

Devang Haresh Liya

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INTERESTS	Galaxy formation and evolution in light of primordial structures in the universe. Particularly, using multi-wavelength tools and novel statistical techniques to study the galaxy-halo connections.	
EDUCATION	Indian Institute of Science Education and Research, Mohali, India <ul style="list-style-type: none">▪ Candidate for Integrated BS-MS in Physics with a minor in Astronomy Aug 2017 – Jul 2022<ul style="list-style-type: none">• CPI: 8.3 VESIT, Mumbai University, Mumbai, India <ul style="list-style-type: none">▪ Dropped out of the Department of Computer Engineering to pursue physics. Jun 2016 – May 2017 Hill Spring International Junior College, Kalyan, India <ul style="list-style-type: none">▪ High School Jun 2014 – May 2016<ul style="list-style-type: none">• Cleared HSC Class 12 Examinations with 89.8%	
COMPUTATIONAL SKILLS	Python, C/C++, MATLAB, SageMath, Julia, DS9, HEASoft suite, CASA, MySQL, Proteus, LTSpice, Photoshop/Illustrator, Office softwares, Linux OS, MPI, git, \LaTeX , HTML/CSS, GNU Bash	
RELEVANT COURSEWORK	<ul style="list-style-type: none">▪ Physics: Classical mechanics, Electrodynamics, Advanced quantum mechanics, Thermodynamics & statistical mechanics, Solid state physics, Nuclear and particle physics.▪ Mathematics: Group theory & linear algebra, Probability & statistics, Curves & surfaces, Mathematical methods for physicists, Computational methods for physicists.▪ Astronomy: Astronomy & Astrophysics, Astrophysical processes and stars, High energy astrophysics, Physics of fluids.▪ Others: Network science, Modelling complex systems, Climate change & sustainable development, Philosophy of science, Principles of economics	
RESEARCH EXPERIENCE	IISER, Mohali, India; IUCAA, Pune, India; NISER, Bhubaneswar, India <ul style="list-style-type: none">▪ Master's thesis Aug 2021 – Present<ul style="list-style-type: none">• Supervisors: Prof. Jasjeet Singh Bagla, Dr. Aseem Paranjape, and Dr. Nishikanta Khandai• Project: Study of the influence of large scale tidal field in a variety of ways to quantify the effect of the shape of the power spectrum on the mass function of the collapsed halos in power law models.• Key concepts: Excursion set theory, Halo model, Cosmological simulations. Astronomical Institute of the Czech Academy of Sciences, Praha, Czechia; IISER, Mohali, India <ul style="list-style-type: none">▪ Extended summer research project May 2021 – Present<ul style="list-style-type: none">• Supervisors: Dr. Peter Boorman and Dr. Aru Beri• Project: A multi-mission broadband study of x-ray spectrum of a heavily obscured Active Galactic Nucleus – NGC 2788A – using robust global sampling algorithms. Also wrote a proposal to observe this source using XMM-Newton.• Key concepts: X-ray spectral analysis, Bayesian techniques, Global sampling algorithms, scientific proposal writing. Royal Observatory of Edinburgh, Edinburgh, UK; IUCAA, Pune, India <ul style="list-style-type: none">▪ Extended summer research project May 2020 – Present<ul style="list-style-type: none">• Supervisors: Dr. Shadab Alam and Dr. Aseem Pranajpae• Project: Study of the effectiveness of Voronoi Volume Function (VVF) as a clustering measurement in constraining various cosmological and HOD parameters.• Key concepts: Fisher forecast, Galaxy redshift survey, Interplay between HOD and cosmology. Ludwig Maximilian University of Munich, Munich, Germany <ul style="list-style-type: none">▪ Research Collaboration Jan 2020 – Jul 2020<ul style="list-style-type: none">• Collaborator: Dr Arpit Kumar Pradhan• Project: Robust genome analysis of SARS-CoV-2 and identifying potential targets for drug repurposing using molecular dynamics simulations.• Key concepts: Mutation analysis, docking and modelling studies.	

IISER, Mohali, India; Raman Research Institute, Bangalore, India

- Long term project May 2019 – Jan 2020
 - Supervisors: Prof. Jasjeet Singh Bagla and Prof. Avinash Deshpande
 - Project: Development of software tools to produce an image in radio band using raw data from the MWA type 7-tile telescope. Study of electronics, beamformers, data acquisition system, and remote observations.
 - Key concepts: Radio data analysis, aperture synthesis.

IISER, Mohali, India

- Summer project May 2018 – Jul 2018
 - Supervisor: Prof. Kulinder Pal Singh
 - Project: Understand imaging/non-imaging x-ray telescopes and various emission mechanisms that produce x-rays. Extract light curves, images, and spectra for galaxy cluster A85 using ESAS software.
 - Key concepts: Basics of x-ray astronomy, x-ray data analysis.

