Sven Buder - Curriculum Vitae

Research Interests

- Galactic archaeology with large international surveys
- Stars as tool to understand galaxy evolution through the lens of the Milky Way
- Developing state-of-the-art stellar spectroscopy to constrain stellar evolution and planet formation
- The origin of the elements across cosmic time

Professional Appointments

Since 2023 **Fellow, Galactic Archaeology and Stellar Physics (Level C)**
Research School of Astronomy and Astrophysics (RSAA) at the Australian National University (ANU) and Australian Research Council Centre of Excellence in All Sky Astrophysics in 3 Dimensions (ASTRO 3D), Canberra, Australia

05–09/2023 **Secondment as Research Software Engineer**
Australian Earth System Simulator (ACCESS-NRI), an NCRIS national research infrastructure facility to support the modelling and comparison of climate models, Canberra, Australia

2019–2022 **Research Fellow, Galactic Archaeology and Stellar Physics (Level B)**
RSAA/ANU and ASTRO 3D, Canberra, Australia

2010–2013 **Assistant**
Office of Federal Minister Dr Thomas de Maizière, German Federal Parliament, Berlin

Education

2015–2019 **PhD in Astronomy and Astrophysics**,
Max-Planck-Institute for Astronomy & University of Heidelberg (16 July 2019)
PhD Thesis: Spectroscopic Analysis & Chemodynamic Exploration of the Milky Way with Million-Star Surveys. Supervisors: Prof Dr Karin Lind & Prof Dr Melissa Ness

2013–2015 **Master of Science in Physics**, Friedrich Schiller University Jena, Germany

2010–2013 **Bachelor of Science in Physics**, Friedrich Schiller University Jena, Germany

Fellowships & Awards

2023 ARC Discovery Early Career Researcher Award (DECRA, DE24, 459 000 AUD)

2023 Louise Webster Prize of the Astronomical Society of Australia (2 500 AUD)

2022 ASTRO 3D Award for the Centre Member who most embodies ASTRO 3D values

2017–2020 German-Australian travel stipend of the Group of Eight UA-DAAD (25 000 AUD)

2015–2019 International Max Planck Research School Graduate Fellowship (5 000 AUD)

2014 European exchange fellowship ERASMUS+ to Uppsala University (4 000 AUD)

Research Outcomes

- 75 refereed publications in top-tier (Q1) journals. 2 655 citations, h-index of 27 (Google Scholar)
- 4 refereed first-author publications with highest impact:
  - Buder et al., 2022 (48 citations): Chemical tagging of accreted stars in the Milky Way.
  - Buder et al., 2021 (273 citations): Unprecedented catalog of chemical compositions of 600 000 stars accompanied by age and orbit estimates. Highest cited paper of MNRAS in 2021.
  - Buder et al., 2019 (103 citations): Identifying the best way to dissect Galactic disk populations.
  - Buder et al., 2018 (340 citations): Innovative data-driven spectrum analysis for 340 000 stars.

My full publication list can be found at the end of this CV.

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Leadership and Collaboration

- Review Panel Member of 4MOST Galactic Pipeline
- Management convener & working group leader of the international GALAH Survey (60 members)
- Chair of ASTRO 3D's national Early Career Researcher Committees (since 2021)
- Member of international observational research collaborations: GALAH (since 2015), *Gaia*-ESO (2015–2019), SDSS-IV (2015–2019), 4MOST (since 2019), GECKOS (since 2022)

Talks, Seminars, Workshops

14 **Invited Talks**, *at National and International Meetings (since 2017)*
11 **Invited Colloquia/Seminars**, *at National and International Institutions (since 2017)*
6 **Invited Participations**, *at exclusive International Expert Workshops (since 2016)*
13 **Contributed Talks**, *at National and International Conferences (since 2016)*
5 **Outreach Talks**, *throughout Australia (since 2021)*

