

Research Interests

- Stellar spectroscopic surveys & their overlap
as GALAH survey builder & member of SDSS-IV / APOGEE-2 & *Gaia*-ESO
- State-of-the-art analysis of stellar spectra with 1D/<3D> Non-LTE spectrum synthesis (mainly *Spectroscopy Made Easy*) & data-driven models (mainly *The Cannon*)
- Chemodynamics & chemical cartography of the Milky Way using GALAH & *Gaia*
- Globular cluster escapees (Co-I of successful FEROS & UVES proposals)
- Multiplicity of exoplanet host stars (Co-I of successful AstraLux proposals)

Education

- 2015–2019 **Ph.D. studies**, Max-Planck-Institute for Astronomy & University of Heidelberg.
[PhD Thesis](#): Spectroscopic Analysis & Chemodynamic Exploration of the Milky Way
with Million-Star Surveys. Supervisors: Dr Karin Lind & Prof Dr Melissa Ness
- 2013–2015 **Master of Science in Physics**, Friedrich Schiller University Jena, Germany.
Fall 2014 **Erasmus exchange semester**, Uppsala University, Sweden.
- 2010–2013 **Bachelor of Science in Physics**, Friedrich Schiller University Jena, Germany.
2010 **Abitur**, Saxonian state gymnasium St. Afra Meißen (boarding school).

Experience

- Starting in **Research Fellow**, *Research School of Astronomy and Astrophysics*,
Oct 2019 *The Australian National University, Canberra, Australia*.
- 2017 **Teaching assistant**, *University of Heidelberg*, Practical physics lab (FP30) for
CCD characterisation & photometric analyses of globular clusters.
- 2013–2015 **Teaching assistant**, *Friedrich Schiller University Jena*, Practical physics lab &
examination of exercises for lecture *Introduction to Astronomy*.
- 2010–2013 **Student assistant**, *Deutscher Bundestag Berlin*,
Parliamentary Bureau of Federal Minister Dr Thomas de Maizière (now a.D.),
Preparation & attendance of appointments, drafts of speeches & letters.

Fellowships

- Since 2015 Fellowship of the International Max Planck Research School for Astronomy and
Cosmic Physics at the University of Heidelberg.
- 2007–2010 Fellowship of the Esther & Silviu Dornier-Foundation.

Presentations

Invited talks

- 2019 The Milky Way 2019: LAMOST and Other Leading Surveys, Yichang, China.
- 2019 Stars without Borders, Ljubljana, Slovenia.
- 2019 EWASS Special Session on Metal-poor stars in Milky Way surveys, Lyon, France.
- 2018 Machine learning in Astronomy and Medicine, Lund, Sweden.
- 2017 A Celebration of CEMP and Gala of GALAH, Melbourne, Australia.
- 2017 Southern Cross, Sydney, Australia.

Selected lectures/colloquia/seminars

- 2019 Lecture at International School of Space Science, L'Aquila, Italy.
- 2018 Lund observatory institute seminar, Lund, Sweden.
- 2017 RSAA colloquium, Canberra, Australia.
- 2017 SIfA institute seminar, Sydney, Australia.

Selected contributed talks

- 2018 The life and times of the Milky Way, Shanghai, China.
- 2018 A revolution in stellar physics with *Gaia* and large surveys, Warsaw, Poland.
- 2017 IAUS 334: Rediscovering our Galaxy, Potsdam, Germany.
- 2017 JINA-CEE Forging Connections, East Lansing, USA.
- 2016 Galactic Archaeology and Stellar Physics, Canberra, Australia.

Skills

Organisational

SOC, *EWASS 2019 Special Section: Science calibrations for future European stellar spectroscopic surveys*, Lyon 2019.

LOC, *Chemical Evolution and Nucleosynthesis Across the Galaxy*, Heidelberg 2018, *The Metal-Poor Galaxy*, Ringberg Castle 2018, *Gaia Sprint*, Heidelberg 2017, *Spring conference of the German Physical Society*, Jena 2013.

