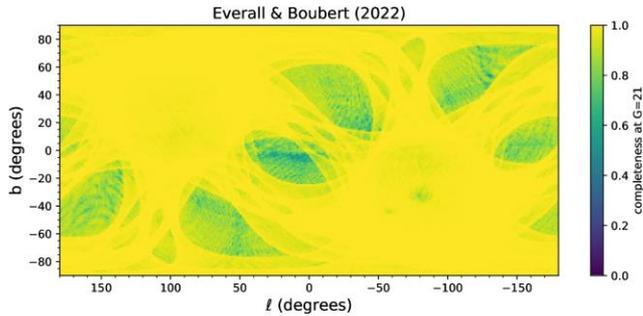
Raw Data Science Portal Catalogue Data

Programmatic Community Forum

Raw, Processed, Catalogue, and Ambient Data Share ideas, ask questions, send feedback

Using public data

- Documentation
- Flags
- Quality assessment
- Selection bias



Bit Name	Binary Digit	Description
TEFF_WARN	0	WARNING on effective temperature (see PARAMFLAG[0] for details)
LOGG_WARN	1	WARNING on log g (see PARAMFLAG[1] for details)
VMICRO_WARN	2	WARNING on vmicro (see PARAMFLAG[2] for details)
M_H_WARN	3	WARNING on metals (see PARAMFLAG[3] for details)
ALPHA_M_WARN	4	WARNING on [alpha/M] (see PARAMFLAG[4] for details)
C_M_WARN	5	WARNING on [C/M] (see PARAMFLAG[5] for details)
N_M_WARN	6	WARNING on [N/M] (see PARAMFLAG[6] for details)
STAR_WARN	7	WARNING overall for star: set if any of TEFF, LOGG, CH2, COLORTE, ROTATION, SN warn are set
CH2_WARN	8	higher than typical χ^2 ($> 30^{\circ}(\text{SNR}/100)^{**2}$)
COLORTE_WARN	9	effective temperature more than 500K from photometric temperature for dereddened color (WARN)
ROTATION_WARN	10	Spectrum has broad lines, with possible bad effects: FWHM of cross-correlation of spectrum with best RV template relative to auto-correlation of template > 1.5 (WARN)
SN_WARN	11	S/N <70 (WARN)
SPEC_HOLE_WARN	12	Grid point within 2 grid steps of hole-filled synthesis
ATMOS_HOLE_WARN	13	grid point within 2 grid steps of hole-filled atmosphere
VSNL_WARN	14	
TEFF_BAD	16	potentially BAD effective temperature (see PARAMFLAG[0] for details)
LOGG_BAD	17	potentially BAD log g (see PARAMFLAG[1] for details)
VMICRO_BAD	18	potentially BAD vmicro (see PARAMFLAG[2] for details)
M_H_BAD	19	potentially BAD metals (see PARAMFLAG[3] for details)
ALPHA_M_BAD	20	potentially BAD [alpha/M] (see PARAMFLAG[4] for details)
C_M_BAD	21	potentially BAD [C/M] (see PARAMFLAG[5] for details)
N_M_BAD	22	potentially BAD [N/M] (see PARAMFLAG[6] for details)
STAR_BAD	23	BAD overall for star: set if any of TEFF, LOGG, CH2, COLORTE, ROTATION, SN error are set, or any GRIDDE_BAD
CH2_BAD	24	significantly higher than typical χ^2 ($> 50^{\circ}(\text{SNR}/100)^{**2}$)
COLORTE_BAD	25	effective temperature more than 1000K from photometric temperature for dereddened color
ROTATION_BAD	26	Spectrum has broad lines, with possible bad effects: FWHM of cross-correlation of spectrum with best RV template relative to auto-correlation of template > 2 (BAD)
SN_BAD	27	S/N <50
SPEC_HOLE_BAD	28	Grid point within 1 grid steps of hole-filled synthesis
ATMOS_HOLE_BAD	29	Grid point within 1 grid steps of hole-filled atmosphere
VSNL_BAD	30	
NO_ASPCAP_RESULT	31	
MISSING_APSTAR	32	Missing apStar file
NO_GRID	33	Not processed by any ASPCAP grid
BAD_FRAC_LOWSNR	34	Fraction low SNR pixels > 0.5
BAD_FRAC_BADPIX	35	Fraction bad pixels > 0.5 or 0.33 in any chip
FERRE_FAIL	36	FERRE failure (bad input?)
PROBLEM_TARGET	40	Target probably not suitable for standard ASPCAP analysis: extended, embedded,

Using public data

- Documentation
- Flags
- Quality assessment
- Selection bias

**Start a
collaboration!**



Policies

Science Team Policies

Document No.: VIS-POL-4MOST-47110-9213-0001

Issue No.: 7.00

DocuShare Document URL: <https://ds-web.aip.de/docushare/dsweb/Services/Document-3648>

6.2.3 Common policies

Every Survey shall admit all research² students of its members upon request. Research students from outside of both the existing ST and the 4MOST Consortium shall be admitted as Community ST members.

A given Survey may admit a new member from outside of both the existing ST and the 4MOST Consortium under the following conditions:

- The proposed new member shall bring a capability or expertise to the Survey that is essential for the preparation of the Survey, allows the Survey to produce a new type of data product or significantly enhances the Survey's ability to scientifically exploit its data.
- Said capability or expertise shall not be available among existing ST members or, if it is, the relevant ST members have declined a collaboration with the Survey (e.g. for lack of time).
- The 4MOST PI can give a temporary Survey membership to those scientists who are in the process of raising funds to become Consortium members. Memberships on this basis will be reviewed once 4MOST is fully funded. If insufficient funding has been contributed to become Consortium member, membership under the previous clause may still be applied for.

Joining a collaboration

- What resources can you offer?
- How many people are interested in being involved?
- Can you get institutional or national support?
- What does the collaboration need from potential members?
- Start small
- Build evidence of success
- Check membership policies

Discussion



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exohost

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