09/2023, **Invited Talk**, ESO Conference Spectral Fidelity, Firenze, Italy
07/2023, **Invited Talk**, ASA Annual Meeting, Sydney, Australia
11/2022, Contributed Talk, Linking the Galactic and Extragalactic, Wollongong, Australia
11/2022, **Invited Seminar**, Universidad Diego Portales, Santiago, Chile
11/2022, **Invited Participation**, ESO Workshop on Benchmark Stars, Santiago, Chile
11/2022, Contributed Talk, ASTRO 3D Annual Retreat, Adelaide, Australia
10/2022, Outreach Talk, ANU Open Days, Siding Spring Observatory, Australia
09/2022, **Invited Talk**, Ken Freeman@80, Perth, Australia
08/2022, Contributed Talk, IAU General Assembly, Busan, South Korea (virtual)
07/2022, **Invited Colloquium**, Monash University, Melbourne, Australia
07/2022, **Invited Colloquium**, Swinburne University, Melbourne, Australia
07/2022, **Invited Colloquium**, University of Melbourne, Melbourne, Australia
06/2022, **Invited Seminar**, Uppsala University, Uppsala, Sweden
02/2022, Outreach Talk, Tamworth Astronomical Society, Tamworth, Australia (virtual)
02/2022, **Invited Colloquium**, ASTRO 3D, Australia (virtual)
11/2021, Outreach Talk, Astronomical Society of NSW, Sydney, Australia (virtual)
11/2021, **Invited Seminar**, Leibniz-Institute for Astrophysics (AIP), Potsdam, Germany (virtual)
11/2021, **Invited Seminar**, University of Bologna, Bologna, Italy (virtual)
09/2021, Outreach Talk, Astronomical Society of Coonabarabran, Coonabarabran, Australia (virtual)
09/2021, **Invited Talk**, ACAMAR (Australia-China) Future of Traditional Survey Science (virtual)
07/2021, Contributed Talk, ASA Annual Meeting, Australia (virtual)
06/2021, **Invited Talk**, GALAH Science Meeting, virtual
06/2021, Contributed Talk, EAS Annual Meeting, Europe (virtual)
03/2021, **Invited Talk**, Reference stars for all-sky surveys, virtual
06/2020, Contributed Talk, ASTRO 3D Science Meeting, Australia (virtual)
10/2019, **Invited Talk**, The Milky Way 2019: LAMOST and Other Leading Surveys, Yichang, China
09/2019, **Invited Talk**, The Legacy of the *Gaia*-ESO Survey, Firenze, Italy
08/2019, **Invited Colloquium**, Koenigstuhl Colloquium, MPIA, Heidelberg, Germany
06/2019, **Invited Talk**, Stars without Borders, Ljubljana, Slovenia
06/2019, **Invited Lecture**, International School of Space Science, L'Aquila, Italy
06/2019, **Invited Talk**, EAS Annual Meeting Special Session on Metal-poor stars, Lyon, France
11/2018, Contributed Talk, The Life and Times of the Milky Way, Shanghai, China
11/2018, Institute Seminar, Galaxy Coffee, MPIA, Heidelberg, Germany
11/2018, Contributed Talk, Chem. Evolution and Nucleosyn. Across the Galaxy, Heidelberg, Germany
09/2018, Contributed Talk, A revolution in stellar physics with *Gaia* & large surveys, Warsaw, Poland
09/2018, **Invited Talk**, 13th IMPRS Summer School, Heidelberg, Germany
07/2018, Contributed Talk, The metal-poor Galaxy, Ringberg, Germany

