Curriculum Vitae

Ashish Kumar Nayak

Personal Information

Date of Birth: 13 th May, 2002

Address: At/Po.- Nuapara, Block-AUL Dist-Kendrapara , Odisha , India , Pin code-754218

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Academic Qualification

Indian Institute of Technology Kanpur (IITK), Kanpur 2024
Master of Science in Physics
CPI: 7.6/10.00

Kendrapara Autonomous College, Kendrapara 2022
Bachelor of Science with Physics Major
CGPA: 9.47/10.00

Affiliated to - Utakal University, Odisha
Kendrapara Higher Secondary School, Kendrpara) 2019
12th Standard, Council of Higher Secondary Education, Odisha.
Percentage: 85.16

Gopabandhu Vidyalaya, Kolkata 2017
10th Standard, West bengal Board of Secondary Education.
Percentage: 83.14

Skills & Languages

- **Programming Languages and Softwares** : Python, Fortran 90, Gnuplot, C, LaTeX, Origin
- **Languages** : Odia (Native), Hindi, English

Project Work

- **Master's Thesis Project**: "Numerical Study of Rotational and Tidal Deformation in Stars and Planets".
- **Project Advisor**: Prof. Gopal Hazra, IIT Kanpur.
- **Duration**: Completed.(manuscript in preparation).
- **Abstract**: Astrophysical fluid bodies that orbit around close to another astrophysical body induced tidal potential, and this leads to some deformation. The aim of the project is to understand how tidal potential can deform planets structure, with the help of python code RUBIS. In the case of Hot Jupiters, these deformations become very significant and noticeable. Recent results from transit light curve data analysis shows that there are few planets observed with a noticeable deformation in their shapes . We will start our analysis

by assuming certain conditions such as the relationship between density and pressure is preserved during the deformation process and the equation of state obey barotropic condition. Here, we analyze five exoplanets and calculate the tidal deformation occurring in these planets. Additionally, we calculate the gravitational moments of these deformed structures.

Presentation

- "Numerical Studies of Rotational and Tidal Deformation in gas giants", presented in Master's thesis presentation, IIT Kanpur

Acheivements

- INSPIRE scholar, Department of Science and Technology, Government of India. (Awarded to top 1 % of students at their higher secondary(+2) level, who are pursuing bachelors degrees in basic sciences), 2019.
- Secured All India Rank **193** in Joint Admission Test of Masters (JAM) in 2022.
- Qualified GATE 2024 with gate score 481 , AIR 1050 ,mark secured: 40.66.
- Qualified JEST 2024 with AIR 477 .

References

1. Prof. Gopal Hazra, Assistant Professor, Department of Physics, Indian Institute of Technology, Kanpur.

Email: hazra@iitk.ac.in

Coursework Completed

Undergraduate courses:

For details about the following courses, please refer to the CBCS syllabus in the UG syllabus section of Utkal University.

- **Mathematical Physics I**
- **Classical Mechanics I & Special Relativity**
- **Electricity and Magnetism**
- **Waves and Optics**
- **Thermal Physics**
- **Mathematical Methods II**
- **Analog Systems And Application**
- **Mathematical Physics III**
- **Modern Physics**
- **Quantum Mechanics**
- **Digital Systems And Application**
- **Statistical Physics**
- **Classical dynamics** [Elective]
- **Nano Materials and Applications** [Elective]
- **Electromagnetic Theory (Em wave)**

- **Solid State Physics**
- **Nuclear and Particle Physics** [Elective]
- **Statistical Methods and Error Analysis** Also I did UG experimental labs which includes in each coursework as per Utkal University UG syllabus.

Postgraduate courses:

For details about the following courses, please refer to the Course Details section in the Department of Physics page of IIT Kanpur website. These courses I have done till third semester at IITK.

- **PHY401: Classical Mechanics**
- **PHY421: Mathematical Methods I**
- **PHY431: Quantum Mechanics I**
- **PHY441: Electronics**
- **PHY461: Experimental Physics I**
- **PHY412: Statistical Mechanics**
- **PHY552: Classical Electrodynamics I**
- **PHY432: Quantum Mechanics II**
- **PHY473: Computational Physics**
- **PHY462: Experimental Physics II** (General Physics Lab)
- **PHY407: Special and General Theory of Relativity**
- **PHY553: Condensed Matter Physics**
- **PHY681: Quantum Field Theory I**
- **PHY611: Introduction To Nuclear and Particle Physics**
- **PHY625: Mathematical Methods II**
- **PHY 612: Atomic, Molecular And Optical Physics**
- For my masters project work I have read Physics of **The Physics of Fluids and Plasmas An Introduction for Astrophysicists.**

Workshop Attended

- Attended **Aditya-L1 Support Cell Workshop** Organised at IIT Kanpur.