IISER, Mohali, India

- Student project Oct 2017 – Nov 2018
 - Supervisor: Prof. Anand Kumar Bachhawat
 - Project: Development of a bio-synthetic deterrent by using genetically engineered yeast to produce cat pheromones along with hardware and software tools to deploy the product. Development of various visualizations and a website to document the work and present it in an accessible manner as a part of iGEM 2018.
 - Key concepts: Synthetic biology, diffusion modelling, 3D printing, web development.

PUBLICATIONS

PUBLISHED

- [1] Mouroug Anand, Nithishwer, Haresh Liya, Devang, Pradhan, Arpit Kumar, Tayal, Nitish; Bansal, Abhinav; Donakonda, Sainitin; et al. (2020): A Comprehensive SARS-CoV-2 Genomic Analysis Identifies Potential Targets for Drug Repurposing. *Plos One* (<https://doi.org/10.1371/journal.pone.0248553>)
- [2] Devang Haresh Liya, Mirudula Elanchezhian, Mukulika Pahari, Nithishwer Mouroug Anand, Shivani Suresh, Nivedha Balaji, Ashwin Kumar Jainarayanan et al. (2021): QPromoters: Sequence based prediction of promoter strength in *Saccharomyces cerevisiae* *bioRxiv* (doi: <https://doi.org/10.1101/2021.04.27.441621>)
- [3] Beal, J., Farny, N.G., Haddock-Angelli, T., Selvarajah, V., Baldwin, G. S., Buckley-Taylor, R., Gershater M., Kiga, D., Marken, J., Sanchania, V., Sison A., Workman C. T. & iGEM Interlab Study Contributors et al. (2020) Robust estimation of bacterial cell count from optical density. *Commun Biol* 3, 512. *Communications Biology* (<https://doi.org/10.1038/s42003-020-01127-5>)

AWARDS & SCHOLARSHIPS

- Innovation in Science Pursuit for Inspired Research (INSPIRE) Fellowship Aug 2017- Present
For scoring top 1 percentile marks in Class 12 examinations.
- Won Bronze medal and got nominated for the best food and nutrition project at iGEM, 2018 Oct 2018
Presented the work on FearOmone: A cat pheromone-based deterrent to minimize rat infestation.
- Won the Sky Watch Array Network (SWAN) Imaging challenge Sep 2019
Produced an image of the Sun at 195 MHz using the raw data from the MWA-type SWAN setup.
- Won the astronomy hackathon and quiz at the North India Astronomy Meet, IIT-Mandi 2019, 2020
- Best project award at the Awakening a Scientist competition, VESIT, Mumbai Oct 2016
- Various awards for documentaries and short films made at VESIT, Mumbai Mar 2016
Winner of the best documentary award, runner-up for the best short film award.

CONFERENCES & WORKSHOPS

- Chandra Data Science Workshop, Virtual, Organized by Chandra X-ray Center, Smithsonian Astrophysical Observatory, Cambridge, USA Aug 2021
- MPI with C++, Virtual, Organized by Department of Physical sciences, IISER-Mohali, India Apr 2021
- Workshop on Temporal Single Cell Analysis, Virtual, Organized by SCOG Sep 2020
- Physics of the Early Universe - An Online Precursor, Virtual, Organized by International Center for Theoretical Sciences (ICTS), Bangalore, India Aug 2020
- AstraX - North India Astronomy Meet, organized by IIT-Mandi, India Mar 2020, Mar 2019
- SWAN Hands-on workshop, Gauribidanur Radio Observatory, Bangalore, India Jun 2019

Learnt about MWA-type antennas, Beamformers, and Data Acquisition System. Used the SWAN setup to observe Cassiopeia A and Cygnus A, performed preliminary analysis on the raw data.

- Modeling Synthetic Biology Systems with MATLAB and SimBiology, iGEM, Boston, USA Oct 2018
- International Genetically Engineered Machines (iGEM), Boston, USA Oct 2018
Presented the work on Food safety and Security.

NON SCHOLASTIC & OUTREACH

- Organizing various outreach activities related to astronomy as a convener of The Astronomy Club at IISER-Mohali (Sep 2018 – Nov 2021)
- Involved in training younger members of the SWAN group at IISER-Mohali in radio astronomy.
- Quizmaster at Vigyan Samagam – first mega science exhibition in India – Delhi edition
- Hosted a Reddit AMA to spread awareness about synthetic biology and general scientific thinking.
- Speaker at the *Ignite Talks, Mumbai University*.
- Interested in developing computational and visual tools to aid holistic teaching in science.
- Expert in web-designing and video editing.

[CV compiled on 2021-11-29]