06/2018, Institute Seminar, Columbia University, New York City, USA
06/2018, **Invited Participation**, *Gaia* Sprint Workshop, New York City, USA
05/2018, **Invited Seminar**, Lund observatory institute seminar, Lund, Sweden
05/2018, **Invited Talk**, Machine learning in Astronomy and Medicine, Lund, Sweden
03/2018, Institute Seminar, RSAA, Australian National University, Canberra, Australia
11/2017, **Invited Talk**, A Celebration of CEMP and Gala of GALAH, Melbourne, Australia
11/2017, Institute Seminar, RSAA, Australian National University, Canberra, Australia
08/2017, Institute Seminar, Uppsala University, Uppsala, Sweden
07/2017, Contributed Talk, IAU Symposium 334: Rediscovering our Galaxy, Potsdam, Germany
07/2017, **Invited Participation**, *Gaia* Sprint Workshop, Heidelberg, Germany
06/2017, Contributed Talk, JINA-CEE Forging Connections, East Lansing, USA
06/2017, **Invited Talk**, Southern Cross Survey Conference, Sydney, Australia
06/2017, **Invited Seminar**, University of Sydney SIfA institute seminar, Sydney, Australia
05/2017, Institute Seminar, Galaxy Coffee, MPIA, Heidelberg, Germany
11/2016, Contributed Talk, Galactic Archaeology and Stellar Physics, Canberra, Australia
10/2016, **Invited Participation**, *Gaia* Sprint Workshop, Heidelberg, Germany
07/2016, **Invited Participation**, Industrial Revolution in Gal. Archaeology Workshop, Sexten, Italy
07/2016, **Invited Participation**, *Gaia* FGK Benchmark Stars Workshop, Cambridge, UK

Conference Organisation

SOC **Chair** *ASTRO 3D Science Meeting, Canberra 2021*,
Member *GALAH Science Meeting, virtual 2021*
Member *EWASS 2019 Special Session*, Lyon 2019

LOC 5 Conference and Workshop LOCs in Germany and Australia (2013–2022):
Member *Linking the Galactic and extragalactic*, Wollongong 2022,
Member, *Chemical Evolution and Nucleosynthesis Across the Galaxy*, Heidelberg 2018,
Member *The Metal-Poor Galaxy*, Ringberg Castle 2018,
Member, *Gaia* Sprint, Heidelberg 2017,
Member *Spring conference of the German Physical Society*, Jena 2013

Resource Allocation

Telescopes **PI 12 nights (120 000 AUD)**, *HERMES-2dF@AAT, Siding Spring Observatory*, 2023
Co-I 7 nights (7 000 AUD), *Multi-Imager MuSCAT3@2m, Haleakala Obs.*, 2023
Co-I 506 nights (5.1 Mio AUD), *HERMES-2dF@AAT, SSO*, since 2017
Co-I 3 nights (12 500 AUD), *FEROS@2.2m MPG/ESO, La Silla Observatory*, 2016
Co-I 16 nights (75 000 AUD), *AstraLux at 2.2m, Calar Alto Observatory*, 2013–2015

Computing Parallelised CPU (python and IDL) & GPU computing (python)
2 Mio hours (160 000 AUD) since 2017 at RSAA's Avatar
1 Mio hour (80 000 AUD) 2017–2020 at MPG's MPCDF/ISAAC
1 Mio hour (80 000 AUD) 2015–2018 at Sweden's HPC2N/Abisko

Research Supervision

I have supervised research projects of 11 students (5 female, 6 male) at different levels since 2021. PhD and Honours (final year) supervision includes regular meetings and mentoring for research, research paper and proposal writing, and career progression. Supervision for ASC, ASTR3005, and ASTR8001 (semester research projects with 150 hours for BSc Honours, BSc, and MSc students, respectively) includes weekly meetings.

PhD **Madeleine McKenzie (ANU)**, *co-supervisor*, Tracing the Formation of Globular Clusters with stellar chemistry, since 2023

PhD **Evans Owusu (UNSW, Australia)**, *co-supervisor*, Tracing The Origin Of Stellar Evolution in the Milky Way, since 2022

PhD **Xu Zhang (CAS, China)**, *primary supervisor (1 year visit)*, Age-abundance correlations with C and N in GALAH and LAMOST, 1 refereed paper, 2022

Honours **Luka Mijnarends (ANU)**, *primary supervisor*, Chemical enrichment from resolved and unresolved spectroscopy in NGC 6822, 2023

Honours **Anne Xie (ANU)**, *primary supervisor*, Stellar abundance irregularities from optical and infrared spectroscopy with GALAH and APOGEE, 2023

