SHREYAS PADHY

LinkedIn: https://in.linkedin.com/in/shreyaspadhy
E-mail: ph1130871@physics.iitd.ac.in ⋄ shreyaspadhy@gmail.com

EDUCATION

Indian Institute of Technology, Delhi **May 2017 (expected)**
B.Tech in Engineering Physics
Overall GPA: 8.70/10

RELEVANT COURSEWORK

Classical Mechanics & Special Relativity, Computational Physics[1], Statistical Physics[1], Quantum Mechanics, Electrodynamics, Mathematical Physics, Linear Algebra, Calculus, Optics, Semiconductor Devices, Materials Synthesis, Signals and Systems, Digital Electronics, Artificial Intelligence, Data Structures & Algorithms, Numerical Methods in Electromagnetics[2]

RESEARCH INTERESTS

Computational Electromagnetics, Radio & Observational Astronomy, Cosmology & Astrophysics

RESEARCH PROJECTS

Fourier Ptychograpy using Optimization Methods **Jan 2016 - Present**
Under supervision of Dr. Kedar Khare, Dept. of Physics, IIT Delhi

· Working on improving the efficiency and accuracy of ptychographic microscopy using optimization techniques for phase retrieval, such as the Fienup algorithm

Adaptive Meshing Techniques in Microwave Imaging **May 2015 - Present**
Under supervision of Dr. Uday Khankhoje, Dept. of Electrical Engineering, IIT Delhi

· Working on adaptive meshing tehniques to improve resolution and computational time for bio-medical microwave imaging of cancerous tumors.
· Implemented an inverse solver for microwave imaging using the Contrast Source Inversion technique.
· Designed an adaptive mesh reconfiguration algorithm that uses a multilevel sampling algorithm based on filtered backpropagation predictions of the solution to the inverse problem.

Stochastic Methods in Rough Surface Scattering **December 2014 - Present**
Under supervision of Dr. Uday Khankhoje, Dept. of Electrical Engineering, IIT Delhi

· Working on stochastic modelling of rough surfaces to improve speed of forward solver in radar backscattering from inhomogenous rough soil.
· Implemented a stochastic modelling of the rough surface using a Kosambi-Karhunen-Loeve expansion in the Galerkin polynomial chaos basis involved in the Finite Element Method solution.

Study of the Crab Nebula using Ground Based Gamma Ray Telescopy **December 2013**
Under supervision of Dr. Kuldeep Yadav, Bhabha Atomic Research Centre

· Analysed the periodicity and spectrum of the gamma ray emission of the Crab Nebula using very high energy ground-based gamma ray telescopy methods.
· Analysed data obtained from observations made by the TACTIC telescope located at Mt. Abu, Rajasthan.

[1] Current
[2] Non-graded

RESEARCH EXPOSURE

Pulsar Observatory for Students **July 2013**
Conducted by National Centre for Radio Astrophysics

- Performed time-series observations for prominent pulsars B1642-03, B1133-16, and Vela pulsar using the Ooty Radio Telescope.
- Calculated the dispersion measure, flux density, period, modulation index and pulse broadening of B1642-03 and Vela pulsar.

National Initiative for Undergraduate Studies Physics Camp **May 2014 - June 2014**
Conducted by Homi Bhabha Centre for Science Education

- Part of 40 students selected from across India to receive research exposure on a variety of topics from prominent researchers in the field.
- Attended lectures on Stellar Astrophysics, Neutron Star Condensed Matter Physics, Newtonian Cosmology, Radio Interferometry, Quantum Computation, Solitons and Non-Linear Fibre Optics, and Particle Physics.

Winter Internship at National Centre for Radio Astrophysics **December 2014**
Under Dr. Tirthankar Roy Choudhary, NCRA

- Worked on mass functions defining large scale structure in cosmological models defining the early Universe, and the application of random walks in calculating and approximating these mass functions.

International Olympiad in Astronomy and Astrophysics National Training Camp **March 2013 - May 2013**
Conducted by Homi Bhabha Centre for Science Education

- Part of 30 students selected from across India to receive training for the International Olympiad in Astronomy and Astrophysics, in observational astronomy and theoretical astrophysics.

TECHNICAL PROJECTS

Amateur Radio Interferometer Experimental System **July 2015 - Present**
Under the ARIES program, IIT Delhi

- Made an amateur radio telescope from a satellite dish capable of recording the 21cm line from measurements of the Sun.
- Currently working on building a two-dish interferometer with a tracking mount to capture 21cm galactic line.

Multiple Sequence Alignment of DNA **February 2015 - May 2015**
Course Project, Under supervision of Dr. Mausam, Dept. of Computer Science, IIT Delhi

- Implemented depth-first-search with branch & bound for optimal solution to alignment of multiple DNA sequences.
- Implemented greedy hill-climbing local search with simulated annealing, and pseudo-random restarts, for non-optimal solution.

TECHNICAL STRENGTHS

Computer Languages	C++, Java, Python, LaTeX, Verilog
Computational EM	Meep (FDTD), Cubit (Meshing), Seldon
Mathematical Computing	MATLAB, Mathematica, R
App Design	iOS (Objective C)

SCHOLASTIC ACHIEVEMENTS

- Received Merit Scholarship for Top 7% GPA in institute in Fall Semesters, 2013 and 2014.
- Recipient of the KVPY Scholarship in the year 2011-2012
- Recipient of the NTSE Scholarship in the year 2010-2011