

# ADITHYA A RAO

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## Education

### 5-year Integrated MSc | *Physics*

National Institute of Technology, Surat, India

2019 - 2024

- Masters Thesis - *Gribov Problem and Stochastic Quantization*
- Advisors - Prof. Laurent Baulieu & Dr. Vikash K. Ojha
- CGPA - 9.77 /10 ( $\equiv$  97.7%)
- University Gold Medalist

### High School | *Physics, Chemistry, Mathematics, Computer Science*

Karnataka State Board of Secondary Education

2017 - 2019

Jnanaganga PU College, Udupi

- Grade - 97.5%
  - Rank - 10 in Karnataka
  - Top 1 percentile in India
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## Publications

V. K. Ojha, **A. A. Rao**, and S. D. Pathak, “Estimating the Age of Universe via Scalar Field,” in Proceedings of the XXV DAE-BRNS High Energy Physics (HEP) Symposium 2022, 12-16 December, Mohali, India, vol. 304, S. Jena, A. Shivaji, V. Bhardwaj, K. Lochan, H. K. Jassal, A. Joseph, and P. Khuswaha, Eds., Singapore: Springer Nature Singapore, 2024, pp. 1015-1016. [doi:10.1007/978-981-97-0289-3\\_272](https://doi.org/10.1007/978-981-97-0289-3_272).

V. K. Ojha, **A. A. Rao**, and S. D. Pathak, “Interacting tachyonic scalar field II,” 2023, [doi: 10.48550/ARXIV.2305.00277](https://doi.org/10.48550/ARXIV.2305.00277). (arXiv Preprint)

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## Conference Presentations

V. K. Ojha, **A. A. Rao**, and S. D. Pathak. (2022), “*Estimating the Age of Universe via Interacting Tachyonic Scalar Field*”. XXV DAE-BRNS High Energy Physics Symposium 2022. Poster presentation.

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## Honors and Awards

**2024** Young Scientist Participant, 73rd Lindau Nobel Laureate Meeting in Physics, one of 640 international young scientists.

**2023** DAAD-WISE award, fully funded research project at FSU Jena, one of 130 Indian students.

**2021** IASc, INSA, NASI - SRFP award, fully funded research project at PRL Ahmedabad, one of 100 Indian students.

**2019** Department of Science and Technology, Government of India - INSPIRE award, for exceptional performance in high school examinations. Awarded to top 1% students of the country.

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## Relevant Technical Skills

**Programming Languages:** C++, C, MATLAB, FORTRAN, Python (PyTorch, NumPy, SciPy, Keras), ROOT

**Computer Algebra Systems:** Mathematica, SymPy

**Typesetting Tools:** L<sup>A</sup>T<sub>E</sub>X, Microsoft Office

**Version Control:** Git, GitHub

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## Research Projects

**Gribov Ambiguity and Stochastic Quantization (Master's Thesis)** [Aug 2023 - May 2024]

*Supervisor:* Prof. Dr. Laurent Baulieu, Sorbonne University, Paris & Dr. Vikash K. Ojha, SVNIT, Surat.

*Links:* [[Thesis](#)][[Certificate](#)]

**BFSS Model on the Lattice (DAAD-WISE project)** [May 2023 - Jul 2023]

*Supervisor:* Dr. habil. Georg Bergner, Friedrich-Schiller-Universität Jena, Germany

*Links:* [[Project](#)]

**Particle Dark Matter: Existence And Constraints** [May 2022 - Jul 2022]

*Supervisor:* Dr. Ranjan Laha, Center for High Energy Physics, Indian Institute of Science, Bangalore, India.

*Links:* [[Certificate](#)]

**Lepton Oscillations (IASc, INSA, NASI - SRFP project)** [Jun 2021 - Dec 2021]

*Supervisor:* Prof. Srubabati Goswami, Senior Professor, Physical Research Laboratory (PRL), Ahmedabad, India.

*Links:* [[Report](#)][[Certificate](#)]

**Statistical and Thermodynamic properties of Quark Gluon Plasma** [Apr 2021 - Jun 2021]

*Supervisor:* Dr. Arvind Kumar, Dr. B R Ambedkar National Institute of Technology, Jalandhar, India.

*Links:* [[Report](#)]

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## Institute Mini-Projects

Research conducted as a part of the *mini-project* in the course curriculum.

**Interacting Tachyonic Scalar Field as Dark Energy Candidate** [Aug 2022 - Dec 2022]

*Supervisor:* Dr. Vikash K Ojha, Sardar Vallabhbhai National Institute of Technology, Surat, India.

*Links:* [[Preprint](#)]

**Magnetic Monopoles** [Jan 2022 - Apr 2022]

*Supervisor:* Dr. Vikash K Ojha, Sardar Vallabhbhai National Institute of Technology, Surat, India.

*Links:* [[Report](#)]

**Dynamical Symmetries of the Kepler System** [Aug 2021 - Dec 2021]

*Supervisor:* Prof. K N Pathak, Sardar Vallabhbhai National Institute of Technology, Surat, India.

*Links:* [[Report](#)]

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## Talks Delivered

### Effects of Extra Dimensions on Force Fields and Particles

Delivered to physics and math undergraduate students as a part of the Quanta Seminar series conducted by the Department of Physics, NIT Surat, on 27th August 2022.

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## Outreach Activities

**2021-22 Head, [Physics Club of NIT Surat](#)** (Member 2020-24), a club actively conducting events to impart knowledge and inculcate interest in physics in the young minds and the general public. (I also created the website for the club)

**2020- Author, [thehavok.com](#)**, writing science articles to make the scientific jargon accessible to even a non-academic.