# JYOTIRAJ NATH

+91 6001532852 ◇ Surat, India

jnath1729@gmail.com Jyotiraj-Nath Jyotiraj-SVNIT

## EDUCATION

**Integrated MSc in Physics**, NIT Surat, India [CGPA: 8.68/10] (2020-2025)
*Relevant Coursework: Classical Mechanics, Solid State Physics, Electromagnetics, Quantum Mechanics, Computational Techniques, Plasma Physics, Atomic and Molecular Physics and Astronomy and Astrophysics*

**Higher Secondary**, SVJC Guwahati [Percentage: 85.5% (92% -Physics, Chemistry, Mathematics)] 2018 - 2020

## SKILLS

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|---|---|
| **Technical languages** | Python, JAVA, JavaScript, C++, Linux CLI, MATLAB, Wolfram Mathematica |
| **Technical Tools** | GIT, VS Code, Stellarium, LaTeX, OpenGL, Adobe illustrator, Adobe Photoshop |
| **Languages** | English, Bengali, Hindi, Assamese |

## RESEARCH EXPERIENCE

**Curved Prism based Imaging- spectrometer design in a CubeSat format for Astronomical Studies** May 2023- ongoing
Physical Research Laboratory, India

- Visualized the spectrographic data with the designed curved prism
- Addressed Astronomical science cases with the imaging spectrometer in a 4U CubeSat

**Bidirectional Quantum Teleporation over a Amplitude Damping noisy channel for two qubit state** January 2023- May, 2023
SVNIT, Surat

- Built a quantum circuit for Bi-Directional teleportation using Qiskit
- Studied the error generated due to a noisy channel

**Quantum Mechanical Study on Tritium-3** September 2022 - December 2022
SVNIT, Surat

- Formulated the radial and angular equation for Hydrogen-3 isotope (Tritium)
- Calculated the electromagnetic effects on Tritium and hyperfine structure of Tritium is calculated

## ACADEMIC PROJECT

- **The formation of different astronomical structures from the stellar material of death stars**
  Scrapping the death data of different stars and assorting them according to their luminosity and mass. The probability and formation of different astronomical structures from the stellar death stardust is then computationally observed and plotted
- **Analyzed the spectrum of HD 94028 star and determined the receding speed using MATLAB**
  Used the matrix data of wavelengths of star HD 94028 to get the value of alpha Hydrogen wavelength using plotting methods in MATLAB. Used formula to calculate the redshift factor and the receding speed (Certificate)

## RELEVANT COURSES

- **Scientific computing with Python** (Certificate) Used Python dictionaries, Regular expressions, and networking for web scrapping. Designed Relational database and visualized data using python libraries
- **Data Visualization with Matplotlib** (Certificate) Used concepts of Matplotlib into data visualization
- **Discrete Mathematics** (Certificate) Introduced to the abstract usage of numbers for system operations

- **AstroTech: The Science and Technology behind Astronomical Discovery** (Certificate) Explored about different observation and data manipulation methods used in sky viewing
- **Calculus using Wolfram Mathematica** (Ongoing) Using hands-on concepts of Calculus with the Wolfram language

## EXTRA-CURRICULAR ACTIVITIES

- **Senior member at SCOSH**, the science club of NIT Surat
- **Senior Graphic Designer at RENESA**, contributed to various authorized magazines published by the publishing committee of NIT Surat
- **Visharad in Indian Classical instrument Tabla** Completed 5-year degree with a distinction and played on classical festivals