

CONTACT INFORMATION	Steward Observatory, 933 N Cherry Ave, Tucson, AZ 85719 ksen@arizona.edu	+1 520 738 2300 senkoushik1995@gmail.com
RESEARCH INTERESTS	Massive binary and stellar evolution: stellar winds, internal mixing processes, tides, X-ray binaries, stripped-envelope supernovae, gravitational wave progenitors	
EMPLOYMENT	University of Arizona , Tucson, USA Jan 2025 - present Research associate, Department of Astronomy, Steward Observatory Nicolaus Copernicus University in Torun , Poland Nov 2022 - Dec 2024 Research Adjunct, Faculty of Physics, Astronomy and Informatics	
EDUCATION	Argelander Institute for Astronomy , Bonn, Germany Ph.D. in Natural Sciences, Astronomy and Astrophysics, September 27 2022 - Grade: 1.3/4.0 (1.0 - highest, 4.0 - lowest, in steps of 0.3) - Thesis: <i>Evolution of short-period massive binaries in the Magellanic Clouds</i> - Advisor: Prof. Dr. Norbert Langer Indian Institute of Technology, Kharagpur , West Bengal, India Integrated Bachelors and Masters in Science, Physics, July 2018 - GPA: 9.65/10, Institute Silver Medalist - Masters thesis: <i>Modelling and evolution of supernova remnants</i> - Advisor: Prof. Somnath Bharadwaj Sri Aurobindo Institute of Education , Kolkata, India High School, I.S.C., Mathematics, Physics, Chemistry and English, June 2013 - Percentage marks: 95.25% - IIT JEE: All India Rank: 4958.	
STANDARD TESTS	GRE General: Score - 332/340; <i>Physics:</i> Score - 980/990;	Dec 2017
RESEARCH EXPERIENCE - UNDERGRADUATE	Topic: Laser transmission through fibre at low wavelength (UV) range Laser Spectroscopy Group, May 2018 to July 2018 Max Planck Institute for Quantum Optics, Garching, Germany Supervisor: Prof Dr Thomas Udem; in the group of Prof Dr T. W. Haensch Topic: Short-term variability in magnetized massive stars: contribution from unstable magnetosonic waves. Astronomy and Astrophysics Division, May 2017 to July 2017 University of Alberta, Edmonton, Canada Supervisor: Rodrigo Fernandez, Associate Professor Topic: The cooling zones of shocks in the winds of massive stars. Astronomy and Astrophysics Division, May 2016 to July 2016 University Observatory Munich, Ludwig Maximilian University, Munich, Germany Supervisor: Joachim Puls, Professor Topic: Encoding information in the phases of qubits. Physical Sciences Division, December 2014, May 2015 to July 2015 Indian Institute of Science, Education and Research, Kolkata, Kalyani, India Supervisor: Prof Dr Prasanta K. Panigrahi, Professor Topic: Chaotic Oscillations of a current carrying coil in a magnetic field. Plasma Physics Division, May 2014 to July 2014 Saha Institute of Nuclear Physics, Kolkata, India Supervisor: A. N. Sekar Iyengar, Emeritus Professor	

