Rishabh Solanki
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Research Interests

Compact binary stellar object mergers, Type Ia supernovae, Machine learning, Deep neural networks, Accretion disks, Magnetohydrodynamics, turbulence, general relativity, cosmology

Work Experience

Graduate Teaching Assistant

Department of Physics, University of Massachusetts Dartmouth

September 1, 2021 – May 5, 2022

Responsible for teaching recitation and laboratory classes in the undergraduate series, Physics for Science and Engineering.

Research Assistant

Fisher Computational Astrophysics Group (novastella.org)

September 1, 2021 – Present

Developing MHD solvers for magnetohydrodynamical simulations of white dwarf mergers

Education

Master of Science, Physics
University of Massachusetts Dartmouth
2021-23, current GPA 4.0

Bachelor of Technology, Aerospace Engineering
University of Petroleum and Energy Studies (UPES)
2014-18, GPA 3.0

Skills

Computer Languages: Python, Java, FORTRAN, SQL, C, JavaScript, HTML

Software and Tools: Word, Excel, LaTeX, MATLAB, FLASH

Languages: English, Hindi

Research Experience

Master's Thesis: Evolution of white dwarf mergers with magnetohydrodynamic scheme and alpha disk prescription, ongoing (Adviser: Robert Fisher, PhD)

- Developing MHD solver to understand the post-merger evolution of Carbon Oxygen white dwarfs. Implementation is drawn and motivated from Bouchut solver as given in Waagan et al. (2011)

Undergraduate thesis: ***Simulation of celestial bodies interacting under gravitational field,*** 2017-18 (Adviser: Ugur Guven, PhD)

- Used RK4 scheme to interpolate the orbital trajectories of objects under influence of a gravitational source.

- Extended the solver to include effects like orbital decay, albedo and third body perturbations.

Reduction in Background Noise in the data of distant celestial bodies (Intern, Instruments Research & Development Establishment) (May – September 2017)

- worked on estimation of centroid shift in the light curve data to account for the shimmering of the atmosphere.

Research Reviews

- *Role of magnetic fields in population III star formation*
- *Simulation of early structure formation: Primordial gas clouds*
- *Gravitational forces inducing heat in the core of moons of Jupiter* (IGNITE 2018, UPES).

Awards

- Award of Excellence, Infinity Space Club, 2018
- The prestigious Space Quiz, Ignite, 2016
- Special Mention, 7th International Innovation Day, 2012
- Ranked Ace in National Merit Scholarship Test, 2010

Community service

Indian student Association, UMass Dartmouth

Co-organizer: Infinity Space Club (2017-18)

Volunteer: Annual Blood Donation Camp, UPES (2015-18)