Ashad Ahmad

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Education

2022–2024 **Indian Institute of Technology, Indore**,
Astronomy, Masters of Science.
CPI – 8.79 (Up till Semester 2)

2019–2022 **Karim City College, Jamshedpur**,
Physics (Honours), Bachelor of Science.
Overall Percentage – 85.92%, CGPA – 8.81

2016–2018 **Delhi Public School, Jamshedpur**,
Physics, Chemistry, Mathematics, Computer Science, English, Physical Education, Class 12.
Percentage – 78%

2008–2016 **Modern International School, Al-Hasa, K.S.A**,
Matriculation Examination, Class 10.
CGPA – 10

Experience

Mar 2022–Jul 2022 **Research Intern**, DTU Space, Technical University Of Denmark, Denmark.
- Studying X-Ray Pulsars during it's outbursts and low-luminosity states
- Working under the guidance of Dr. Gaurava Kumar Jaisawal.

Feb 2022–Sept 2022 **Summer Research Intern - Radio Astronomy**, Naxxatra Science.
- Studying the Very Long Baseline Interferometry (VLBI) used by Event Horizon Telescope (EHT)
- Learning Convolution, Deconvolution and Fourier Transform
- Learning to use the CLEAN algorithm on a simulated data

Jun 2021–Aug 2021 **Astrophysics Research Fellowship Program**, SARSTEM.
- Completed a project titled 'Gravitational Wave Data Analysis - Parameter Estimation using Bayesian Analysis' under the supervision of Mr. Edoardo Altamura, Ph.D. Candidate at University of Manchester, U.K.
- Showed excellent pace of learning and performed data analysis
- Worked on the project for 2.5-months and achieved the desired results

Thesis and Projects

May 2023–Ongoing ***Masters thesis*** **- Understanding the formation of peculiar features in AGN Jets at feedback scales**, *Dr. Bhargav Vaidya, Indian Institute of Technology, Indore*.
- Learning the kinematics, dynamics, morphology, and various emission mechanisms of Active Galaxies and AGN (Active Galactic Nuclei) Jets
- Performing 3D Magnetohydrodynamical (MHD) simulations using the freely available `PLUTO` Code

Mar 2022–Jul 2022 **X-Ray Pulsars during outbursts and low-luminosity states**, *Dr. Gaurava K. Jaisawal, Technical University of Denmark*.
- Learned and performing spectral and temporal analysis of various sources
- Created scripts to automate the process of spectral analysis
- Used data available from various X-Ray telescopes

Jun 2021–Aug 2021 **Gravitational Wave Data Analysis - Parameter Estimation using Bayesian Analysis**, *Edoardo Altamura, SARSTEM*.

- Studied The General Theory of Relativity with its applications (Black Holes, Gravitational Waves, and LIGO detectors).
- Analysed data from three LIGO/Virgo observation runs to perform parameter estimation and compare the published results with the estimated data.

Schools and Symposiums

Feb 2022 **X-ray Astronomy School**, .

The topics covered in the school are:

- Introduction to X-Ray Astronomy
- X-Ray Telescopes and Observatories (NUSTAR, XMM-Newton, Neil Gehrels Swift Observatory, Chandra X-Ray Observatory)
- Hands-on Training with actual data using HEASOFT and FTOOLS such as XSPEC, XSELECT etc

Feb 2022 **SOKENDAI Asian Winter School, Astronomy**, NATIONAL ASTRONOMICAL OBSERVATORY OF JAPAN (NAOJ).

The topics covered in the school are:

- Galaxy Evolution, Galaxy Clusters, Planet Formation and The Sun
- Galactic Archaeology and Astro-chemistry
- Gravitational Wave Astronomy, Black Holes and Active Galactic Nuclei

Key Courses

Computational Methods in Astronomy.

- Learned basics of computational physics particularly, solving Partial Differential Equations (PDEs)
- Learned Computational fluid dynamics and wrote various Python codes to solve the Hydrodynamics equation
- Learned *N-Body Simulations* and performed statistical analysis on simulated data

Astrostatistics.

- Learned Applied Probability and Statistics
- Wrote Python codes performing *parameter estimation using Markov Chain Monte Carlo sampling algorithm*

Fluid Dynamics.

- Learned the basics of Hydrodynamics (HD) and Magneto-Hydrodynamics (MHD) equations
- Learned about various instabilities and applications of HD and MHD in astrophysical scenarios

Achievements

Mar 2022 **Joint Admission test for Masters, IIT-JAM**.

- Qualified the National Entrance Test for Master Degree with an overall score of **55.33** out of 100.
- Obtained an All India Rank (AIR) *407*

2015 **National Level Science Talent Search Examination**, NSTSE.

- Scored an overall of 54 out of 100 marks
- Obtained an All India Rank (AIR) *10246*

Nov 2014 **Unified International English Olympiad**, UIE.

- Achieved an All India Rank (AIR) *158*
- Achieved Zone Rank *1*

2014 **National Level Science Talent Search Examination**, NSTSE.

- Scored an overall of 41 out of 100 marks
- Obtained an All India Rank (AIR) *21479*

Nov 2013 **Unified International English Olympiad**, UIE.

- Achieved an All India Rank (AIR) *1228*
- Achieved Zone Rank *13*

Publications

Gravitational Wave Data Analysis and Bayesian Sampling based analysis.

- Authors - *Ashad Ahmad, Sahil Ugale, Aniket Prasad*
- Accepted on 30/10/2021
- Title of Book: Emerging Trends in Science, Social Science, Engineering and Management - A Multidisciplinary Approach (Ref No: RC/IBR/2021- 1078)

Technical Skills

Languages	Python, C, C++, LaTeX, Linux, TCL Scripting, MATLAB
OS	Windows, Linux
Astronomy	PLUTO, HEASOFT, CASA
Utilities	Git/Github, Anaconda, Jupyter Notebook, Google Colab, Mathematica
Communication	English(SRW), Hindi(SRW), Urdu(SRW) *[S–Speaking, R–Reading,W–Writing]*