



UNIVERSITY OF TARTU
Tartu Observatory



UPPSALA
UNIVERSITET



AUSTRIAN ACADEMY OF SCIENCES
INSTITUT FÜR WELTRAUMFORSCHUNG



International collaborations, surveys, infrastructure development and use

Diane Feuillet
Uppsala University
EXOHOST, 7 November 2024



Funded by
the European Union



UK Research
and Innovation

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

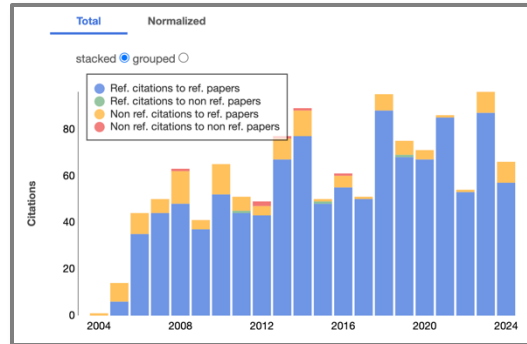
Benefits many
people over a
long period of
time

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
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**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**

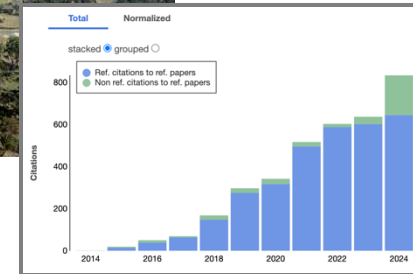
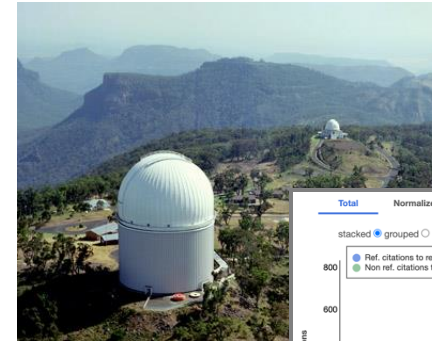
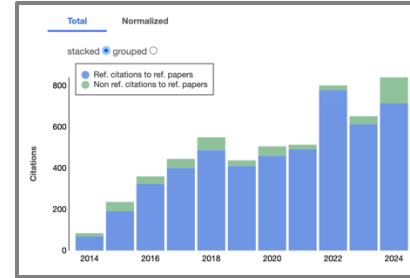
The Hamburg/ESO R-process enhanced star survey (HERES)*, **

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

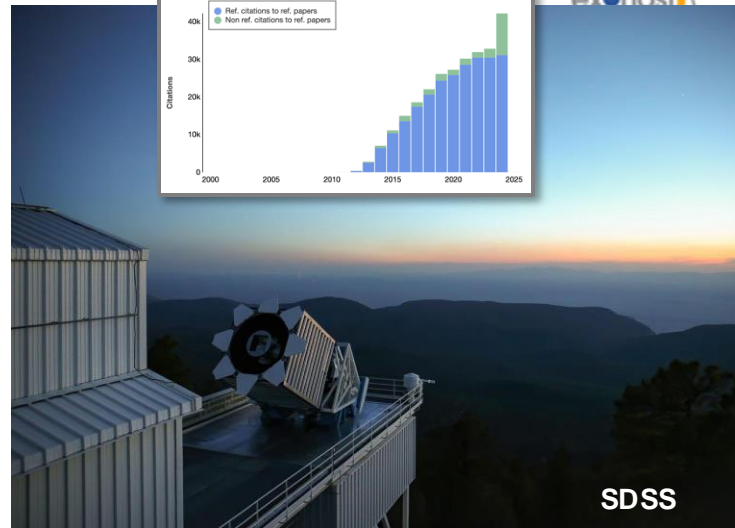
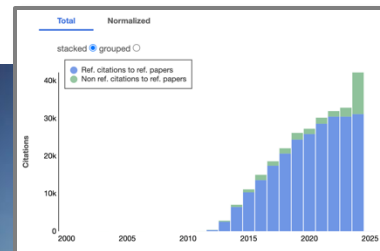
Using existing infrastructure

- 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

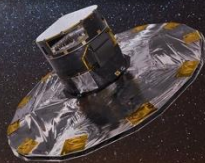
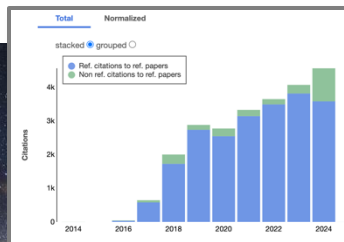