Observational

- 2017 **2dF-HERMES**, at Siding Spring Observatory, 3.9 m, 5 nights (as Co-I).
- 2016 **FEROS**, at La Silla Observatory, 2.2 m, 3 nights (as Co-I).
- 2013–2015 **AstraLux**, at Calar Alto Observatory, 2.2 m, 9 nights (as Co-I).
- 2013–2015 **FLECHAS, STK, CTK-II, RTK**, at University Observatory Jena, 0.2–0.9 m, more than 50 nights with spectroscopy, astrometry, & photometry (as PI & Co-I).

Programming

General Python (Jupyter), IDL, Mathematica.

Spectroscopy Spectroscopy Made Easy (incl. development of pipelines), IRAF.

Language

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|-----------------------------|----------------------------|---------------------------------|
| German Mother tongue | Swedish Good (B2) | French School level (A2) |
| English Fluent (C2) | Norwegian Good (B1) | Latin School level (A2) |

Qualifications

- 2009 Advanced emergency medical services, *Johanniter-Unfall-Hilfe e.V.*
- 2008 Moderator & mediator, *Peer Training Sachsen e.V.*

Community service

- Since 2018 **Referee**, *The Astrophysical Journal*.
- Since 2017 **Co-founder**, *Astronomy on Tap Heidelberg*.
- 2014 **Member of hiring committee**, for professor of solid state theory (W3) at *Friedrich Schiller University Jena*.
- 2012–2015 **Member of student council & tuitional council**, Faculty of Physics and Astronomy at *Friedrich Schiller University Jena*.

Heidelberg, July 24, 2019

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Publications

(Co-)authored 35 publications (27 refereed), including 2 first-author papers with ORCID ID [0000-0002-4031-8553](#). In total, the refereed publications have attracted 358 citations as tracked by [ADS](#).

Publications in preparation

- 2019 **Buder, S.**, et al.: The GALAH Survey: Chemodynamic decomposition of the Galaxy, A&A, see [latest draft](#).
- 2019 **Buder, S.**, et al.: The GALAH Survey: Third Data Release, MNRAS, see [latest draft](#).

Submitted publications

- 2019 Gao, X., Lind, K., Amarsia, M. A., **Buder, S.**, et al.: The GALAH Survey: stellar lithium depletion from the Spite plateau to the dip and beyond, MNRAS, submitted.
- 2019 Sharma, S., Stello, D., Bland-Hawthorn, J., Hayden, M.R., **et al.**: The K2-HERMES Survey: Age and Metallicity of the Thick Disc, MNRAS, [arXiv:1904.12444](#).
- 2019 Lin, J., Asplund, M., Casagrande, L., **Buder, S.**, et al.: The GALAH Survey: Temporal Chemical Enrichment of the Galactic Disk, MNRAS, submitted.
- 2019 Khanna, S., Sharma, S., Tepper-Garcia, T., **et al.**: The GALAH survey and Gaia DR2: Linking ridges, arches and vertical waves in the kinematics of the Milky Way, MNRAS, [arXiv:1902.10113](#).
- 2018 Hayden, M., Bland-Hawthorn, J., Sharma, S., **et al.**: The GALAH Survey: Chemodynamics of the Solar Neighbourhood, MNRAS, [arXiv:1901.07565](#).
- 2018 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, [arXiv:1811.11762](#).
- 2018 Simpson, J. D., Stello, D., Sharma, D., **et al.**: The GALAH and TESS-HERMES surveys: high-resolution spectroscopy of luminous supergiants in the Magellanic Clouds and Bridge, MNRAS, [arXiv:1804.05900](#).

