

# ZENIA ZURAIQ

*Theoretical Physicist in the Making*

Email : zeniazuraiq@gmail.com, zeniazuraiq@iisc.ac.in

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## Education

Aug 2022 - Present Bengaluru, India	<b>Doctor of Philosophy (Ph.D.) - Theoretical Physics</b> Indian Institute of Science
Sep 2020 - Jun 2022 Tiruchirappalli, India	<b>Master of Science (M.Sc.) - Physics; CGPA: 9.79/10</b> National Institute of Technology, Tiruchirappalli (NIT-T)
Jun 2017 - Aug 2022 Chennai, India	<b>Bachelor of Science (B.Sc.) - Physics; CGPA: 9.31/10</b> Stella Maris College, University of Madras
May 2017 Chennai, India	<b>Class XII Board Exam (AISSCE, CBSE); Percentage: 97.4%</b> St. John's English School and Junior College, Besant Nagar
May 2015 Chennai, India	<b>Class X Board Exam (AISSE, CBSE); CGPA: 10/10</b> St. John's English School and Junior College, Besant Nagar

## Research Experience

- **August 2022:** *National Institute of Technology, Tiruchirappalli (NIT-T)*

**Project Report:** "Observation of 21cm line using custom made radio telescope from milky way galactic plane"

**Guide:** Dr. R. Justin Joseyphus, Associate Professor, NIT-T.

Got a horn antenna radio telescope built at NIT-T as part of the PRL VISION 2019 competition operational again. Analysed s-parameters, impedance, and other antenna properties. Used the antenna to measure the 21cm HI line from the milky way galactic plane and other constellations.

- **May 2022:** *National Institute of Technology, Tiruchirappalli (NIT-T)*

**M.Sc. Thesis:** "Effects of fermion mass and strong two-body interactions on the mass-radius relationship of non-rotating compact stars"

**Guide:** Dr. Somnath Mukhopadhyay, Assistant Professor, NIT-T.

Numerically solved the Tolman-Oppenheimer-Volkoff (TOV) equation for different equation of state (EoS) inputs, i.e, interacting and non-interacting fermion gas of different fermion masses and interaction strengths. Analysed how the mass-radius relationship and compact star mass limit varies with different EoS inputs

- **September 2019:** *Centre for Research in Science and Technology (CRIST), Stella Maris College (Chennai)*

**Project:** "Synthesis, characterization and photocatalytic evaluation of cobalt ferrite nanoparticles from *Moringa oleifera*"

Part of the Certificate Course, "Exploring Nanoscience: Synthesis and Characterization of Nanoparticles".

Green synthesis of cobalt nanoparticles for the application of photocatalytic degradation.

- **August 2019:** *Department of Physics, Stella Maris College (Chennai)*

**Undergraduate Dissertation:** "Investigation on the Optical Properties of Titanium Nanoparticles in the Treatment of Waste Water"

**Guide:** Dr. Belina Xavier, Head, Department of Physics, Stella Maris College.

Sol-gel synthesis of Titanium nanoparticles for the purpose of waste water treatment through photocatalytic degradation of methylene blue dye.

## Internships and Summer Schools

July 2021	<b>IIA Summer Programme</b> <i>Conducted by:</i> Indian Institute of Astrophysics, Bangalore <i>Topics covered:</i> Solar Physics, Stars, Galaxies, ISM and IGM, Astronomical Instrumentation, Exoplanets, Cosmology
June 2021	<b>Vigyan Vidushi (VV) 2021</b> <i>Conducted by:</i> Tata Institute of Fundamental Research (TIFR), Mumbai One of around 50 women M.Sc. students selected on a pan-India basis
May 2021	<b>Introductory Summer School in Astronomy and Astrophysics</b> <i>Conducted by:</i> Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune <i>Topics covered:</i> Fundamentals of Astronomy and Astrophysics, along with recent developments in the field.
June 2018	<b>National Initiative on Undergraduate Sciences (NIUS) Camp, Batch 15.1</b> <i>Conducted by:</i> Homi Bhabha Centre for Science Education (HBCSE), TIFR, Mumbai One of around 70 students selected on a pan-India basis for an exposure-cum-enrichment camp.
May 2018	<b>Intern at International and Inter University Centre for Nanoscience and Nanotechnology (IIUCNN)</b> <i>Location:</i> Mahatma Gandhi University, Kottayam, Kerala <i>Project Report:</i> Instruments used for Studies on Polymer and Nanomaterial Systems

## Academic Highlights

- Awarded **Prime Minister's Research Fellowship** (Direct Entry, Aug 2022)
- Received Ph.D. offers from: **IISc**, IIT Madras, IISER Pune, IISER Kolkata, Raman Research Institute (Aug 2022)
- **AIR 36 (JRF)**, CSIR-NET June 2021 (out of 28135 candidates)
- **AIR 51**, GATE-PH 2022 (out of 19375 candidates)
- **AIR 198**, JEST 2022 (96.12 Percentile)
- **AIR 669**, IIT-JAM 2020 (out of 16379 candidates)
- **Gold Medalist**, M.Sc. Physics, NIT-T (Batch of 2022)
- Proficiency Award (I Rank), I Year, M.Sc. Physics, Department of Physics, NIT-T
- Alumni Award for Outstanding Student, M.Sc. Physics (2021-2022), NIT-T
- **Silver Medalist**, B.Sc. Physics, Stella Maris College (Batch of 2020)
- Dr. K.H. Rajani cash award for highest mark in Nuclear Physics (B.Sc. Physics, Batch of 2020)
- Mrs. A. Suganthi Lark Josephine cash award for highest mark in Electronics (B.Sc. Physics, Batch of 2020)
- Outgoing Student of the Year 2020, Department of Physics, Stella Maris College
- Proficiency Award - I, II and III Year, B.Sc. Physics, Stella Maris College
- School Topper - Class X (2015) and Class XII (2017), St. John's English School and Junior College

## Additional Courses and Certificates

September 2021	<b>National Spaceonova Asteroid Search Campaign</b> Citizen Science Program, Conducted by: International Astronomical Search Collaboration (IASC)
July 2021	<b>Data Driven Astronomy</b> Coursera Online Course, Conducted by: University of Sydney
April 2020	<b>Learning Physics through Simple Experiments</b> Online course, Conducted by: Indian Institute of Technology, Kanpur
August 2019	<b>Basics of Observational Astronomy, Astrophotography and Post-processing techniques</b> Two-day Workshop, Conducted by: SSN College of Engineering, Chennai, with Positron Foundation
April 2019	<b>Statistical Mechanics</b> NPTEL Online Course, Conducted by : Indian Institute of Technology, Madras
May 2018	<b>Computational Astronomy</b> One-day Workshop, Conducted by : Loyola College, Chennai

## Extra-Curriculars

Jul 2017 - Feb 2019	<b>NSS Volunteer at Adyar Cancer Institute, Chennai</b> Helped with patient file management and sorting.
Sep 2018 - Dec 2018	<b>Opinion Writer and Panelist at <i>IndianFolk.com</i></b> Wrote articles on a weekly basis; participated in Live Panel Discussions on varied topics.
2016	<b>London College of Music Examinations</b> Obtained MERIT certification in Acoustic Guitar (Grade 2) and Classical Guitar (Step 2)
2016	<b>ISRO World Space Week Quiz, 2016</b> Received "Best in XIIth" Award (conducted at Birla Planetarium, Chennai)

## Skills

Languages Known	English, Malayalam, Hindi, Tamil
Programming Languages	Python (Packages: NumPy, SciPy, Matplotlib, Pandas), C++, MATLAB
Tools	LaTeX, MS Office