

Sven Buder - Curriculum Vitae

Research Expertise

- Galactic archaeology and stellar spectroscopy with large-scale surveys and high-precision pipelines
- Using stars to connect cosmic scales – from element formation to extragalactic systems
- Bridging observations and theory through comparisons with simulated Milky Way analogues
- Advancing interdisciplinary science via data-driven spectroscopic methods

Professional Appointments

- Since 2023 **DECRA Fellow, Galactic Archaeology & Stellar Physics (Level C)**
Research School of Astronomy & Astrophysics (RSAA) at the Australian National University (ANU)
- 05–09/2023 **Secondment as Research Software Engineer**
Australian Earth System Simulator (ACCESS-NRI), an NCRIS-funded National Research Infrastructure facility to support the modelling & comparison of climate models, Canberra, Australia
- 2019–2022 **Research Fellow, Galactic Archaeology & Stellar Physics (Level B)**
RSAA/ANU & Australian Research Council (ARC) Centre of Excellence ASTRO 3D, Australia

Education

- 2015–2019 **PhD in Astronomy & Astrophysics**, Max-Planck-Institute for Astronomy & University of Heidelberg, Germany, with Profs Karin Lind & Melissa Ness, [PhD Thesis](#) from July 2019
- 2010–2015 **Bachelor & Master of Science in Physics**, Friedrich Schiller University Jena, Germany

Awards & Fellowships

- 2024 ANU Vice-Chancellor's Award for Academic Excellence
- 2023 ARC Discovery Early Career Researcher Award (DE24, 459 000 AUD from the ARC)
- 2023 Louise Webster Prize of the Astronomical Society of Australia (2 500 AUD)
- 2017–2020 German-Australian travel stipend of the Group of Eight UA-DAAD (25 000 AUD as Co-I)

Publications & Impact

- 99 refereed publications in top-tier (Q1) journals. 4 732 citations, h-index of 35 ([Google Scholar](#))
- 9 highest-impact, first-author publications (7 refereed, 2 submitted, full publication list on the [ADS](#)):
 - Buder et al., [2024a](#), [2025b](#), [2025c](#) (MNRAS 7 citations / subm. / subm.): A series of papers to quantify the impact of major mergers in the Milky Way based on cosmological NIHAO simulations.
 - Buder et al. [2025a](#) (OJAp, 3 citations): Revealing non-linear, locally varying metallicity gradients by linking galactic, extragalactic, & simulation expertise.
 - Buder et al. [2024b](#) (PASA, 55 citations): Neural network enabled measurement of 32 elements in nearly 1 million stars from the elements of life CNO to rare heavy elements used in modern electronics.
 - Buder et al. [2022](#) (MNRAS, 95 citations): Chemical tagging of accreted stars in the Milky Way.
 - Buder et al. [2021](#) (MNRAS, 581 citations): Unprecedented catalog of chemical compositions of 600 000 stars accompanied by age & orbit estimates. Most cited paper of the top-tier journal MNRAS in 2021.
 - Buder et al. [2019](#) (A&A, 122 citations): Identifying the best way to dissect Galactic disk populations.
 - Buder et al. [2018](#) (MNRAS, 337 citations): Innovative data-driven spectrum analysis for 340 000 stars.

Research Talks, Seminars, & Workshops

- 19 **Invited Talks**, at *National & International Meetings (since 2017)*
- 15 **Invited Colloquia/Seminars**, at *National & International Institutions (since 2017)*
- 6 **Invited Participations**, at *exclusive International Expert Workshops (since 2016)*
- 17 **Contributed Talks**, at *National & International Conferences (since 2016)*

Mount Stromlo Observatory, Ngunnawal & Ngambri Country, 2611 ACT, Australia

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Research Supervision

I have supervised research projects of 22 students (12 female, 9 male, 1 non-binary) at different levels since 2021, including 12 undergrad students (ASC, ASTR3005, ASTR8001). Primary supervision experience:

