

Dr. Julia Bodensteiner

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languages: German: native
English: fluent
Spanish: fluent
Dutch: basic



Research Positions

- 2021 - now ESO fellow, European Southern Observatory, Garching, Germany
Independent research fellowship with 20% duty time supporting ESO observatory operations
- 2017-2021 PhD student, Institute of Astronomy, KU Leuven, Belgium
Thesis title: “*Observational imprints of binary evolution on B- and Be-star populations*” [\[PDF\]](#)
- 2015-2017 Student job, Max-Planck Institute for Extraterrestrial Physics, Munich, Germany
Reduction and analysis of spectroscopic FEROS and photometric GROND data

Academic background

- 2015-2017 M.Sc. Nuclear, Particle & Astrophysics, Technical University of Munich
Thesis title: “*Interaction between massive stars and the interstellar medium*”
- 2011-2015 B.Sc. Physics, Technical University of Munich, Germany
including two semesters of ERASMUS stay at the Universidad Complutense de Madrid, Spain

Prizes and awards

- 2023 Travel grant from the ESO Science Support Discretionary Fund – 3000 €
2-month research visit at ESO Vitacura including an observing run at the VLT in Paranal, Chile
- 2022 Springer Thesis Award – 500 €
Publication of my PhD thesis as [monograph](#) in the Springer series for “Outstanding PhD Research”
- 2018 IAU Travel Grant – 250 €
Travel grant “IAU Symposium 351: *Star clusters from the Milky Way to the Universe*” in Italy, 2019

Observing experience

- 2023 ESO-VLT observations with UT1 and UT2, 8 nights
Hands-on training on ESO's *Very Large Telescope (VLT)* using different instruments
- 2018-20 KU Leuven Mercator telescope, 40 nights (incl. 10 remote nights due to Covid-19)
Observations with high-resolution spectrograph *HERMES* and 3-channel photometer *MAIA*
- 2015-16 MPG/ESO-2.2m telescope, 21 nights
Observations with high-resolution spectrograph *FEROS* and multi-band imager *GROND*

Granted observing time since 2017

ESO	> 100h as PI, > 300h as Co-I, incl. 140 h as delegated PI in ESO Large Programme
ORM	> 100 nights as PI and > 50 nights as Co-I with <i>Hermes</i> at the <i>Mercator</i> telescope
others	> 15 h with <i>HST/STIS</i> , <i>XMM</i> , and <i>Gemini/MAROON-X</i> as Co-I

Teaching and supervision

- Co-supervision of a Master thesis at KU Leuven
- ♦ ongoing
 - Mentoring of five PhD students at ESO Garching
 - Mentoring in the context of the [Supernova Foundation](#) mentoring program
 - Invited lecturer at the 1-week [ERASMUS+ Summer School](#) on “*Eclipsing Binaries and Asteroseismology*”, held in September in La Palma, Spain
- ♦ 2022
 - Co-supervision of a research project in the context of the ESO Summer Research Programme 2022
 - Lecturer at the ESO Summer Research Programme 2022
 - Guidance of a high-school student for a short internship at ESO Garching
- ♦ 2021
 - Co-supervision of a Master thesis at KU Leuven
- ♦ 2020
 - Co-supervision of a research project at Master level at KU Leuven
- ♦ 2019
 - Co-supervision of a research project at Master level at KU Leuven
 - Teaching assistant for the course “*High Energy Astrophysics*” at KU Leuven
- ♦ 2018
 - Co-supervision of a Bachelor thesis at KU Leuven
 - Guidance of a high-school student for a short internship at KU Leuven

Project involvement and collaborations

- ♦ [VFTS](#) Collaboration member since 2017
- ♦ [SoXS](#) ESO duty
- ♦ [XshootU](#) ULLYSES and X-Shooter massive star collaboration, Working group 10: Stripped Stars
- ♦ [WST](#) Galactic working group
- ♦ [Arago](#) Working group on BA stars
- ♦ [UVEX](#) Working group: The Low-mass Galaxy Frontier (Magellanic Clouds)

