

ESSNA GHOSE

Curriculum Vitae

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Phd Candidate: Dec 2022 - Present

- **Field:** Space Science and Technology
- **Topic:** Design, Simulation and test of not-imaging space detector devoted to cosmic rays studies
- **Supervisors:** Dr. Francesco de Palma, Dr. Antonio Surdo
- **Affiliation:** University of Trento & University of Salento

PROFESSIONAL EXPERIENCE

Junior Adaptive Optics Specialist

March 2020-Dec 2022

Arcetri Observatory, National Institute for Astrophysics (INAF)

Advisor: Dr. Enrico Pinna (PI)

DUTIES:

- Participated and gave a talk ("Soul at LBT") at the NYRIA Workshop (Network for Young Researchers in Instrumentation)
- **Published paper:**
 - Astronomy and Astrophysics journal - "The SOUL view of IRAS 20126+4104 Kinematics and variability of the H2 jet from a massive protostar"
 - Astronomy and Astrophysics journal - "Orbital and dynamical analysis of the system around HR 8799 - New astrometric epochs from VLT/SPHERE and LBT/LUCI"
- **Contributed talk** - "The current status of SOUL at LBT", ADONI, Teramo, Italy 24-26 May 2022
- **Brief description of my project:**
- SOUL Upgrade at LBT (Single Conjugate Adaptive Optics Upgrade at the Large Binocular Telescope, Arizona, USA) - is the first-generation instrumental upgrade at LBT and the only unique single-conjugate adaptive optics (SCAO) system where the pyramid wavefront-sensor (PyWFS) along-with a new electron-multiplication gain detector and an adaptive secondary mirror are working together. This approach will further be adopted by many of the SCAO systems in the next-generation Extremely Large Telescopes (ELTs).
- Responsibilities: performing data-reductions to monitor the operations of the telescope, in all the phases of commissioning. My main research topic was studying the optical gain of the pyramid wavefront sensor. In parallel to these tasks, I also trained with the AO team members on adaptive-optics, coding, control systems and optical-lab activities.
- Involved in setting-up and working on the test-bench of LIFT WFS (Linearized Focal Plane Technique-Wave-Front sensor) for the GMT (Giant Magellan Telescope).

SOFTWARE SKILLS & PERSONAL SKILLS

- **Programming Skills:** IDL (Basic), Python (Basic), MATLAB (Basic), Linux (Basic), C++ (Basic)
- **Languages:** English (Excellent), Italian (Fluent), French (A2), Bengali (native)
- **Leadership skills:** Elected Class Representative of ISU-served as a delegate to meet the Board of Directors of ISU to communicate grievances of students. Experience in working with individuals of different nationalities at ISU

OTHER PROFESSIONAL EXPERIENCES

Internship **Oct-Nov 2018**
Royal Observatory of Belgium, Brussels, Belgium

- Involved in developing the laboratory (vacuum chamber) for testing the MAJIS instrument.

Internship as a part of my M.Sc studies in France **May-Aug 2018**
Advanced Mechanical and Optical Systems (AMOS), Liege, Belgium

- Creation of a detailed list of ground-based telescopes for refurbishment purposes as a potential business scope for the company.

Teacher **2015-2017**
St. Joseph's Convent, Chandannagar, India

- Taught physics, chemistry, and mathematics in middle school for an all- girls school.
- Involved in mentoring, creating motivation and awareness in young girls in STEM.

EDUCATION AND TRAINING

M.Sc. in Space Studies **2017-2018**
International Space University (ISU), Strasbourg, France

1. Thesis: Shock Tube

Thesis Advisor: Dr. Prof. Hugh Hill.

- Responsible for calibrating the Shock Tube which involves testing the communications network and analysing the results between the sensors of the Shock tube, Oscilloscope and Electric supply.
- Documentation of the procedure of the set-up along-with initial to-do experiments, precautions, and scope for further experiments.

2. Team Project: Integrated Systems of Telecommunications (International Astronautical Congress, 2018, Bremen)

- A part of the research team for 'Deep Space Network (DSN) Communications' on the present ground-based stations and the communication network amongst them and presented a talk on the same.

3. Hydra Project: The first art project to go to International Space Station (ISS)

- Electroplating and soldering on the components and silver coating of the hardware.

4. Remote Sensing

- The course involved studying the importance of remote-sensing methods and analysis of the Copernicus data to study climate change and environment.

M.Sc. in Physics (3 semesters) **Sep 2013–Feb 2015**
West Bengal State University, India

Completed all the courses of theoretical physics with a special course on astronomy and astrophysics.

Diploma in Human Rights, Jadavpur University, Kolkata, India
2012-2013

Thesis: Effects of drugs on Teenagers

Investigated the signs, causes and effects of addiction in different parts of India and provided possible effective recommendations for the same.

B.Sc with a Major in Physics, Fergusson College, Pune University, India
2009-2012

Thesis: Application of Virtual Observatory Tools in India (VOI)

Thesis Advisors: Dr. Ajit Kembhavi (IUCAA, Pune, India), Prof. Raka Dabhade (Fergusson College).

Studied Photometry, Image Reduction and Analysis Facility (IRAF) and VOI and used python to learn data-reduction techniques

SCHOLARSHIPS

- 75% scholarship - MSc in Space Studies at ISU (International Space University, France)
- 100% scholarship - internship in AMOS, Liège, Belgium (Grand Est scholarship, France)
- 100% scholarship - Radio Astronomy Winter School (IUCAA-NCRA, India)
- 100% scholarship - 34th Refresher Course on Experimental Physics (Indian Academy of Sciences, India)
- 100% scholarship – Southern Hemisphere Space Studies Program (SH-SSP), Adelaide, Australia (International Space University, France)

CONFERENCES AND WORKSHOPS ATTENDED

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| ● Astrobigné talk - OAA, Firenze, Italy | 20 Dec, 2022 |
| ● NYRIA Workshop, Sarcedo, Italy | 7-9 Nov, 2022 |
| ● Wavefront Sensor Conference, Porto, Portugal | 19-22 Oct, 2022 |
| ● ADONI conference, Teramo, Italy | 24-26 May 2022 |
| ● Adaptive Optics Summer school, UC Santa Cruz, USA (Remote) | 16-20 Aug 2021 |
| ● Wavefront Sensing in the VLT/ELT era VII, Valparaiso, Chile (Remote) | 1-3 Dec 2021 |
| ● Wavefront Sensing in the VLT/ELT era V, Nice, France (Remote) | 13-15 Oct 2020 |
| ● Moon Village Association, Strasbourg, France | 1-3 Nov 2017 |
| ● Radio Astronomy Winter School , Pune, India | 26 Dec 2011–2 Jan 2012 |
| ● 34th Refresher Course on Experimental Physics, Bangalore, India | 2-17 Dec 2011 |
| ● Summer Internship on Tensors and General Relativity, Kolkata, India | May-June 2011 |
| ● Frontiers in Physics , Pune, India | 7-8 Feb 2011 |