ASTR3005 **Patrick O'Connor (ANU)**, *primary supervisor*, High-precision differential abundances of Globular Clusters, 2023

ASTR3005 **Timothy Scarr (ANU)**, *primary supervisor*, Neural network architecture and hyper-parameters for stellar spectrum interpolation, 2023

ASTR8001 **Colleen Feuerborn (ANU)**, *primary supervisor*, Modelling Stellar Barium Abundance with GALAH, 2022

ASTR3005 **Ali Mort (ANU)**, *primary supervisor*, Stellar ages from GALAH spectra, 2022

ASTR3005 **Lam Xuan Tran (ANU)**, *primary supervisor*, C and N abundances in GALAH spectra, 2022

ASTR3005 **Luka Mijnarends (ANU)**, *primary supervisor*, How simulations can inform observations of the chemistry of accreted stars, 2021

ASTR3005 **Bailey Martin (ANU)**, *primary supervisor*, Influences on line-by-line GALAH elemental abundances, 2021

ASC **Anne Xie (ANU)**, *primary supervisor*, The influence of microturbulence velocity on stellar metallicity estimates in GALAH DR3, 2021

Teaching

Lectures Guest Lecture at ANU's ASTR4006 Galaxies Course, *2022*

Guest Lecture at ANU's ASTR2013 Fundamental of Astrophysics Course, *2021*

Lecture at International School of Space Science, L'Aquila, Italy, *2019*

Tutoring Field Trip to SSO and Tutorials for ANU's ASTR2013 Course, *since 2020*

3 practical courses at Heidelberg University and University Jena, *2013, 2014, and 2017*

Service

National ASTRO 3D Senior ECR Committee since 2023
ASTRO 3D Equity Diversity and Inclusion Committee since 2022
ASTRO 3D Junior ECR Committee 2020–2022

Institute Colloquium Committee since 2019 (chair 2020-2021)
International PhD Scholarship selection committee 2019-2022
Inclusion, Diversity, Equity and Access Committee since 2022

Outreach 3 talks at Astronomical Societies in Australia
ANU Open Days 2022
Stromlo Outreach Team since 2022
Co-founder Astronomy on Tap Heidelberg 2017–2019

Referee A&A, ApJ, ApJS, PASA

Others

Press Coverage (2022) The Milky Way is a giant 'smoothie' of blended stars, *SBS News*, *space.com*, *Cosmos Magazine*, *(2018) The hunt for the Sun's ancient siblings*, astronomy.com

since 2021 Member of Astronomical Society of Australia

Canberra, September 17, 2023

4 years after receiving my PhD in July 2019, I have co-authored 84 publications (75 refereed), including 4 first-author papers and 15 as second/third author with ORCID ID 0000-0002-4031-8553. My refereed publications have attracted 2 421 citations leading to a h-index of 26 as tracked by ADS (see also Google Scholar for a different tracking service with an h-index of 27 based on 2 655 citations).

Below, I list my ten most important peer-reviewed publications as well as papers of my students with explanations of my critical contributions to them. I explain major contributions to other papers and complete the publication list with papers with minor contributions, submitted papers, and not peer-reviewed papers.

PhD Thesis

2019 **Buder, S.**: Spectroscopic Analysis and Chemodynamic Exploration of the Milky Way with Million-Star Surveys, Heidelberg University.

Ten most important peer-reviewed publications

2021 **Buder, S.**, Sharma, S., Kos, J., et al.: The GALAH+ survey: Third data release, MNRAS, 506, 150. 264 citations.
I was leader of the data release. I chaired the spectroscopic analysis with input from my working group, and developed all spectroscopic analysis myself, with input and advice from my team. I drafted the majority of the manuscript myself.

2018 **Buder, S.**, Asplund, M., Duong, L. et al.: The GALAH Survey: Second Data Release, MNRAS, 478, 4513. 269 citations.
I was leader of the data release, and a major contributor for data analysis. I developed the pipeline to analyse more than 342,000 stars for the measurement of a record-breaking 23 elemental abundances in each star. My programming enabled analysis of this large data set with unprecedented speed. I wrote the vast majority of the manuscript and coordinated input from experts for specific paragraphs.