Conferences and workshops

- ♦ Aug 2023 2-week MIAPP workshop: “Stellar Astrophysics in the Era of Gaia, spectroscopic and asteroseismic surveys
- ♦ Jul 2023 3, 2, 1: Massive Triples, Binaries and Mergers 2023 (Leuven, Belgium)
Invited talk: “*Multiplicity properties of massive star populations*”
- ♦ Jun 2023 Lorentz Workshop: “The Renaissance of Stellar Black-Hole Detections in the Local Group” (Leiden, The Netherlands)
Invited review talk: “*Black hole impostors*”
- ♦ May 2023 Black Holes and Gravitational Waves Day (MPA Garching, Germany)
Contributed talk: “*The early life of gravitational wave sources - detecting intermediate phases in double-compact object formation*”
- ♦ Mar 2023 16th annual meeting of the VFTS collaboration (MPA Garching, Germany)
Contributed talk: “*ERIS observations of the core of R136*”
- ♦ Mar 2023 First UVEX Community Workshop: Synergies and New Opportunities (online)
- ♦ Nov 2022 IMBASE 2022: The Impact of Binaries on Stellar Evolution (Munich, Germany)
Invited talk: “*Multiplicity properties of massive star populations*”
- ♦ Nov 2022 4-week MIAPP workshop: The fundamental role of stellar multiplicity in stellar dynamics and evolution
Discussion session: “*The possible binary origin of classical Be stars*”
- ♦ Jun 2022 15th annual meeting of the VFTS collaboration (HITS Heidelberg, Germany)
Contributed talk: “*Searching for binary interaction products in the Magellanic Clouds with MUSE*”
- ♦ May 2022 IAUS 361: Massive stars near and far (Ballyconnal, Ireland)
Poster: “*Near and far: a hunt for binary interaction products*”
- ♦ Oct 2021 sdOB workshop (Max-Planck Institute for Astrophysics, Garching, Germany)
Contributed talk: “*The possible binary origin of classical Be stars and their connection to subdwarfs*”
- ♦ Jul 2021 European Week of Astronomy 2021 (virtual)
Invited talk: “*On the origin of classical Be stars and the nature of exotic Be binary systems*”
- ♦ Jul 2020 MOBSTER-1 Conference (virtual)
Contributed talk: “*On the binary origin of Be stars and the nature of exotic Be binary systems*”
- ♦ Jun 2020 European Week of Astronomy 2020 (virtual)
Contributed talk: “*Hunting for post-interaction stars: A MUSE adaptive optics view of the SMC cluster NGC 330*”
- ♦ Jun 2019 European Week of Astronomy 2019 (Lyon, France)
Contributed talk: “*Hunting for binary interaction products in the SMC cluster NGC 330 with MUSE*”
- ♦ May 2019 IAUS351: Star Clusters from the Milky Way to the Early Universe (Bologna, Italy)
Poster: “*A MUSE view of the massive star population in the SMC cluster NGC 330*”
- ♦ Nov 2018 Massive stars and supernovae (Bariloche, Argentina)
Contributed Talk: “*A MUSE adaptive optics view of the SMC cluster NGC 330*”
- ♦ Apr 2018 11th annual meeting of the VFTS collaboration (La Laguna, Spain)
Talk: “*IR nebulae around massive stars as indicators for binary interactions*”
- ♦ Jul 2017 The impact of binaries on stellar evolution (Munich, Germany)
Poster: “*Interactions between massive stars and the interstellar medium*”