Peer-reviewed publications

- 2019 **Buder, S.**, Lind, K., Ness, M., Asplund, M., et al.: The GALAH survey: An abundance, age, and kinematic inventory of the solar neighbourhood made with TGAS, [A&A](#), **624**, [19](#).
- 2018 **Buder, S.**, Asplund, M., Duong, L. et al.: The GALAH Survey: Second Data Release, [MNRAS](#), **478**, [4513](#).
- 2019 Čotar, K., Zwitter, T., Traven, G., **et al.**: The GALAH survey: unresolved triple Sun-like stars discovered by the Gaia mission, MNRAS, [arXiv:1904.04841](#).
- 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, [MNRAS](#), **486**, [1167](#).
- 2019 Žerjal, M., Ireland, M. J., Nordlander, T., **et al.**: The GALAH Survey: Lithium-strong KM dwarfs, MNRAS, [MNRAS](#), **484**, [4591](#).
- 2019 Čotar, K., Zwitter, T., Kos, T., **et al.**: The GALAH survey: a catalogue of carbon-enhanced stars and CEMP candidates, MNRAS, [MNRAS](#), **483**, [3196](#).
- 2019 Simpson, J. D., Martell, S. L., Da Costa, G., **et al.**: The GALAH survey: Co-orbiting stars and chemical tagging, [MNRAS](#), **482**, [5302](#).
- 2019 Khanna, S., Sharma, S., Bland-Hawthorn, J., **et al.**: The GALAH Survey: Velocity fluctuations in the Milky Way using red clump giants, [MNRAS](#), **482**, [4215](#).

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- 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.
- 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.
- 2018 Kos, J., Bland-Hawthorn, J. Betters, C. H., **et al.**: Holistic spectroscopy: Complete reconstruction of a wide-field, multi-object spectroscopic image using a photonic comb, [MNRAS](#), **480**, 5475.
- 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*, accepted, [MNRAS](#), **480**, 5242.
- 2018 Quillen, A. C., De Silva, G. M., Sharma, S., **et al.**: The GALAH Survey: Stellar streams and how stellar velocity distributions vary with Galactic longitude, hemisphere and metallicity, [MNRAS](#), **478**, 228.
- 2018 Duong, L., Freeman, K. C., Asplund, M., **et al.**: The GALAH survey: properties of the Galactic disk(s) in the solar neighbourhood, [MNRAS](#), **476**, 5216.
- 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.
- 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.
- 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.
- 2017 Przybilla, N., Aschenbrenner, P., **Buder, S.**: Candidate exoplanet host HD131399A: a nascent Am star, [A&A](#), **604**, 9.
- 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.
- 2017 Martell, S. L., Sharma, S., **Buder, S.**, et al.: The GALAH survey: observational overview and *Gaia* DR1 companion, [MNRAS](#), **465**, 3203.
- 2017 Mugrauer, M., **Buder, S.**, Reum, F., Birth, A.: The Großschwabhausen binary survey, [AN](#), **338**, 61.
- 2016 Ginski, C., Mugrauer, M., Seeliger, M., **Buder, S.**, et al.: A lucky imaging multiplicity study of exoplanet host stars - II, [MNRAS](#), **457**, 2173.
- 2016 Schmidt, T. O. B., Neuhäuser, R., Briceño, C, **et al.**: Direct Imaging discovery of a second planet candidate around the possibly transiting planet host CVSO 30, [A&A](#), **593**, 75.
- 2016 Fritzewski, D. J., Kitze, M., Mugrauer, M., **et al.**: Long-term photometry of IC 348 with the Young Exoplanet Transit Initiative network, [MNRAS](#), **462**, 2396.
- 2016 Raetz, St., Schmidt, T. O. B., Czesla, S., **et al.**: YETI observations of the young transiting planet candidate CVSO 30 b, [MNRAS](#), **460**, 2834.
- 2016 Garai, Z., Pribulla, T., Hambálek, L., **et al.**: Search for transiting exoplanets and variable stars in the open cluster NGC 7243, [AN](#), **337**, 261.
- 2015 Seeliger, M., Kitze, M., Errmann, R., **et al.**: Ground-based transit observations of the HAT-P-18, HAT-P-19, HAT-P-27/WASP40 and WASP-21 systems, [MNRAS](#), **451**, 4060.

References

Supervisor, *Dr Karin Lind*, MPIA Heidelberg, klind@mpia.de.

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Principal Investigator of GALAH survey, *Prof Dr Joss Bland-Hawthorn*, University of Sydney, jbh@physics.usyd.edu.au.

Director of institute department, *Prof Dr Hans-Walter Rix*, MPIA Heidelberg, rix@mpia.de.