2019 **Buder, S.**, Lind, K., Ness, M., et al.: The GALAH survey: An abundance, age, and kinematic inventory of the solar neighbourhood made with TGAS, A&A, 624, 19. 89 citations.
I performed this study myself, from the extraction of abundances from spectra and estimation of ages as well as kinematics, and their combination to create a full stellar inventory. I developed the key idea to dissect the disc populations through combinations of different properties. I drafted all text for this paper.

2022 **Buder, S.**, Lind, K., Ness, M., Feuillet, D. K., et al.: The GALAH Survey: Chemical tagging and chrono-chemodynamics of accreted halo stars with GALAH+ DR3 and *Gaia* eDR3, MNRAS, 510, 2407. 40 citations.
I performed this study myself. I have assessed abundance differences between different stellar samples, implemented Gaussian mixture models to identify those with patterns of accreted stars and compare the found distributions with literature results and dynamical selections. I have interpreted the found differences myself and wrote all of the manuscript.

2017 Martell, S. L., Sharma, S., **Buder, S.**, et al.: The GALAH survey: observational overview and *Gaia* DR1 companion, MNRAS, 465, 3203. 152 citations.
I was the main spectroscopic analyst and developed the spectroscopic pipeline. I contributed both the data and the description of its analysis to the paper.

2019 Bland-Hawthorn, J., Sharma, S., Tepper-Garcia, T., **et al.**: The GALAH survey and *Gaia* DR2: dissecting the stellar disc's phase space by age, action, chemistry and location, MNRAS, 486, 1167. 152 citations.
I contributed the preliminary spectroscopic data for this data and was a major contributor in terms of advice on the interpretation of GALAH data in combination with ages.

2019 Xiang, M., Ting, Y.-S., Rix, H.-W., **et al.**: Abundance Estimates for 16 Elements in 6 Million Stars from LAMOST DR5 Low-Resolution Spectra, ApJS, 245, 34. 126 citations.
I contributed expertise on training the spectroscopic algorithm of *The Payne* on measured GALAH properties. I contributed the explanation of all GALAH-related text and advised the optimisation of abundance measurements and their reliability.

2017 Jofré, P., Heiter, U., Worley, C. C.; **et al.**: *Gaia* FGK Benchmark stars: Opening the black box of stellar element abundance determination, A&A, 601, 38. 46 citations.
I contributed to this vital study of influences on abundance measurements through my expertise on one of the six methods used for comparison. I contributed all text related to this method. I also contributed to the explanation of different influences, in particular those found between my method and others.

2020 Gao, X., Lind, K., Amarsi, M. A., **Buder, S.**, et al.: The GALAH Survey: A new constraint on cosmological lithium and Galactic lithium evolution from warm dwarf stars, MNRAS, 497, 30. 18 citations.
I contributed the preliminary hundreds of thousands of measurements of Li abundances, that made it possible to perform this study. I contributed text on the spectroscopic analysis and advised on the reliability of certain measurement. I also performed detailed validations of individual spectra and measurements.

2021 Buck, T., Rybizki, J., **Buder, S.**, et al.: The challenge of simultaneously matching the observed diversity of chemical abundance patterns in cosmological hydrodynamical simulations, MNRAS, 508, 3365. 24 citations.
In this pioneering study, I contributed the observational expertise to complement the theoretical expertise in the team. I also contributed the comparisons with observations and the conclusions drawn from these.

Peer-reviewed publications by students

2021 Zhang, X., **Buder, S.**, Wu, Y., Zhao, G.: Estimation of Ages and Masses via Carbon and Nitrogen Abundances for 556,007 Giants from LAMOST, RAA, 9, 216.
I advised Xu on the application of quality cuts for this study in order to estimate reliable ages and stimulated his critical thinking during the editing of the manuscript. I guided Xu through discussions of possibly significant and new trends between trends with ages. Under my tutorage, Xu performed an age-resolved study of the thin and thick disk populations and quantified the drastic change of their scale-heights with stellar age.