Seminars and talks

- ♦ Nov 2023 Centro de Astrobiología Seminar, Madrid, Spain
Invited Seminar: *"To Be or not to Be: the possible binary origin of classical Be stars"*
- ♦ Nov 2023 Astrophysics Research Seminar, Liverpool John Moores University, UK
Invited Seminar: *"To Be or not to Be: the possible binary origin of classical Be stars"*
- ♦ July 2023 Kavli Summer School (Max-Planck Institute for Astrophysics, Germany)
Invited Talk: *"Be stars and their companions"*
- ♦ May 2023 Celebrating 25 years of VLT First Light (ESO, Garching, Germany)
Invited Talk: *"Degenerate Stars – ER 8: A very low luminosity degenerate star"*
- ♦ April 2023 Wine & Cheese seminar (ESO, Garching, Germany)
Talk: *"Investigating HD 93683 – an enigmatic massive multiple system"*
- ♦ Mar 2023 ESO Informal Discussion (ESO, Garching, Germany)
Talk: *"How star clusters can help to find binary interaction products"*
- ♦ Jan 2023 Joint ESO/ALMA colloquium (ESO, Vitacura, Chile)
Invited Seminar: *"Searching for binary interaction products in the Magellanic Clouds with MUSE"*
- ♦ Sep 2022 Pizza seminar (Anton Pannekoek Institute in Amsterdam, The Netherlands)
Invited Talk: *"On the possible binary origin of Be stars"*
- ♦ Jun 2022 SESTAS Star Cluster Meeting (Max-Planck Institute for Astrophysics, Germany)
Talk: *"Searching for binary interaction products in the Magellanic Clouds with MUSE"*
- ♦ May 2022 Stellar Group Meeting (Observatory of Geneva, Switzerland, virtual)
Invited Seminar: *"On the possible binary origin of Be stars and the nature of exotic Be binaries"*
- ♦ Nov 2021 SESTAS Meeting (Max-Planck Institute for Astrophysics, Garching, Germany)
Talk: *"Dissecting the core of the SMC cluster NGC 330 with MUSE"*
- ♦ Jul 2021 IAU Working Group on Active B Stars Talk series (virtual)
Invited Seminar: *"On the possible binary origin of classical Be stars"*
- ♦ Jul 2021 Sheffield Astronomy Seminar (University of Sheffield, UK, virtual)
Invited Talk: *"On the binary origin of classical Be stars"*
- ♦ May 2021 SeBa and binary stellar evolution meeting (virtual)
Invited Talk: *"On the binary origin of Be stars and the nature of exotic Be binary systems"*
- ♦ Jun 2021 Journal Club (Liverpool John Moores University, UK, virtual)
Invited Talk: *"The young massive SMC cluster NGC 330 seen by MUSE"*
- ♦ Feb 2021 Massive Star meeting (Anton-Pannekoek Institute, The Netherlands, virtual)
Talk: *"A MUSE adaptive optics view of NGC 330: Hunting for post-interaction binaries"*
- ♦ Jan 2021 BigBoom meeting (University of Arizona, US, virtual)
Talk: *"On the binary origin of Be stars and the nature of exotic Be binary systems"*
- ♦ Jul 2020 BinCosmos meeting (Harvard University, US, virtual)
Invited Talk: *"On the binary origin of Be stars and the nature of exotic Be binary systems"*
- ♦ Jul 2020 Potsdam Zoominar (Potsdam University, Germany, virtual)
Invited Talk: *"A MUSE adaptive optics view of NGC 330: Hunting for post-interaction stars"*
- ♦ Jun 2020 Compact Objects Meeting (Flatiron Institute New York, US, virtual)
Invited Talk: *"Is HR 6819 a triple system containing a black hole? An alternative explanation"*
- ♦ Apr 2019 Institute of Astronomy Seminar Series (KU Leuven, Belgium)
Talk: *"The core of NGC 330 seen with MUSE"*

Organizational experience and community service

- Co-chair of the conference “*Two in a million – The interplay between binaries and star clusters*”, ESO Garching, 11-15 September, 2023
 - Co-organizer of the *ESO Summer Research Programme 2023*
 - Co-organizer of the 16th annual meeting of the VFTS collaboration
 - Co-organizer of the “Journal Club”, the “Informal Discussion”, and the “Astronomy for non-Astronomers” talk series at ESO
- ♦ ongoing
 - Representative of the fellows at ESO Garching
 - Scientific referee for Nature Astronomy, A&A, ApJ, MNRAS, Astronomische Nachrichten and Galaxies
 - HST Cycle 31 Expert External Reviewer for Large/Treasury and highly conflicted proposals
 - Member of the ESO Harassment Investigation Panel
 - Subject-matter expert reviewer in a NASA peer review
- ♦ 2022
 - Keeper of the minutes of the ESO Scientific and Technical Committee meeting
 - Assistant organizer of the *ESO Summer Research Programme 2022*
- ♦ 2021
 - Selection committee for the “*ESO Hypatia colloquium 2022*”
 - Scientific assistant in ESO time allocation panel
- ♦ 2019-2021
 - Organizer of the weekly PhD meeting at the Institute of Astronomy, KU Leuven

Public outreach

- ♦ ongoing
 - Co-organizer of the “*Pint of Science*” festival Munich, Germany
 - Several virtual “*Skype a Scientist*” sessions around the world
 - Invited public talk in “*NASA’s Universe of Learning*” series
 - Interview in “*Space Night Science*” aired in German TV
 - Public talk in the “*Faszination Astronomie online*” series (> 11 000 views)
 - Interview in Podcast “*Melangetalk*”
 - Co-organizer of the *ESO Girl’s Day 2023, 2022*
- ♦ previous
 - “*Science Figured Out*” – 2min video pitch
 - Video contribution to the exhibition “*To the Edge of Time*”, Leuven, Belgium
 - Virtual talk to German high-school class (12th grade)
 - Several virtual “*Skype a Scientist*” sessions around the world
 - “*Couch of Science*” virtual public talk on *youtube*
 - Public talk in a bar in the context of the “*Pint of Science*” festival