SDSS



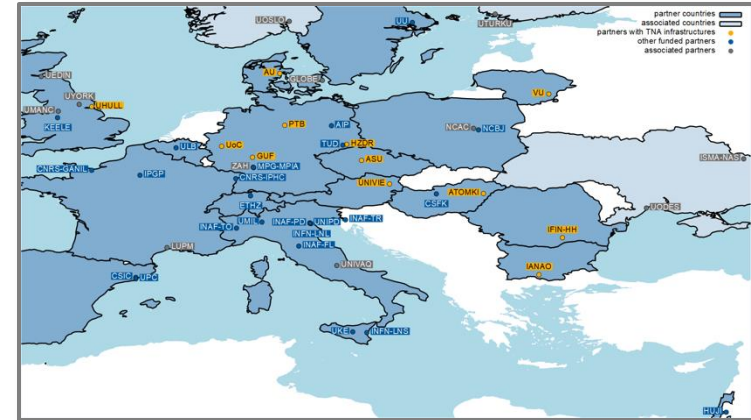
Vera Rubin, LSST

Gaia



VISTA, 4MOST

- 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



Funding

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



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*Knut and Alice
Wallenberg
Foundation*

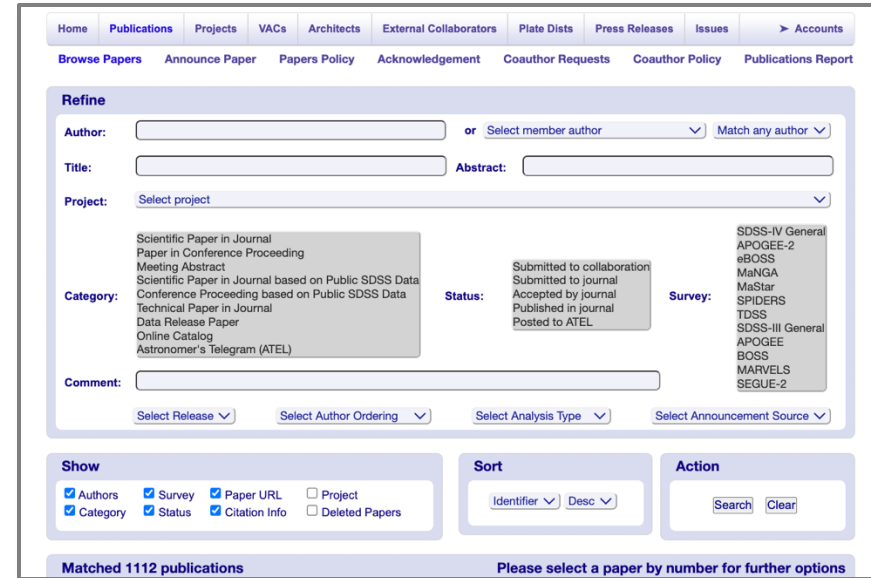


- [illegible]

- Funded by the European Union

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 exo host website. It includes a navigation bar with links like Home, Publications, Projects, VACs, Architects, External Collaborators, Plate Dists, Press Releases, Issues, and Accounts. Below this is a sub-navigation bar with links like Browse Papers, Announce Paper, Papers Policy, Acknowledgement, Coauthor Requests, Coauthor Policy, and Publications Report.

The main content area is titled 'Refine' and contains several search and filter options:

- 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:' dropdown.
- Project:** A dropdown menu for '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)'.
- Status:** A list of statuses including 'Submitted to collaboration', 'Submitted to journal', 'Accepted by journal', 'Published in journal', and 'Posted to ATEL'.
- Survey:** A list of surveys including 'SDSS-IV General', 'APOGEE-2', 'eBOSS', 'MaNGA', 'MaStar', 'SPIDERS', 'TDSS', 'SDSS-III General', 'APOGEE', 'BOSS', 'MARVELS', and 'SEGUE-2'.
- Comment:** A text input field.
- Select Release:** A dropdown menu.
- Select Author Ordering:** A dropdown menu.
- Select Analysis Type:** A dropdown menu.
- Select Announcement Source:** A dropdown menu.

