

Sayan Saha

Curriculum Vitae

Personal Information

Nationality Indian
Languages Bengali (native), English (fluent), Hindi (fluent)

Education

Aug 2019 - **PhD**, Department of Physics, Indian Institute of Science Education and Research (IISER), Pune, India,
April 2024 Thesis - **Novel Bayesian Inferences from the Cosmic Microwave Background**, Thesis Supervisor -
[Expected] **Prof. Tarun Souradeep**
2017–2019 **M.Sc. in Physics**, Department of Physics, IISER-Pune, India
2014–2017 **B.Sc. in Physics**, Ramakrishna Mission Residential College, Narendrapur (Calcutta University), India

Visiting Positions

April 2022 - **Visiting Researcher**, Astronomy and Astrophysics, Raman Research Institute, Bengaluru, India,
Present Academic Host - **Prof. Tarun Souradeep**
Sep 2022 - **Swiss Government Excellence Fellow**, Département de Physique Théorique, Université de Genève,
Aug 2023 Switzerland, Academic Host - **Prof. Julien Carron**

Awards & Scholarship

Sep 2022 - Recipient of **Swiss Government Excellence Scholarship (Research)**, ESKAS No. 2022.0316,
Aug 2023 hosted by the University of Geneva. - [Award Letter](#)
March 2023 Recipient of grant (2000 CHF) from **Société académique de Genève (SACAD)** to attend the
Future Science with CMB x LSS workshop at YITP, Kyoto University. - [Award letter](#)
March 2023 Recipient of **Infosys Foundation Travel Award** (50,000 INR) to attend the **Future Cosmology**
workshop at IESC Cargèse, France. Designated as **Infosys Foundation Fellow** - [Award letter](#)
August 2019 Recipient of Institute PhD fellowship from IISER-Pune, MHRD.
2017 - 2019 Recipient of Institute M.Sc. fellowship from IISER-Pune, MHRD.
2017 Certificate of merit as **State Topper** for being placed among the top 1% of 774 candidates in **National Graduate Physics Examination 2017** conducted by **Indian Association of Physics Teachers (IAPT)**.
2014–2017 Recipient of DST-Inspire Scholarship for College & University students by MHRD, Govt. of India.

Publications

2023 **Sayan Saha**, Louis Legrand, and Julien Carron, **Cluster profiles from beyond-the-QE CMB lensing mass maps**, [arXiv:2307.11711 \[astro-ph.CO\]](https://arxiv.org/abs/2307.11711).
2021 **Sayan Saha**, Shabbir Shaikh, Suvodip Mukherjee, Tarun Souradeep, and Benjamin D. Wandelt, **Bayesian estimation of our local motion from the Planck-2018 CMB temperature map**, [arXiv:2106.07666 \[astro-ph.CO\]](https://arxiv.org/abs/2106.07666), JCAP 10 (2021) 072.

Experiments & Collaborations

Cosmoglobe Implementing Hamiltonian Monte-Carlo (HMC) in Commander3 and part of the OpenHFI group
CMB-Bharat Web Coordinator (for the proposed CMB telescope from India)

CMB S4 Provisional member under the supervision of Prof. Julien Carron

Contributed talks & posters

- May-June 2023 Third EuCAPT Annual Symposium, CERN, Geneva, Switzerland. Talk - **Extracting Cluster Information from small-scale CMB**. [[Link](#)]
- April 2023 Future Cosmology, Institut d'Etudes Scientifiques de Cargèse (IESC), France. Talk - **Dark Matter Halos under the spotlight of CMB-Lensing**.
- April 2023 Future Science with CMB x LSS, Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto, Japan. Talk & [Poster](#) - **Dark Matter Halos under the spotlight of CMB-Lensing**.
- January 2023 Cosmoglobe Winter Workshop, University of Oslo, Oslo, Norway. Talk - **Inferring our local motion from Small-scale CMB**.

Computation Skills

Languages	Python, Fortran 90, Shell script
Tools	Git, LaTeX, HTML, HPC computing, MS Office
Codes	Lenslt , plancklens , CAMB, HEALPix (healpy).
Sampling	MCMC Sampling (Metropolis–Hastings, HMC).
ML/DL Libs	scikit-learn, tensorflow.

Relevant ML & DL Courses

- 1 **Neural Networks and Deep Learning**, DeepLearning.AI - [Course Certificate](#)
- 2 **Structuring Machine Learning Projects**, DeepLearning.AI - [Course Certificate](#)
- 3 **Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization**, DeepLearning.AI - [Course Certificate](#)

Teaching & Outreach Experience

- Aug 2019 - Dec 2019 Teaching Assistant for the course **“Electricity & Magnetism, PHY201”** for 2nd year BS-MS students at IISER, Pune under Dr. Aparna Deshpande and Dr. Diptimoy Ghosh.
- Jan 2020 - April 2020 Teaching Assistant for the course **“Nuclear & Particle Physics, PHY422”** for 4th year BS-MS students at IISER, Pune under Prof. Sunil Mukhi.
- Sep 2020 - Jan 2021 Teaching Assistant for the course **“Group Theory in Physics PHY356”** for 4th year BS-MS students at IISER, Pune under Prof. Sudarshan Ananth.
- Sep 2023 Was invited as a judge for the [National Children's Science Congress](#) 2023 (Regional level) in Bengaluru.
- Sep 2023 Gave a talk as a part of the [outreach program](#) for school children organised by Raman Research Institute (RRI), Talk - **The Universe in your pocket** [[slides](#)].

Journal Clubs

Unige	Member of weekly Cosmology Journal Club at Département de Physique Théorique, Université de Genève.
RRI Bengaluru	Member of weekly Journal club, Very Sirius Meeting (VSM) at Astronomy and Astrophysics Department, Raman Research Institute.
IISER Pune	Organizer of Astrophysics, Cosmology, and Particle Physics Journal Club at IISER-Pune (September 2019 - March 2020).

Referees

Supervisor	Prof Tarun Souradeep, Raman Research Institute, Bengaluru, India, Email: tarun@rri.res.in
Collaborator	Prof Julien Carron, University of Geneva, Switzerland, Email: julien.carron@unige.ch
Collaborator	Prof Benjamin D. Wandelt, Institut d'Astrophysique de Paris, France, Email: bwandelt@iap.fr