Abhinav Govindan Iyer

Curriculum Vitae

School of Physics, IISER Thiruvananthapuram
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Education

2021–2023 **Master of Science - Physics**, *Indian Institute of Science Education and Research*, Thiruvananthapuram, *GPA - 8.55*

2018–2021 **Bachelor of Science - Physics (Honours)**, *Azim Premji University*, Bangalore, *GPA − 8.78*

Publications

1. Iyer, Abhinav G., et al. "An approximate superposition method to obtain a planet's orbit." *European Journal of Physics 43.1* (2021): 015001

Research Experience

2023– **Research Project**
Advisor : Dr. Bidya Binay Karak, IIT (BHU) Varanasi
- Currently studying stochastically forced, non-linear time delay solar dynamo models.
- Solved the dynamo equations using Python and plotted timeseries data of the square of toroidal field. Trying to understand the distribution of grand minima.
- Plotted bifurcation diagrams of toroidal magnetic field as a function of dynamo number to study period doubling and chaotic regions in Babcock-Leighton dynamo mechanisms.

2022-2023 **Master's Thesis**, *IISER Thiruvananthapuram*
Advisor : Dr. Nitin Yadav
- Studied the magnetic reconnection-condensation model for solar prominence formation.
- Performed simulations on MPI-AMRVAC and solved 1D radiative hydrodynamic equations along a given magnetic loop.
- Visualized the prominence formation by plotting timeseries data of temperature and hydrogen number density along the length of the loop.
- Studied the dependence of prominence formation on various parameters. Also analysed the scenarios with asymmetric heating on either footpoints of the loop.

2019–2021 **Bachelor's Thesis**, *Azim Premji University*, Bangalore
Advisor : Dr. Jayanth Vyasanakere
- Performed solar system simulations on Python by solving gravitational equations through Runge-Kutta 4th Order Method.
- Compared simulated data with real world observations to high degree of accuracy (to within 10^{-6} percentage).
- Verified an approximate superposition method for deviations in planetary orbits.
- Developed an algorithm to obtain planetary orbits in lesser time while maintainting good level of accuracy.

Courses and Conferences

June - 2023 **Workshop**, International Centre for Theoretical Sciences, Bangalore
Mathematical modeling of Climate, Ocean, and Atmosphere processes

March - 2023 **Workshop**, Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune
Sun and Space Weather-Impacts on Terrestrial Environment

May - 2019 **Summer Course**, International Centre for Theoretical Sciences, Bangalore
Neutron Stars and Black Holes by Professor Ganesan Srinivasan

Contributed Talks

2023 Master's thesis presentation at IISER Thiruvananthapuram

2022 Seminar delivered on the topic of "*Neutrino Detection using the IceCube Observatory*" at IISER Thiruvananthapuram

2021 Seminar delivered on the topic of "*Brown Dwarfs*" at IISER Thiruvananthapuram

2021 Bachelor's thesis presentation at Azim Premji University, Bangalore

Computer skills

Advanced PYTHON, LATEX, Linux

Intermediate MPI-AMRVAC, Mathematica, Microsoft Excel

Basic C++, MATLAB