

John Erinjery

3rd Year BS-MS Dual Degree, Physics, IISER Pune

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📄 ORCID

Education

BS-MS Dual Degree, Physics

Expected 2029

Indian Institute of Science Education and Research (IISER), Pune

Focus: Astrophysics, Cosmology

Research Interests

Large-scale structure, galaxy evolution and quenching, cosmic filaments, cosmology, planetary science

Research Projects

Filament-Proximate Galaxy Mergers and Quenching

Ongoing

- Comparing quenching proxies (e.g. D4000 index) of merging pairs as a function of filament distance, controlling for stellar mass and cluster proximity.
- Tests whether the filament environment specifically drives quenching in merger pairs – a gap identified in Dulcien et al. (2026).

Disentangling Filament vs. Cluster Influence on Mergers

Proposed

- Binning mergers in (d_filament, d_cluster) space and using partial correlations to separate independent effects.
- Tests whether filament proximity has any residual effect on merger rate after controlling for cluster distance.

Galaxy Morphology as a Function of Filament Distance

Proposed

- Using Galaxy Zoo morphological classifications to test whether the fraction of early-type galaxies increases closer to filaments, after accounting for stellar mass and local density.
- Motivated by tidal torque theory's prediction that galaxy spin should align with nearby filaments; morphology serves as a rough proxy for this effect.

Technical Skills

Programming: Python (astroquery, scipy, seaborn, PyTorch), Julia (basic), Fortran

Tools: L^AT_EX, Git/GitHub, DisPerSE

Data Analysis: Familiar with major astronomical surveys (SDSS, DESI, GAMA, COSMOS) and their data products; experience with statistical analysis and visualization of large datasets.

Schools and Workshops

- Undergraduate Summer School on Nuclear Physics, IIT Roorkee, 2025 – *Participant, presented a talk on the Yukawa potential.*
- IISc Physics Winter School, 2025 – Evaluated Participant (coursework and quizzes).
- Winter Training Programme, India Space Academy, 2026 – Completed six-week programme in astronomy and astrophysics; submitted project report, “*Evaluating the Habitability of Exoplanets by Studying their Characteristic Properties.*”

Positions of Responsibility

- Onam Committee, IISER Pune