

ZENIA ZURAIQ

Theoretical Physicist in the Making

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Education

Aug 2022 - Present Bengaluru, India	Doctor of Philosophy (Ph.D.) - Theoretical Physics Indian Institute of Science
Sep 2020 - Jun 2022 Tiruchirappalli, India	Master of Science (M.Sc.) - Physics; CGPA: 9.79/10 National Institute of Technology, Tiruchirappalli (NIT-T)
Jun 2017 - Aug 2022 Chennai, India	Bachelor of Science (B.Sc.) - Physics; CGPA: 9.31/10 Stella Maris College, University of Madras
May 2017 Chennai, India	Class XII Board Exam (AISSCE, CBSE); Percentage: 97.4% St. John's English School and Junior College, Besant Nagar
May 2015 Chennai, India	Class X Board Exam (AISSE, CBSE); CGPA: 10/10 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	IIA Summer Programme <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	Vigyan Vidushi (VV) 2021 <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	Introductory Summer School in Astronomy and Astrophysics <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	National Initiative on Undergraduate Sciences (NIUS) Camp, Batch 15.1 <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	Intern at International and Inter University Centre for Nanoscience and Nanotechnology (IIUCNN) <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	National Spaceonova Asteroid Search Campaign Citizen Science Program, Conducted by: International Astronomical Search Collaboration (IASC)
July 2021	Data Driven Astronomy Coursera Online Course, Conducted by: University of Sydney
April 2020	Learning Physics through Simple Experiments Online course, Conducted by: Indian Institute of Technology, Kanpur
August 2019	Basics of Observational Astronomy, Astrophotography and Post-processing techniques Two-day Workshop, Conducted by: SSN College of Engineering, Chennai, with Positron Foundation
April 2019	Statistical Mechanics NPTEL Online Course, Conducted by : Indian Institute of Technology, Madras
May 2018	Computational Astronomy One-day Workshop, Conducted by : Loyola College, Chennai

Extra-Curriculars

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