Education

Degree	INSTITUTE
PhD in Astronomy (Ongoing)	Institute of Astronomy, University of Cambridge, UK
MS (Research), Astronomy, Astrophysics And Space Engineering	Indian Institute of Technology, Indore, MP, India
B.Tech, Electronics and Communication Engineering	MCKV Institute of Engineering, Liluah, WB, India

Research Experience

✔ I am currently involved in a research project focusing on the distribution of X-ray luminosities in X-ray binaries (XRBs). This work involves innovative statistical modeling to understand the stochastic nature of XRB populations. A significant aspect of my research is applying these insights to enhance 21-cm line simulations, which are pivotal in the study of the CD-EoR. This work is being carried out under the supervision of Prof. Anastasia Fialkov.

✔ My Master's thesis focused on analyzing and developing a Machine Learning assisted Bayesian interpretation pipeline for the CD-EoR 21-cm tomographic images (to be produced by the SKA) using a novel statistic – Largest Cluster Statistics (LCS) to understand the topological and morphological evolution of the ionized regions of hydrogen during this era and draw inferences on the ionizing sources and the IGM properties. This work has been done under the supervision of Dr. Suman Majumdar and Prof. Abhirup Datta.

✔ During my Bachelor's I developed a "Digital Michelson Interferometer" which could measure the width of a very thin silver coating on a glass slab. It was a Michelson interferometer digitized using an Arduino DUE with the help of Light Detecting Resistors (LDR). The reported value of the thickness of the coating was 0.25 µm, and our measured value was 0.174 µm. This work was done under the guidance of Dr. Tanmoy Roy Chowdhury and Dr. Dipankar Ghosh.

✔ My B.Tech final year project was to develop a cost-effective device to make a star tracking system using an Arduino DUE and Stellarium. We used Stellarium and linked it with an analog telescope using the Meade LX 200 protocol. Whichever sky object the user pointed to by clicking on the interface of Stellarium, the telescope rotated and pointed itself to that direction by the help of Arduino DUE controlled stepper motors and an accelerometer. This work was done under the guidance of Dr. Krishnendu Chattopadhyay.

Awards

✔ Received Cambridge International & Isaac Newton Studentship from University of Cambridge to pursue a PhD in Astronomy

Teaching Experience

✔ Teaching Assistant in Astronomy Lab (AA651) for Autumn 2022 at Indian Institute of Technology, Indore.

Computing Skills

✔ **Programming Languages:** Python, C, C++, MATLAB

✔ **Simulations:** N-body simulations, FoF Halo finder, 21cmFAST, ReionYuga

✔ **Operating Systems & Word processing softwares:** Windows, Basics of DOS, Linux, MS Word, Latex

Other Projects

✔ Prediction of neutral fraction from HI 21cm maps using Neural Networks

✔ Cosmological parameter estimation using Bayesian inference on supernova 1a data

Publications

Journal:

✔ **Saswata Dasgupta,** Samit Kumar Pal, Satadru Bag, Sohini Dutta, Suman Majumdar, Abhirup Datta, Aadarsh Pathak, Mohd Kamran, Rajesh Mondal, Prakash Sarkar, *Interpreting the HI 21-cm cosmology maps through Largest Cluster Statistics -- I: Impact of the synthetic SKA1-Low observations*, JCAP, DOI: 10.1088/1475-7516/2023/05/014

✔ Aadarsh Pathak, Satadru Bag, **Saswata Dasgupta**, Suman Majumdar, Rajesh Mondal, Mohd Kamran, Prakash Sarkar, *Distinguishing reionization models using the largest cluster statistics of the 21-cm maps,* JCAP, DOI: 10.1088/1475-7516/2022/11/027

Conferences:

✔ **Saswata Dasgupta,** Satadru Bag, Suman Majumdar, Sohini Dutta, *Analysis of realistic HI 21-cm maps from Epoch of Reionization using Largest Cluster Statistics (LCS),* URSI-RCRS, 2022, Index: Sa-JP1-PM1-66

✔ **Saswata Dasgupta**, Iman Ghosh, Nilava Chanda, *Digital Telescope - Star Finder Using Arduino and Stellarium,* Prayas (ISBN-978-93-5300-134-6), Prayas 2018, Page 29

✔ **Saswata Dasgupta**, Shreya Roy, Sreetama Dutta, Sourya Dasgupta, *Digital Interferometer - Measurement of Very Small Dimension of Transparent Silver Coating on a Glass Sample*, Prayas (ISBN-978-93-5300-134-6), Prayas 2018, Page 55

✔ **Saswata Dasgupta**, Sourya Dasgupta, Sreetama Dutta, Jishnu Das, *Seeking inside darkness - Imaging the Black hole Silhouette*, Prayas (ISBN 978-93-5346-951-1), Prayas 2019, Page 103

Talks

✔ Talk on " *Analysing HI 21-cm images from the Epoch of Reionization using Largest Cluster Statistics (LCS)* " at SKA EoR-Cosmic Dawn Science Team Meeting Data Challenges in the SKA Era, Scuola Normale Superiore, Piazza dei Cavalieri 7,Pisa, Italy, 27/09/2022

✔ Talk on " *Analysing HI 21-cm images from the Epoch of Reionization using Largest Cluster Statistics (LCS)* " at Workshop on 21-cm Cosmology in the Square Kilometre Array Era, Indian Statistical Institute Kolkata, 1/11/2022

✔ Talk on " *Analysing HI 21-cm images from the Epoch of Reionization using Largest Cluster Statistics (LCS)* " at 32nd meeting of Indian Association for General Relativity and Gravitation, IISER Kolkata, 1/12/2022

✔ Talk on " *Analysing HI 21-cm images from the Epoch of Reionization using Largest Cluster Statistics (LCS)* " at SKA Cosmology SWG meeting 2023, University of Manchester, 18/01/2023

Industry Experience

✔ Worked as a full time Hardware Integrator at Robert Bosch Engineering and Business Solutions Private Limited with Chinese OEMs (LOVOL, FAWDE and others) for Off Highway vehicle Engine Control Units.

✔ Internship under West Bengal Renewable Energy Development Agency (WBREDA) on Solar Photovoltaic (SPV) Power Plants.

Public Outreach

✔ Some of my scientific articles written in Bangla are published in some local little-magazines.

✔ I used to be an active member of the Astronomy Club at IIT Indore.

Other Interests & Activities

✔ I am trained in Indian Classical Music (Hindustani) and I learnt Carnatic classical music for a year while working at Robert Bosch.