Publication List

Over 30 First- and co-author publications with almost 700 citations, h-index: 16

First Author Publications

Monographs:

- 1 Bodensteiner 2022, Springer Theses, Springer Cham, doi [10.1007/978-3-031-19489-4](https://doi.org/10.1007/978-3-031-19489-4)
Observational Imprints of Binary Evolution on B- and Be-star Populations

Research articles: 6 peer-reviewed publications with > 185 citations

- 2 Bodensteiner, Sana, Dufton et al. 2023, A&A in press, [arXiv:2308.14799](https://arxiv.org/abs/2308.14799) (1 citation)
MUSE observations of the young massive SMC cluster NGC 330. III. Stellar parameters and rotational velocities
- 3 Bodensteiner, Sana, Wang et al. 2021, [A&A 652, A70](#) (24 citations)
MUSE observations of the young massive SMC cluster NGC 330. II. Multiplicity properties of the massive star population
- 4 Bodensteiner, Shenar, Mahy et al., 2020, [A&A, 641, A43](#) (69 citations)
Is HR 6819 a triple system containing a black hole? - An alternative explanation
- 5 Bodensteiner, Shenar, Sana, 2020, [A&A, 641, A42](#) (48 citations)
On the lack of main-sequence companions to Be stars
- 6 Bodensteiner, Sana, Mahy et al. 2020, [A&A 634, A51](#) (30 citations)
MUSE observations of the young massive SMC cluster NGC 330. I. Observations and stellar content
- 7 Bodensteiner, Baade, Greiner, Langer 2018, [A&A 618, 110](#) (17 citations)
IR nebulae around bright massive stars as indicators for binary interactions

Others: 2 ESO Messenger Articles and 2 Gamma-ray Coordination Network (GCN) Circulars

- 8 Bodensteiner, Kaasinen, Berton 2023, [Messenger 191, 58](#)
Fellows at ESO
- 9 Bodensteiner, Heida, Abdul-Masih et al. 2022, [Messenger 186, 3](#) (3 citations)
Detecting Stripped Stars While Searching for Quiescent Black Holes
- 10 Bodensteiner, Knust, Schweyer, Greiner, [GCN Circular Service, No. 19375, 2016](#)
GRB 160501A: GROND observation
- 11 Bodensteiner, Schmidl, Greiner, [GCN Circular Service, No. 19349, 2016](#)
GRB 160425A: GROND observation

Co-Author

Invited reviews:

- 1 Marchant & Bodensteiner 2023, Annual Review of A&A, in press, [arXiv:2311.01865](#)
The Evolution of Massive Binary Stars

Research articles: 29 co-authored publications with over 500 citations

- 2 Vigna-Gómez, Willcox, ..., Bodensteiner et al. 2023, submitted, [arxiv:2310.01509](#)
Observational evidence for neutrino natal kicks from black-hole binary VFTS 243
- 3 Villaseñor, Lennon, ..., Bodensteiner et al. 2023, [MNRAS 525, 5121](#)
The B-type Binaries Characterisation Programme II. VFTS 291: A stripped star from a recent mass transfer phase
- 4 Zak, Jones, ..., Bodensteiner et al. 2023, [MNRAS 524, 5749](#)
Everything that glitters is not gold: V1315 Cas is not a dormant black hole
- 5 Janssens, Shenar, Degenaar, Bodensteiner et al. 2023, [A&A 677, 12](#) (3 citations)
MWC 656 is unlikely to contain a black hole
- 6 Shenar, Wade, ..., Bodensteiner et al. 2023, [Science 381, 761](#) (3 citations)
A massive helium star with a sufficiently strong magnetic field to form a magnetar
- 7 Vink, Mehner, ..., Bodensteiner et al. 2023, [A&A 675, 154](#) (10 citations)
X-Shooting ULLYSES: massive stars at low metallicity. I. Project Description
- 8 Banyard, Mahy, Sana, Bodensteiner et al. 2023, [A&A 674, 60](#) (2 citations)
Searching for compact objects in the single-lined spectroscopic binaries of the young Galactic cluster NGC 6231
- 9 Saracino, Shenar, ..., Bodensteiner et al. 2023, [MNRAS 521, 3162](#) (9 citations)
Updated radial velocities and new constraints on the nature of the unseen source in NGC1850 BH1
- 10 Greiner, Maitra, ..., Bodensteiner et al. 2023, [Nature, 615, 605](#) (4 citations)
A helium-burning white dwarf binary as a supersoft X-ray source
- 11 Wang, Hastings, ..., Bodensteiner et al. 2023, [A&A 670, A43](#) (3 citations)
The initial spin distribution of B-type stars revealed by the split main sequences of young star clusters
- 12 Mahy, Sana, ..., Bodensteiner et al. 2022, [A&A, 664, A159](#) (24 citations)
Identifying quiescent compact objects in massive Galactic single-lined spectroscopic binaries
- 13 Shenar, Sana, ..., Bodensteiner et al. 2022, [Nature Astronomy, 6, 1085](#) (35 citations)
An X-ray quiet black hole born with a negligible kick in a massive binary within the Large Magellanic Cloud
- 14 Hennicker, Kee, Shenar, Bodensteiner, et al. 2022, [A&A 660, A17](#) (4 citations)
Binary-object spectral-synthesis in 3D (BOSS-3D) - Modelling H-alpha emission in the enigmatic multiple system LB-1
- 15 Frost, Bodensteiner, Rivinius et al. 2022, [A&A 659, L3](#) (18 citations)
HR 6819 is a binary system with no black hole – Revisiting the source with infrared interferometry and optical integral field spectroscopy
- 16 Wang, Langer, ..., Bodensteiner et al. 2021, [Nature Astronomy 6, 480](#) (24 citations)