AWARDS	Grants won by my student, Deekshitha Alladi, at the University of Arizona	
	• Galileo Circle Scholarship ~1000 USD	2026
	• Exploratory Mini-Grant, W.A. Franke Honors College ~4000 USD	2025
	Research grants	
	• PI - HST Cycle 33 Prog ID - 18115. ~43,676 USD	2025
	Travel Grants - International	
	• IAU Travel Grant - IAU General Assembly, Cape Town, SA. ~600 EUR	2024
	• AG Travel Grant - German Astronomical Society, Germany. ~500 EUR	2022
	• APS Distinguished Student (DS) Program. ~2000 USD	2018
	• (UARE) Scholarship, University of Alberta, Canada. ~6000 CAD	2017
REFeree/ REVIEWER	• DAAD WISE Scholarship, Germany. ~2000 EUR	2016
	Graduation - IIT Kharagpur	
	• Institute Silver Medal.	2018
	• Nilanjan Ganguly Memorial Award, Kedarnath Singh Memorial Award, H.N. Bose Memorial Award, G.B. Mitra Award. Total ~20 000 INR	
	Undergraduate National Fellowships - India	
	• Inspire Fellow, Dept. of Science and Technology, India. ~300 000 INR	2013-2018
	• National Initiative on Undergraduate Sciences (NIUS) Fellow	2013-2014
	Telescopes	
	• Hubble Space Telescope (HST) - Cycle 33 & 34 Stellar Physics Panellist	
	• ESO Very Large Telescope (VLT) - P114 Distributed Peer Reviewer	
COMPETITIVE TELESCOPE TIME RECEIVED	Journals	
	• The Astrophysical Journal (ApJ) - Refereed 3 articles	
	• Astronomy and Astrophysics (A&A) - Refereed 5 articles	
	• Publications of the Astronomical Society of the Pacific (PASP) - Star Reviewer	
	NOIRLab, Gemini Observatory	
	• (PI) GHOST, Prop. Nr. 274432, 2026B, time: 40 hrs	2026
	NASA, James Webb Space Telescope	
	• (co-I) NIRCам MIRI, Prop. Nr. 11424, Cycle 5, time: 7.4 hrs	2026
	NASA, Hubble Space Telescope	
	• (PI) MAMA E140M, Prop. Nr. 18115, Cycle 33, total orbits: 6	2025
SCIENTIFIC COLLABORATIONS	European Space Agency (ESA), XMM-Newton	
	• (PI) EPIC pn, Prop. Nr. 096343, AO24, Priority C, time: 54 ks	2025
	European Southern Observatory (ESO), Very Large Telescope (VLT)	
	• (co-I) XSHOOTER, Prog ID: 117.2A9F, total observing time: 7.25 hrs	2026
	• (co-I) FEROS, Prog ID: 114.27SV, total observing time: 92 hrs	2025
	• (PI) UVES, Prog ID: 114.27G8, total observing time: 10 hrs	2024
	• (co-I) FEROS, Prog ID: 113.26Y5, total observing time: 76 hrs	2024
	• (co-I) FLAMES, Prog ID: 112.25R7, total observing time: 117 hrs	2023
	• Stable Mass Transfer Enthusiasts . Flatiron Institute, CCA	2025-present
	• The BLOeM survey . PI: Tomer Shenar, Julia Bodensteiner	2024-present
WORKSHOPS	• Stellar-Mass Black Holes at the Nexus of Optical, X-ray, and Gravitational Wave Surveys , KITP, UCSB, USA	
	• Stable Mass Transfer 2.0 Workshop , Flatiron Institute, USA	Oct 26-Nov 22 2025 May 27-30, 2025

Invited reviews at conferences and workshops

- [StellarBH workshop, KITP, UCSB, USA](#) - “High energy observations of black holes.” November 12, 2025
- [Binary Stars in the Space Era, Keele, UK](#) - “Binary interactions.” July 2, 2025

Invited seminars at Universities - slides [here](#)

- [Astronomy Tea talk, Caltech](#) - “The Algol Renaissance” May 11, 2026
- [KU Leuven](#) - “X-ray emission from black hole binaries” April 28, 2026
- [SO/NSF NOIRLab Joint Colloquium Series, Tucson](#) - “Binary interactions” Feb 05, 2026
- [FLASH Talk, NOIRLab, Tucson](#) - “X-ray emission from black holes in orbit with helium stars” May 16, 2025
- [Astronomical Observatory of the Jagiellonian University, Krakow](#) - “The renaissance of Algol binaries” weekly seminar - April 12, 2024
- [Inter-University Centre for Astronomy and Astrophysics](#) - “Massive Algols as whetstones for binary star evolution towards GW sources.” Weekly seminar of the Institute - October 26, 2023
- [Tata Institute for Fundamental Research](#) - “Observable properties of massive interacting binaries on the main sequence.” Weekly seminar of the Department of Astronomy and Astrophysics - October 10, 2023
- [Indian Institute of Technology, Kharagpur](#) - “Observable properties of massive Algol binaries.” Department of Physics - October 3, 2023
- [Jagiellonian University, Kraków](#) - “Evolution of short-period massive binary stars in the Magellanic Clouds.” Astrophysics seminar of the Faculty of Physics, Astronomy and Applied Computer Science - April 5, 2023
- [Institute of Astronomy, Nicolaus Copernicus University, Toruń](#) - “Evolution of short-period massive binary stars in the Magellanic Clouds.” Seminar of the Faculty of Physics, Astronomy and Informatics - October 10, 2022