2020 Wheeler, A., Ness, M., **Buder, S.**, et al.: Abundances in the Milky Way across Five Nucleosynthetic Channels from 4 Million LAMOST Stars, ApJ, 898, 58.
I introduced Adam to the spectroscopic data set of GALAH and advised on the setup of the analysis code, *The Cannon* with GALAH measurements as training input. I advised Adam on the found trends when propagating GALAH information via LAMOST spectra. I also advised him with the interpretation of the abundance trends for the different nucleosynthetic channels.

Other peer-reviewed publications with major contribution

2022 Griffith, E. J., Weinberg, D. H., **Buder, S.**, et al.: Residual Abundances in GALAH DR3: Implications for Nucleosynthesis and Identification of Unique Stellar Populations, ApJ, 931, 23.
In this pioneering collaboration, I contributed the observational expertise to the group of theoretical experts. I have advised the interpretation of abundance trends, a vital contribution to this project that aims to identify peculiar, but reliable abundances. I computed synthetic spectra with predicted abundances in order to compare with best-fit and observed spectra.

2022 Horta, D., Ness, M. K., Rybizki, J., Schiavon, R. P., **Buder, S.**: Neutron-capture elements record the ordered chemical evolution of the disc over time, MNRAS, 513, 5477.
In this pioneering collaboration, I contributed the observational expertise to interpret the trends that were found within GALAH data. I advised the selection of trustworthy abundances and gave insight into possible reasons of unexpected abundance trends.

2022 Nandakumar, G., Hayden, M. R., Sharma, S., **Buder, S.**, et al.: The GALAH survey: Milky Way disc metallicity and alpha-abundance trends in combined APOGEE-GALAH catalogues, MNRAS, 513, 232.
I have provided the code to perform cross-matches of the APOGEE and GALAH surveys and trained Govind to perform spectroscopic cross-calibrations with *The Cannon*. I provided key insight into the peculiarities of both surveys and advised the quantification and interpretation of spatial abundance trends.

2021 Zwitter, T., Kos, J, **Buder, S.**, et al.: The GALAH+ Survey: A New Library of Observed Stellar Spectra Improves Radial Velocities and Reveals Motions within M67, MNRAS, 508, 4202.
I contributed the preliminary spectroscopic data and advised on the validation of found trends. I also advised on the use of specific absorption lines in order to improve the precision.

2021 Simpson, J. D., Martell, S. L., **Buder, S.**, et al.: The GALAH Survey: Accreted stars also inhabit the Spite Plateau, MNRAS, 507, 43.
I contributed the preliminary spectroscopic data and advised the validation of found trends. I performed the detailed inspection of metal-poor stars and contributed the description of the data.

2021 Kos, J., Bland-Hawthorn, J., **Buder, S.**, et al.: The GALAH survey: Chemical homogeneity of the Orion complex, MNRAS, 506, 4232.
I advised the setup of the spectroscopic analysis routine, which is an adjusted version of my GALAH pipeline.

2021 Martell, S., Simpson, J., Balasubramaniam, A., **Buder, S.**, et al.: The GALAH survey: A census of lithium-rich giant stars, MNRAS, 505, 5340.
I contributed the spectroscopic data and its description in the manuscript. I advised on its analysis in order to validate trends of the highly peculiar lithium-rich giant stars.

2020 Amarsi, A. M., Lind, K., Osorio, Y., et al.: The GALAH Survey: non-LTE departure coefficients for large spectroscopic surveys, A&A, 642, 62.
I performed the spectroscopic analysis assuming either 1D LTE or 1D non-LTE with the departure coefficients provided by the co-authors. I contributed the description of the spectroscopic analysis and advised on the interpretation of abundance trends.

2019 Kos, J., Bland-Hawthorn, J., Asplund, M., **Buder, S.**, et al.: Discovery of a 21 Myr old stellar population in the Orion complex, A&A, 631, 166.
I was co-investigator on the observing proposal, performed several observations, and advised on the membership classification.