- PhD **Anell Victoria Cornejo Cárdenas (ANU)**, *primary supervisor*,
Bridging galaxy evolution with resolved & unresolved spectroscopy, since 2024
- PhD **Yani Lach (ANU)**, *primary*, Stellar evolution with spectroscopic binaries, since 2024
- Honours **Shanti Woodend (ANU)**, *primary*, Chemical evolution of simulated dwarf galaxies, 2025
- Honours **Luka Mijnaerends (ANU)**, *primary*, Chemical enrichment from resolved & unresolved spectroscopy in NGC 6822, 2023
- Honours **Yi (Anne) Xie (ANU)**, *primary*, Stellar abundance irregularities from optical & infrared spectroscopy with GALAH & APOGEE, 2023

Secondary PhD supervisor for Maja Jabłonska (2025–), Patrick O'Connor (2025–), Sarah Aquilina (2024–), Evans Owusu (2021–), Madeleine McKenzie (now Hubble Fellow at Caltech), & Xie (Ella) Wang (now SU).

Teaching

- Lectures & Tutorials** Co-lecturer of ANU ASTR4004 Astronomical Computing (2024), Guest Lectures & tutorials of ASTR4006 Galaxies (2022, 2024) & ASTR2013 Foundations of Astrophysics (2021)
Invited Lectures at the Australia-eROSITA-DE multi-wavelength school (2025, online) and the International School of Space Science (2019, L'Aquila, Italy)

Leadership & Collaboration

- Chair** Survey Management (12 members) & analysis groups of the GALAH survey (60 members)
- Chair** ASTRO 3D's National Early / Mid Career Researcher Committees (2021–2024)
- Member** International Milky Way surveys [GALAH](#) (2015+), [Gaia-ESO](#) (2015–2019), [SDSS-IV](#) (2015–2019), [4MOST](#) (2019+) & extragalactic large MUSE survey [GECKOS](#) (2022+)
- SOC** **Chair:** *ASTRO 3D Science Meeting, Canberra 2021 & Sydney 2024*,
Member *GALAH Science Meeting, 2021 & EWASS 2019 Special Session, Lyon 2019*
- LOC** 5 Conference & Workshop LOCs in Germany & Australia (2013–2022)

Resource Allocation

- Telescopes** **Principle Investigator**, for 123 nights (1.2M AUD) at Siding Spring Observatory (SSO),
Co-Investigator of 525 nights (5.3M AUD) across Australia, Chile, & Germany
- Computing** Parallelised CPU (python & IDL) & GPU computing (python) allocation of 4 Mio. hours (0.3M AUD) across supercomputers in Australia, Germany, & Sweden

Service

- Editor** The Open Journal of Astrophysics (since 2025)
- Inter-national** Time Allocation Committee of the Hubble Space Telescope, Review Panel Member of the Galactic Pipeline of the 300-member 4MOST Survey
- National** Committee member of the Industry Engagement Advisory Committee of Australian Astronomy Limited (AAL, NCRIS, since 2024), Decadal Plan Working Groups (2024), ASTRO 3D ECR Committee (since 2020) & ASTRO 3D EDI Committee (since 2022)
- Institute** PhD Thesis Oversight Committee (since 2024), Inclusion, Diversity, Equity & Access Committee (since 2022), Committee member for Colloquia (2019–2024, chair 2020–21), International PhD Scholarship Selection Committee (2019–2022)
- Referee** Nature, A&A, ApJ, ApJS, PASA, & MNRAS (at least 2 papers per year)
- Outreach** 11 talks throughout Australia (since 2021), incl. ANU Open Days 2022 & 2023
- Press** National TV: [ABC News](#) 2024; National Radio: [SBS German](#) 2025, [ABC News](#) & TripleM 2024, SBS News 2022; Web: [space.com](#) & [Cosmos Magazine](#) 2022, [astronomy.com](#) 2018

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