

Swaraj V.

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

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Kerala, 673636
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EDUCATION	Integrated Master of Science in Physics Cochin University of Science and Technology, Cochin, India Data-driven Astronomy University of Sydney, Sydney, Australia (Online)	July 2019–Aug. 2025 Dec. 2023–Feb 2024
PROJECTS	Density Profiles of Dark Matter Halos <ul style="list-style-type: none">Analysed dark matter halos using AbacusSummit N-Body Simulations based on Planck2018 ΛCDM modelProcessed large-scale halo catalogs (~ 4.5M data points) to compute mass functions and radial density profilesValidated results against analytical and NFW models, revealing strong consistency across redshifts and insights into structure formation Open-Source Program for Lab Automation <ul style="list-style-type: none">Developed an open-source python program for automating lab equipment, removing reliance on proprietary softwaresImplemented full control of the Keithley 2400 SMU for I–V characterization of diodes and LEDs with integrated data visualizationEnabled reproducible, low-intervention experiments and extensible workflows through open-source customization	Dec. 2023–May 2024 Jan. 2022–July 2023
SKILLS	Languages: Malayalam, English, Hindi and Tamil Programming: Python, C++ and SQL Research Tools: Globus, OriginLab, LaTeX, Microsoft Office Software & 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 th –19 th Jan. 2024 8 th Aug. 2023 3 rd –6 th Feb. 2020 16 th Feb. 2020
VOLUNTEER WORKS	<i>Active Volunteer, National Service Scheme</i> Participated in community service, awareness campaigns, and volunteering initiatives	2020–2022

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