2018 Kos, J., Bland-Hawthorn, J., Freeman, K., **Buder, S.**, et al.: The GALAH Survey: Chemical Tagging of Star Clusters and New Members in the Pleiades, MNRAS, 473, 4612
I provided the spectroscopic data for this project. Chemical tagging could only be performed based on my abundance measurements and my expertise on their reliability. I contributed the description of this analysis in the manuscript.

2018 Wittenmyer, R. A., Sharma, S., Stello, D., **Buder, S.**, et al.: The K2-HERMES Survey. I. Planet Candidate Properties from K2 Campaigns 1-3, AJ, 155, 84
I was the main spectroscopic analyst and developed the spectroscopic pipeline. I contributed both the data and the description of its analysis in the paper.

2018 Gao, X., Lind, K., Amarsi, A. M., **Buder, S.**, et al.: The GALAH Survey: Verifying abundance trends in the open cluster M67 using non-LTE spectroscopy, MNRAS, 481, 2666.
I have provided the analysis pipeline and helped to adjust it to handle spectra of the HERMES spectrograph in the higher resolution mode (50k instead of 28k). I contributed to all steps of the spectroscopic analysis and contributed parts of the manuscript.

2018 Zwitter, T., Kos, J., Chiavassa, A., **Buder, S.**, et al.: The GALAH Survey: Accurate Radial Velocities and Library of Observed Stellar Template Spectra, MNRAS, 481, 645.
I contributed the preliminary spectroscopic data and advised on the selection of parameter ranges for the creation stellar templates.

2018 Kos, J., de Silva, G., **Buder, S.**, et al.: The GALAH Survey and *Gaia* DR2: (Non)existence of five sparse high-latitude open clusters, MNRAS, 480, 5242.
I contributed the preliminary spectroscopic data and aided the setup of the membership estimation.

2018 Sharma, S., Stello, D., **Buder, S.**, et al.: The TESS-HERMES survey Data Release 1: high-resolution spectroscopy of the TESS southern continuous viewing zone, MNRAS, 473, 2004.
I was the main spectroscopic analyst and developed the spectroscopic pipeline. I contributed both the data and the description of its analysis in the paper.

2017 Przybilla, N., Aschenbrenner, P., **Buder, S.**: Candidate exoplanet host HD131399A: a nascent Am star, A&A, 604, 9.
I performed the observations and reductions during an observation run at La Silla Observatory (Chile).

2017 Mugrauer, M., **Buder, S.**, Reum, F., Birth, A.: The Großschwabhausen binary survey, AN, 338, 61.
I performed the vast majority of measurements, reduced all data, and performed all astrometric calibrations and measurements. I contributed to the description of the relevant sections in the manuscript.

2016 Ginski, C., Mugrauer, M., Seeliger, M., **Buder, S.**, et al.: A lucky imaging multiplicity study of exoplanet host stars - II, MNRAS, 457, 2173.
I performed multiple observing runs for this project at Calar Alto Observatory (Spain) and performed the data reduction.

Other peer-reviewed publications with minor contribution

2023 Banks, K. A., Ho, C. Y. Y., Martell, S. L., **Buder, S.**, et al.: CN and CO features: key indicators of red giant evolutionary phase in moderate-resolution X-shooter spectra, MNRAS, 523, 80.

2023 Monty, S., Yong, D, Massari, D., et al.: Peeking beneath the precision floor - II. Probing the chemo-dynamical histories of the potential globular cluster siblings, NGC 288 and NGC 362, MNRAS, 522, 4404.

2023 Vogrinčič, R, Kos, J., Zwitter, T., et al.: The GALAH survey: new diffuse interstellar bands found in residuals of 872 000 stellar spectra, MNRAS, 521, 3727.

2023 Ciucă, I., Kawata, D., Ting, Y.-S., Grand, R. J. J., **et al.**: Chasing the impact of the Gaia-Sausage-Enceladus merger on the formation of the Milky Way thick disc, MNRAS, in print.