Stellar mergers as the origin of the blue main-sequence band in young star clusters

- 17 Rainot, Reggiani, Sana, **Bodensteiner**, Absil 2021, [A&A 658, A198](#) (5 citations)
The Carina High-Contrast Imaging Project for massive Stars (CHIPS) II. O stars in Trumpler 14
- 18 Pavlovski, Hummel, ..., **Bodensteiner** et al. 2021, [A&A 658, A92](#) (8 citations)
Dynamical parallax, physical parameters and evolutionary status of the components of the bright eclipsing binary α Draconis
- 19 Banyard, Sana, Mahy, **Bodensteiner** et al. 2022, [A&A, 658, 69](#) (34 citations)
The observed multiplicity properties of B-type stars in the Galactic young open cluster NGC 6231
- 20 Mehner, Janssens, ..., **Bodensteiner** et al. 2021, [A&A, 655, A33](#) (1 citation)
LBV phenomenon and binarity: The environment of HR Car
- 21 Gebruers, Straumit, ..., **Bodensteiner**, [A&A, 650, A151](#) (14 citations)
A homogeneous spectroscopic analysis of a Kepler legacy sample of dwarfs for gravity-mode asteroseismology
- 22 Janssens, Shenar, Mahy, Marchant, Sana, **Bodensteiner**, 2020, [A&A, 646, 33](#) (8 citations)
BAT99 126: a Wolf-Rayet multiple system in the Large Magellanic Cloud hosting a massive near-contact binary
- 23 Rainot, Sana, Reggiani, **Bodensteiner** et al. 2020, [A&A, 640, A15](#) (12 citations)
The Carina High-Contrast Imaging Project for massive Stars (CHIPS) I. Methodology and proof of concept on QZ Car (= HD93206)
- 24 Shenar, **Bodensteiner**, Abdul-Masih et al. 2020, [A&A, 639, L6](#) (82 citations)
The hidden companion in LB-1 unveiled by spectral disentangling
- 25 Langer, Schürmann, ... , **Bodensteiner** et al. 2020, [A&A 638, A39](#) (71 citations)
Properties of OB star-black hole systems derived from detailed binary evolution models
- 26 Abdul-Masih, Banyard, **Bodensteiner**, 2020, [Nature 580, 7805](#) (63 citations)
No signature of the orbital motion of a putative 70 solar mass black hole in LB-1
- 27 Patrick, Lennon, Evans, Sana, **Bodensteiner** et al. 2020, [A&A 635, A29](#) (13 citations)
The Multiplicity of the Red Supergiant Population in the Young Massive Cluster NGC 330
- 28 Langer, Baade, **Bodensteiner** et al. 2020, [A&A 633, 15](#) (30 citations)
 γ Cas stars: Normal Be stars with disks impacted by the wind of a helium-star companion?
- 29 Kriss, Mehdipour, Kaastra, Rau, **Bodensteiner** et al. 2019, [A&A 621, 12](#) (19 citations)
HST/COS observations of the newly discovered obscuring outflow in NGC 3783
- 30 Gvaramadze, Kniazev, Bestenlehner, **Bodensteiner** et al. 2015, [MNRAS 454, 219](#) (20 citations)
The blue supergiant MN18 and its bipolar circumstellar nebula