Below the 'Refine' section are three boxes:

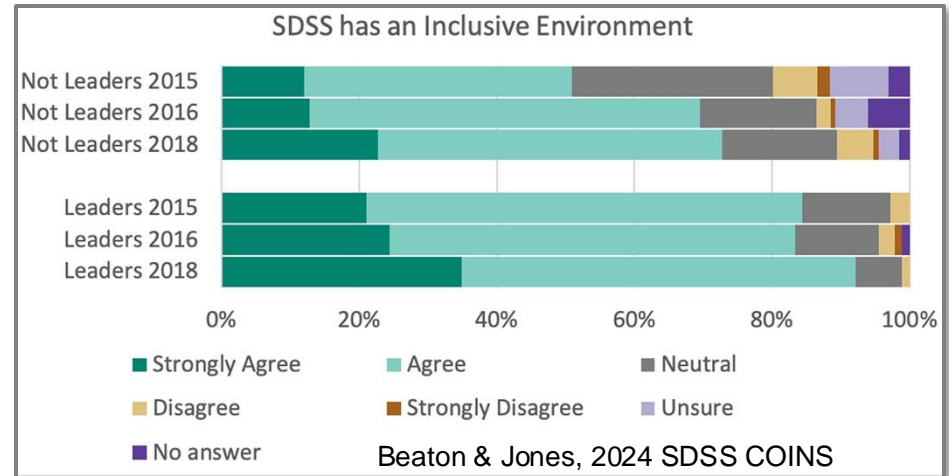
- Show:** Checkboxes for 'Authors', 'Category', 'Survey', 'Status', 'Paper URL', 'Citation Info', 'Project', and 'Deleted Papers'.
- Sort:** A dropdown menu for 'Identifier' and a dropdown for 'Desc'.
- Action:** 'Search' and 'Clear' buttons.

At the bottom, it says '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
- ☆ 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

THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES, 249:3 (21pp), 2020 July
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OPEN ACCESS

<https://doi.org/10.3847/1538-4365/ab929e>



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

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Kevin Covey¹²
Sanna B. Datta¹³
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Sylvain de la Torre¹⁵
John D. H. Jones¹⁶
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THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES, 259:35 (39pp), 2022 April
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<https://doi.org/10.3847/1538-4365/ac4414>

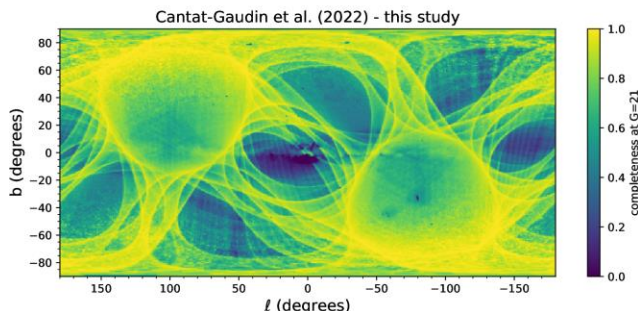
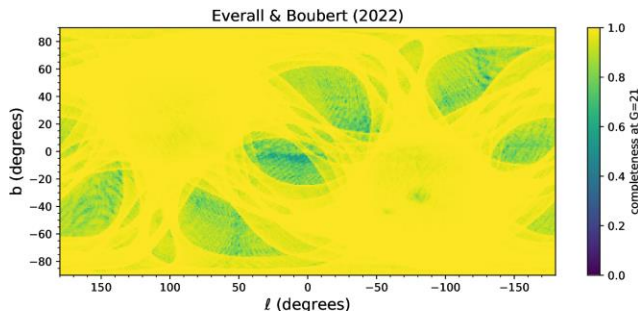
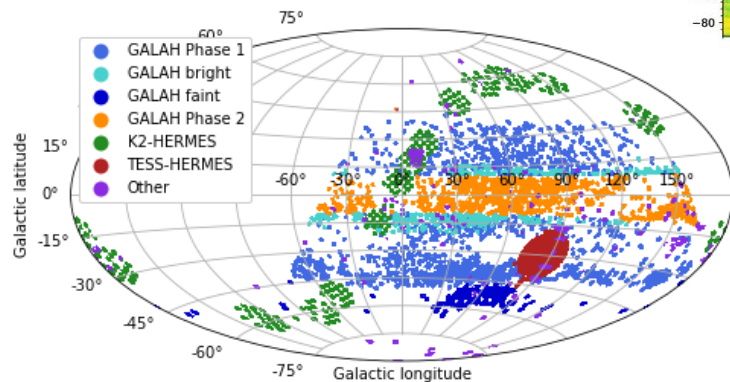


The Seventeenth Data Release of the Sloan Digital Sky Surveys: Complete Release of MaNGA, MaStar, and APOGEE-2 Data