Contributed talks - slides & some videos recordings [here](#)

- [ASU Spring 2026 Workshop on Multimessenger Astronomy](#) - Phoenix, Arizona - “X-ray emission from black hole binaries.” May 15, 2026
- [IAU Symposium 402](#) - Ensenada, Mexico - “Empirical constraints on mass transfer physics from massive Algol binaries.” September 18, 2025
- [EAS 2025, Session SS37](#) - Cork, Ireland - “X-ray emission from stripped helium star+black hole binaries.” June 25, 2025
- [EAS 2025, Session S5](#) - Cork, Ireland - “Empirical constraints on mass transfer physics from massive Algol binaries.” June 26, 2025
- [IAU Symposium 398, MODEST 25](#) - Seoul, South Korea - “X-ray emission from helium star+black hole binaries.” June 19, 2025
- [e-Rosita Meeting: from stars to Cosmology](#) - Garching, MPE, MPG - “Whispering in the dark: X-ray faint BHs around OB stars.” Sept 20, 2024
- [VFTS Meeting](#) - Madrid, ESA, Spain - “Faint X-ray emission from black holes with OB star companions.” Sept 16, 2024
- [Galactic and extragalactic X-ray transients, theory and observational perspectives](#) - Warsaw, Poland - “X-ray faint BHs around OB stars.” Sept 11, 2024
- [MODEST 24](#) - Warsaw, Poland - “Whispering in the dark: X-ray faint BHs around OB stars.” Aug 22, 2024
- [IAU General Assembly - Div G: Stars and Stellar Physics](#) - Cape Town - “Observable properties of massive Algols.” Aug 12, 2024
- [IAU 389 — Gravitational Wave Astrophysics](#) - Cape Town - “Massive Algols as whetstones for the progenitors gravitational wave sources.” Aug 6, 2024
- [LIAC41: The eventful life of massive star multiples](#) - Liege - “Observable properties of Algol binaries across the Hertzsprung-Russell diagram.” July 16, 2024
- [3,2,1: Massive Triples, Binaries and Mergers](#) - KU Leuven - “Observable consequences of interactions in massive main sequence binaries.” July 18, 2023
- [EAS Annual meeting](#) - Krakow - “Reverse Algols and hydrogen-rich Wolf-Rayet stars from massive binary evolution.” July 11, 2023
- [The Wolf-Rayet phenomenon in the Universe](#) - Mexico - “Hydrogen-rich Wolf-Rayet stars on the main sequence from massive binaries.” June 19, 2023

- [AG 2022](#): “Nuclear-timescale reverse Algol evolution and hydrogen-rich Wolf-Rayet stars from very massive binaries.” September 15, 2022
 - [SuperVirtual-2021 - From Common to Exotic Transients](#) - “Compact object progenitors and their companions on the HR diagram.” November 15, 2021
 - MPA-NBIA Gravitational Wave Astrophysics Workshop, Garching - “Detailed models of interacting short-period massive binary stars as progenitors of gravitational wave sources.” November 9, 2021
 - [AG 2021](#): “X-ray emission from BH + O star binaries expected to descend from the observed galactic WR + O binaries.” September 15, 2021
 - [AG 2020](#): “Case A mass transfer: A comprehensive study of their observable stellar properties.” September 24, 2020
 - [APS April Meeting - “From Quarks to Cosmos”](#): “Variability in winds of magnetic massive stars: effect of unstable magnetosonic modes.” April 15, 2018
- Outreach talks** - slides & some videos recordings [here](#)
- [Space Drafts, AOT Tucson](#) - “Batman and eclipsing binaries.” May 20, 2025

