

# Swaraj V.

*Cosmology – Dark Matter Halos  
Large-Scale Scientific Data Analysis–  
N -body Simulations*

ADDRESS: 94, Devathiyal,  
Thehippalam, Malappuram,  
Kerala, 673636  
WEBSITE: [swarajvee.github.io](https://swarajvee.github.io)  
EMAIL: meswarajv@gmail.com

---

EDUCATION	<b>Integrated Master of Science in Physics</b> Cochin University of Science and Technology, Cochin, India	July 2019–Aug. 2025
	<b>Data-driven Astronomy</b> University of Sydney, Sydney, Australia (Online)	Dec. 2023–Feb 2024
PROJECTS	<b>Density Profiles of Dark Matter Halos</b>	Dec. 2023–May 2024
	<ul style="list-style-type: none"><li>Analysed dark matter halos using AbacusSummit N-Body Simulations based on Planck2018 <math>\Lambda</math>CDM model</li><li>Processed large-scale halo catalogs (<math>\sim 4.5\text{M}</math> data points) to compute mass functions and radial density profiles</li><li>Validated results against analytical and NFW models, revealing strong consistency across redshifts and insights into structure formation</li></ul>	
	<b>Open-Source Program for Lab Automation</b>	Jan. 2022–July 2023
	<ul style="list-style-type: none"><li>Developed an open-source python program for automating lab equipment, removing reliance on proprietary softwares</li><li>Implemented full control of the Keithley 2400 SMU for I–V characterization of diodes and LEDs with integrated data visualization</li><li>Enabled reproducible, low-intervention experiments and extensible workflows through open-source customization</li></ul>	
SKILLS	Languages: Malayalam, English, Hindi and Tamil Programming: Python, C++ and SQL Research Tools: Globus, OriginLab, LaTeX, Microsoft Office Development: Git and Nvim	
CONF. & WORKSHOPS	1. NCFMA-2024 <i>Rashtriya Uchchatar Shiksha Abhiyan</i> 2. IUAC Accelerator Science Workshop <i>Inter University Accelerator Centre</i> 3. Workshop on Cyber Security <i>University Union Knowledge Fest</i> 4. SpaceUp CUSAT 2020 <i>The Space Unconference with ISRO Scientists</i>	18 <sup>th</sup> –19 <sup>th</sup> Jan. 2024 8 <sup>th</sup> Aug. 2023 3 <sup>rd</sup> –6 <sup>th</sup> Feb. 2020 16 <sup>th</sup> Feb. 2020
VOLUNTEER WORKS	Active Volunteer, National Service Scheme Participated in community service, awareness campaigns, and volunteering initiatives	2020–2022

AWARDS	1. Cochin University Inter-Zone Arts Festival <i>Runner Up Non-percussion string instruments</i>	2020, 2022
	2. Malappuram Revenue District Youth Festival <i>Four Times Runner Up, Guitar Western</i>	2016–2019
REFERENCES	<p>1. <b>Dr. Charles Jose</b>            Assistant Professor, Department of Physics            Cochin University of Science and Technology  <i>Relationship: Project Advisor, Density profiles of dark matter halos</i></p> <p>2. <b>Dr. Vineeth Mohanan Parakkat</b>            Assistant Professor, Department of Physics            Cochin University of Science and Technology  <i>Relationship: Project Advisor, Development of open-source python program for lab automation</i></p>	