Abdurro'uf¹, Katherine Accetta², Conny Aerts³, Victor 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. Andrews¹⁵, Borja Anguiano¹⁶, Erik Aquino-Ortiz¹⁷, Alfonso Aragón-Salamanca¹⁸, María Argüeso-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, Francesco Belfiore³⁰, Chad F. Bender³¹, Mariangela Bernardi³², Matthew A. Bershad^{33,34}, Florian Beutler³⁵, Christian Moni Bidin³⁶, Jonathan C. Bird³⁷, Dmitry Bizyaev^{38,39}, Guillermo A. Blanc⁴⁰, Michael R. Blanton⁴¹, Nicholas Fraser Boardman^{42,43}, Adam S. Bolton⁴⁴, Médéric Boquien⁴⁵, Jura Borissova^{46,47}, Jo Bovy^{41,42}, W. N. Brandt^{43,44,45}, Jordan Brown⁴⁶, Joel R. Brownstein⁴⁵, Marcella Brusa^{47,48}, Johannes Buchner⁴⁹, Kevin Bundy⁵⁰, Joseph N. Burchett⁵¹, Martin Bureau⁵², Adam Burgasser⁵³, Tuesday K. Cabang⁵⁴, Stephanie Campbell⁵⁵, Michele Cappellari⁵², Joleen K. Carlberg⁵⁴, Fábio Carneiro Wanderley⁵⁶, Ricardo Carrera⁵⁷, Jennifer Cash⁵⁸, Yan-Ping Chen⁵⁹, Wei-Huai Chen^{1,58}, Brian Cherinka⁶⁰, Cristina Chiappini⁶¹, Peter Doohyun Choi⁶², S. Drew Chożnowski⁶³, Haeun Chung⁶⁴, Nicolas Clerc⁶⁵, Roger E. Cohen⁶⁶, Julia M. Comerford⁶⁷, Johan Comparat⁶⁸, Luiz da Costa⁶⁹, Kevin Covey⁷⁰, Jeffrey D. Crane⁷¹, Irene Cruz-Gonzalez⁷², Connor Culhae⁷³, Katia Cunha^{74,75}, Y. Sophia Dai (戴慧婷)⁷⁶, Guillermo Damke⁷⁷, Jeremy Darling⁷⁸, James W. Davidson Jr.⁷⁹, Roger Davies⁸⁰, Kyle Dawson⁸¹, Nathan De Lee⁸², Aleksandar M. Diamond-Stanic^{83,84}, Mariama Cane Díaz⁸⁵, Helena Domínguez Sánchez⁸⁶, John Donor⁸⁷, Chris Duckworth⁸⁸, Tom Dwelly⁸⁹, Daniel J. Eisenstein⁹⁰, Yvonne P. Elsworth⁹¹, Eric Emsellem^{92,93}, Mike Eracleous⁹⁴, Stephanie Escoffier⁹⁵, Xiaohui Fan⁹⁶, Emily Fari⁹⁷, Shuai Feng⁹⁸, José G. Fernández-Trincado⁹⁹, Diane Feuillet¹⁰⁰, Andreas Filippenko¹⁰¹, Sean P. Fillingham¹⁰², Peter M. Frinchaboy¹⁰³, Sébastien Fromenteau¹⁰⁴, Lluís Galbany¹⁰⁵, Rafael A. García¹⁰⁶, D. A. García-Hernández^{107,108}, Junqiang Ge¹⁰⁹, Doug Geisler^{65,81,82}, Joseph Gelfand¹¹⁰, Tobias Gérón¹¹¹, Benjamin J. Gibson¹¹², Julian Goddy¹¹³, Diego Godoy-Rivera¹¹⁴, Kathleen Grabowski¹¹⁵, Paul J. Green¹¹⁶, Michael Greener¹¹⁷, Catherine J. Griest¹¹⁸, Emily Griffith¹¹⁹, Hong Guo¹²⁰, Julien Guy¹²¹, Massimissa Hadjara¹²², Paul Harding¹²³, Sten Hasequist¹²⁴, Christian R. Hayes¹²⁵

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, COLORT, ROTATION, SN warn are set
CH2_WARN	8	higher than typical χ^2 ($> 30^{\circ} \text{SNR}/100^{\circ} \text{M}^2$)
COLORT_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
VSINL_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, COLORT, ROTATION, SN error are set, or any GRIDGE_BAD
CH2_BAD	24	significantly higher than typical χ^2 ($> 50^{\circ} \text{SNR}/100^{\circ} \text{M}^2$)
COLORT_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
VSINL_BAD	30	
NO_ASCAP_RESULT	31	
MISSING_APSTAR	32	Missing apStar file
NO_GRID	33	Not processed by any ASCAP 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 ASCAP analysis: extended, embedded,

Using public data

- Documentation
- Flags
- Quality assessment
- Selection bias

Start a
collaboration!



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

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.

Discussion



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This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101079231 (EXOHOST), and from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee (grant number 10051045).