SOC/LOC OF CONFERENCES

1. SOC - Binary Stars Session, National Astronomy Meeting 2026, University of Birmingham, UK 20-24 July 2026

TEACHING EXPERIENCE

1. **Guest Lecturer**, Graduate astronomy program at the University of Arizona
 - X-ray emission from black holes Winter semester 2025
Instructor: Brittany Miles, Assistant Professor
 - Massive binary star evolution Summer semester 2025
Instructor: Mathieu Renzo, Assistant Professor
2. **Guest Lecturer**, Masters course at the Nicolaus Copernicus University
 - Introduction to binary stars Summer semester 2024
Instructor: Dorottya Szecsi, Nicolaus Copernicus University in Torun
3. **Tutor**, Masters courses at the University of Bonn
 - Stellar Nucleosynthesis Summer semester 2021
 - Stellar Structure and Evolution Winter semester 2020
Instructor: Norbert Langer, Argelander Institute for Astronomy
 - Programming in Python Summer semester 2020
Instructor: Thomas Erben, Argelander Institute for Astronomy

PUBLICATIONS

ADS links: [First-authored publications here](#) **and** [all publications here](#)

First-authored publications – ORCID ID: [0000-0002-8134-4854](#)

1. Sen, K., M. Renzo, et al. (2026), ApJ, 1000, 2
2. Sen, K., A. Olejak, & S. Banerjee (2025), A&A, 696, A54
3. Sen, K., I. El Mellah, et al. (2024), A&A, 690, A256
4. Sen, K., N. Langer, et al. (2023), A&A, 672, A198
5. Sen, K., N. Langer, et al. (2022), A&A, 659, A98
6. Sen, K., X.-T. Xu, et al. (2021), A&A, 652, A138
7. Sen, K., R. Fernández, & A. Socrates (2018), MNRAS, 477, 2286

Student-led publications

1. **Shah, N.**, M. Renzo, K. Sen, et al. (2026), arXiv: 2602.12327

Co-authored publications

1. Renzo, M., et al. (2026), arXiv, 2606.21824
2. Van Son, L., et al. (2026), arXiv, 2605.31290

3. Menon, A., et al. (2026), A&A, 705, A43
4. Xu, X.-T., et al. (2025), A&A, 704, A218
5. Sana, H., et al. (2025), NatAs, 9, 1337
6. Villaseñor, J., et al. (2025), 2025, A&A, 698, A41
7. Britavskiy, N., et al. (2025), A&A, 698, A40
8. Patrick, L., et al. (2025), 2025A&A, 698, A39
9. Bodensteiner, J., et al. (2025), A&A, 698, A38
10. Schürmann, C., et al. (2024), A&A, 690, A282
11. Shenar, T., et al. (2024), A&A, 690, A289
12. Belczynski, K., et al. (2024), A&A, 690, A21
13. Sana, H., et al. (2024), IAUS, 361, 267
14. Banyard, G., et al. (2023), A&A, 674, A60
15. Shenar, T., et al. (2022), A&A, 665, A148
16. Mahy, L., et al. (2022), A&A, 664, A159
17. Shenar, T., et al. (2022), NatAs, 6, 1085
18. Mahy, L., et al. (2021), mobs.conf, 55
19. Menon, A., et al. (2021), MNRAS, 507, 5013
20. Puls, J., et al. (2020), A&A, 642, A172
21. Langer, N., et al. (2020), A&A, 638, A39

REFERENCES

- **Prof Dr Norbert Langer**, PhD supervisor, Argelander Institute for Astronomy, nlanger@uni-bonn.de
- **Prof Dr Hugues Sana**, collaborator, KU Leuven, hugues.sana@kuleuven.be
- **Prof Dr Dorottya Szecsi**, postdoc supervisor, Nicolaus Copernicus University in Torun, dorottya@umk.pl
- **Prof Dr Mathieu Renzo**, postdoc supervisor, Steward Observatory, University of Arizona, mrenzo@arizona.edu