

Dr. Koushik Sen

CONTACT INFORMATION Zygmunt Krasinski 117/3, 87-100 Toruń, Poland +48 516 532 225
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RESEARCH INTERESTS Stellar Astrophysics: Massive binary and stellar evolution, internal mixing processes, stellar winds, radiation magneto-hydrodynamics, star cluster evolution
High Energy Astrophysics: high mass X-ray binaries, compact object binaries, gravitational waves, stripped-envelope supernovae, supernova remnants

EDUCATION **Argelander Institute for Astronomy**, Bonn, Germany

Ph.D., Astronomy and Astrophysics, September 27 2022

- Grade: *Magna cum Laude*
- Thesis Topic: *Evolution of short-period massive binaries in the Magellanic Clouds*
- Advisor: Prof. Dr. Norbert Langer

Indian Institute of Technology, Kharagpur, West Bengal, India

B.Sc. and M.Sc., Physics, July 2018

- GPA: 9.65/10
- Masters thesis Topic: *Modelling and evolution of supernova remnants*
- Advisor: Prof. Somnath Bharadwaj, Head of Center for Theoretical Studies.

Sri Aurobindo Institute of Education, Kolkata, India

High School, I.S.C., Mathematics, Physics, Chemistry and English, June 2013

- Percentage marks: 95.25%
- JEE (Advanced): All India Rank: 4958. Top 0.01 percentile.

STANDARDISED TESTS

- **GRE General:** Score - 332/340; Year - 2017
- **GRE Physics:** Score - 980/990; Year - 2017
- **TOEFL iBT:** Score - 108/120; Year -2017

RESEARCH EXPERIENCE **Topic: Laser transmission through fiber at low wavelength (UV) range**
Laser Spectroscopy Group, May 2018 to July 2018
Max Planck Institute for Quantum Optics, Garching, Germany
Supervisor: Thomas Udem; in the group of Prof. 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, Assistant 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: Prasanta K. Panigrahi, Director
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, Senior Professor

AWARDS	Travel Grants - International	
	• APS Distinguished Student (DS) Program	2018
	• University of Alberta Research Experience (UARE) Scholarship, Canada	2017
	• DAAD WISE Scholarship, Germany	2016
	Institute Medals - IIT Kharagpur	2018
	• Silver Medalist	
	• Nilanjan Ganguly Memorial Award	
	• Kedarnath Singh Memorial Award	
	• H.N. Bose Memorial Award	
	• G.B. Mitra Award	
	Undergraduate National Fellowships - India	
	• National Initiative on Undergraduate Sciences (NIUS) Fellow	2013-2014
	• Inspire Fellow, Dept. of Science and Technology, India	2013-2018
	Co-curricular	
	• Silver medalist - Inter-hall football - IIT Kharagpur	2015-2016
	• 5th - Kgpiian Game Theory Competition - IIT Kharagpur	2013-2014
PRESENTATIONS	Jageillonian University, Kraków - Astrophysics seminar of the Faculty of Physics, Astronomy and Applied Computer Science -	
	• Invited talk : “Evolution of short-period massive binary stars in the Magellanic Clouds.”	April 5, 2023
	Institute of Astronomy, Nicolaus Copernicus University, Torún - Seminar of the Faculty of Physics, Astronomy and Informatics -	
	• Invited talk : “Evolution of short-period massive binary stars in the Magellanic Clouds.”	October 10, 2022
	SuperVirtual-2021 - From Common to Exotic Transients -	
	• Contributed talk : “Compact object progenitors and their companions on the Hertzsprung-Russell diagram.”	November 15, 2021
	MPA-NBIA Gravitational Wave Astrophysics Workshop , Garching	
	• Contributed talk : “Detailed models of interacting short-period massive binary stars as progenitors of gravitational wave sources.”	November 9, 2021
	Meetings of the German Astronomical Society	
	• Contributed talk : “Nuclear-timescale reverse Algol evolution and hydrogen-rich Wolf-Rayet stars from very massive binaries.”	September 15, 2022
TEACHING EXPERIENCE	• Contributed talk : “X-ray emission from BH + O star binaries expected to descend from the observed galactic WR + O binaries.”	September 15, 2021
	• Contributed talk : “Case A mass transfer: A comprehensive study of their observable stellar properties.”	September 24, 2020
	APS April Meeting “From Quarks to Cosmos”	
	• Contributed talk : “Variability in the winds from magnetized massive stars: effect of unstable magnetosonic modes.”	April 15, 2018
	1. Tutor, Masters courses in University of Bonn	
	• Stellar Nucleosynthesis	Summer semester 2021
	Instructor: Norbert Langer, Argelander Institute for Astronomy	
	• 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	
	2. Online Tutor, Chegg India	August 2018 to July 2022
	3. Instructor, National Service Scheme (NSS), India	August 2013 to July 2015