2023 Da Costa, G. S., Bessell, M. S., Nordlander, T., Hughes, A. C. N., **Buder, S.**, et al.: Spectroscopic follow-up of statistically selected extremely metal-poor star candidates from GALAH DR3, MNRAS, 520, 917.

2022 Vitali, S., Arentsen, A., Starkenburg, Else., Jofré, P., **et al.**: The Pristine Inner Galaxy Survey (PIGS) - IV. A photometric metallicity analysis of the Sagittarius dwarf spheroidal galaxy, MNRAS, 517, 6121.

2022 Hayden, M. R., Sharma, S., Bland-Hawthorn, J., et al.: The GALAH Survey: Chemical Clocks, MNRAS, 517, 5325.

2022 Hughes, A. C. N., Spitler, L. R., Zucker, D. B., Nordlander, T., et al.: The GALAH Survey: A New Sample of Extremely Metal-Poor Stars Using A Machine Learning Classification Algorithm, ApJ, 930, 47.

2022 Mugrauer, M., Schlagenhauf, S., **Buder, S.**, Ginski, C., Fernández, M.: Follow-up observations of the binary system γ Cep, AN, 343, 24014.

2022 Clark, J. T., Wright, D. J., Wittenmyer, R. A., Horner, J., et al.: The GALAH Survey: improving our understanding of confirmed and candidate planetary systems with large stellar surveys, MNRAS, 510, 2041.

2021 Zinn, J., Stello, D., Elsworth, Y., Garciá, R. A., et al.: The K2 Galactic Archaeology Program Data Release 3: Age-abundance Patterns in C1-C8 and C10-C18, ApJ, 926, 191.

2021 Huang, Y., Yuan, H., Li, C., Wolf, C., et al.: Erratum: Milky Way Tomography with the SkyMapper Southern Survey. II. Photometric Re-calibration of SMSS DR2, ApJ, 924, 141.

2021 Clark, J., Clerte, M., Hinkel, N., Unterborn, C., et al.: The GALAH Survey: using galactic archaeology to refine our knowledge of TESS target stars, MNRAS, 504, 4968.

2021 Kos, J., Bland-Hawthorn, J., **Buder, S.**, et al.: Erratum: The GALAH survey: Chemical homogeneity of the Orion complex, MNRAS, 508, 4969.

2021 Sharma, S., Hayden, M. R., Bland-Hawthorn, J., et al.: The GALAH Survey: Dependence of elemental abundances on age and metallicity for stars in the Galactic disc, MNRAS, 510, 734.

2021 Casagrande, L., Lin, J., Rains, A. D., Liu, F., et al.: The GALAH survey: effective temperature calibration from the InfraRed Flux Method in the *Gaia* system, MNRAS, 507, 2684.

2021 Sharma, S., Hayden, M. R., Bland-Hawthorn, J., Stello, D., et al.: Fundamental relations for the velocity dispersion of stars in the Milky Way, MNRAS, 506, 1761.

2021 Arentsen, A., Starkenburg, E., Aguado, D., Martin, N., et al.: The Pristine Inner Galaxy Survey (PIGS) III: carbon-enhanced metal-poor stars in the bulge, MNRAS, 505, 1239.

2021 Clark, J. T., Clerte, M., Hinkel, N. R., Unterborn, C. T., et al.: The GALAH Survey: using galactic archaeology to refine our knowledge of TESS target stars, MNRAS, 504, 4968.

2021 Spina, L., Ting, Y.-S., De Silva, G. M., Frankel, N., et al.: The GALAH survey: tracing the Galactic disk with Open Clusters, MNRAS, 503, 3279.

2021 Zucker, D. .B, Simpson, J. D., Martell, S. M., et al.: The GALAH Survey: No chemical evidence of an extragalactic origin for the Nyx stream, ApJ, 912, 30.

2021 Huang, Y., Yuan, H., Li, C., Wolf, C., et al.: Milky Way Tomography with the SkyMapper Southern Survey. II. Photometric Re-calibration of SMSS DR2, ApJ, 907, 68.

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