

Anchal Saxena

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RESEARCH INTERESTS

Cosmic Dawn and Epoch of Reionization (CD-EoR), 21-cm Cosmology, Simulations of CD-EoR and Large Scale Structures, Bayesian Inference, Machine Learning

POSITIONS

- Nov 2025 – Present **Postdoctoral Researcher**, *Max Planck Institute for Radio Astronomy*
Advisors: [Prof. Jonathan Pritchard](#)
 - Intensity Mapping and Machine Learning
- May 2025 – Oct 2025 **Research Assistant**, *Department of Physics, University of Cambridge*
Advisors: [Dr. Eloy de Lera Acedo](#)
 - Performed real-data analysis of REACH dipole-antenna sky measurements, modeling foreground emission, antenna chromaticity and instrumental systematics
- Jan 2021 – Jan 2024 **PhD candidate**, *Van Swinderen Institute, University of Groningen*
Advisors: [Dr. Daan Meerburg](#), [Prof. Léon Koopmans](#) and [Prof. Diederik Roest](#)
Thesis: [Advancing 21-cm Cosmology with Machine Learning](#) 🔗
 - Designed and implemented a simulation-based inference (SBI) pipeline for the REACH global 21-cm experiment, jointly modelling beam-weighted foregrounds, the cosmological 21-cm signal, and instrumental systematics 🔗
 - Developed a pattern-recognition framework, and using simulated multi-antenna observations for upcoming phases of REACH, demonstrated improved recovery of the sky-averaged 21-cm signal 🔗
 - Built an SBI framework to infer astrophysical parameters from the CD-EoR 21-cm power spectrum for SKA1-Low, achieving over an order-of-magnitude speedup vs. classical methods 🔗
 - Recovering cosmological information from EoR observables using machine-learning-based methods (in preparation)

EDUCATION

- July 2018 – June 2020 **M.Sc., Astronomy**, *Indian Institute of Technology, India*
Advisors: [Dr. Suman Majumdar](#) and [Prof. Matteo Viel](#)
Thesis: [Simulating the impact of dark matter models on the EoR 21-cm signal](#) 🔗
- July 2015 – July 2018 **B.Sc. Physics**, *Hansraj College, University of Delhi, India*

PUBLICATIONS

Summary - Total: 8, Citations: 239, h-index: 8, i10-index: 8 ([My ADS library](#))

TALKS AND PRESENTATIONS

- Oct 2025 The Radio Astronomy Laboratory, UC Berkeley (US)
- Dec 2024 [Science At Low Frequencies Conference](#), Shanghai, China

TALKS AND PRESENTATIONS (continued)

Oct 2024	7th Global 21-cm Workshop, Bengaluru, India
Apr 2024	European AI for Fundamental Physics Conference, Amsterdam, Netherlands
Sep 2023	6th Global 21-cm Workshop, IFPU, Trieste (Italy)
May 2023	Neutral Hydrogen as a Cosmological Probe Across Cosmic Time, Nazareth (Israel)
Oct 2022	5th Global 21-cm Workshop, Berkeley (US)
Apr 2022	Observational and Theoretical 21-cm Cosmology, Cambridge (UK)
Oct 2020	3rd Global 21-cm Workshop, Cambridge (UK)
July 2020	Summer All Zoom Epoch of Reionization Conference, Online
Apr 2020	SKA 21-cm Cosmology Group, India (Online)
Jan 2020	Observing the First Billion Years of the Universe, IIT Indore (India)

JOURNAL REVIEWER

Monthly Notices of the Royal Astronomical Society

SCHOOLS AND WORKSHOPS

Apr 2024 - ...	SKA Science Data Challenge 3: Inference
Apr 2024	7th LOFAR Data School, ASTRON, Netherlands
Nov 2023	NOVA Fall School 2023, ASTRON, Netherlands
Jan 2020	Observing the First Billion Years of the Universe, IIT Indore (India)

TEACHING AND MENTORING

Sep 2024 - Nov 2024	Teaching Assistant, Quantum Physics, University of Groningen
Sep 2022 - Nov 2022	Teaching Assistant, Quantum Physics, University of Groningen
Nov 2021 - Apr 2022	Co-supervisor of 1 bachelor student, University of Groningen
Sep 2021 - Nov 2021	Teaching Assistant, Quantum Physics, University of Groningen

COMPUTING SKILLS

Operating System	Linux, Windows, MacOS
Programming Languages	C, Python (including TensorFlow and PyTorch).
Text Processing	L ^A T _E X, MS Office.
Graphics	Matplotlib in Python

AWARDS, FELLOWSHIPS AND GRANTS

Apr 2024	Granted 800 Euro by Leids Kerkhoven-Bosscha Fonds (LKBF) for a conference visit.
Apr 2023	Granted 850 Euro by Leids Kerkhoven-Bosscha Fonds (LKBF) for a conference visit.
Oct 2020	Awarded the Institute Silver Medal for the best academic performance among all students of M.Sc. program graduating in the year 2020
Dec 2019	Qualified the National Eligibility Test (NET-LS), conducted by the CSIR, India for Lectureship (or Assistant Professor) in any Indian University. Ranked 56 th among 38291 candidates.
2015 - 2018	Awarded the INSPIRE fellowship by the Department of Science and Technology.

REFERENCES

- 1 Dr. Daan Meerburg**, *Assistant Professor, University of Groningen*
PhD advisor and scientific collaborator, p.d.meerburg@rug.nl
- 2 Prof. Léon Koopmans**, *Professor, Scientific Director of the Kapteyn Astronomical Institute*
PhD advisor and scientific collaborator, l.v.e.koopmans@rug.nl
- 3 Dr. Suman Majumdar**, *Associate Professor, DAASE, Indian Institute of Technology Indore*
M.Sc. thesis advisor, suman.majumdar@iiti.ac.in