Ayush Singh ayush.singh@niser.ac.in
School of Physical Sciences
National Institute of Science Education and Research, Bhubaneswar

Education

- **National Institute of Science Education and Research** Bhubaneswar, OD
  Integrated Master's, (Current CGPA: 9.01) *July 2017 – May 2022*
  - Relevant Coursework
    * Physics: Quantum Field Theory, Condensed Matter Physics, Statistical Mechanics, Atomic Physics, Computational Physics, Quantum Mechanics, Classical Mechanics, Special Relativity, Electromagnetism, Nuclear Physics
    * Mathematics: Real Analysis, Metric Spaces, Group Theory, Differential Equations
    * Computer Science: Theory of Computation, Algorithms and Data Structures, Discrete Structures in Computation
- **Delhi Public School International** Ghaziabad, UP
  All India Senior Secondary Certificate Examination, (with 94.6% aggregate) *May 2017*
  - Subjects taken: Mathematics, Physics, Chemistry, Economics, English
- **Delhi Public School International** Ghaziabad, UP
  All India Secondary School Examination, (with 10 CGPA) *May 2015*
  - Subjects taken: English, Hindi, Mathematics, Science, Social Sciences

Academic Experience

- **Sixth Semester Project on Cyclic Quantum Heat Engines** Bhubaneswar, OD
  National Institute of Science Education and Research *January – May 2020*
  - Project guide: Dr. Colin Benjamin, School of Physical Sciences, NISER
  - Project outline: Entropy and information; Maxwell's demon; Szilard engine; Landauer's principle; multi-particle quantum Szilard engine; quantum analogs of isothermal, isochoric, adiabatic, isobaric processes; quantum versions of the Carnot, Otto, Diesel, and Brayton engine cycles; magnetically driven quantum heat engine based on a GaAs quantum dot.
- **Summer Reading Project on Lie groups and Lie algebras** Mumbai, MH
  Indian Institute of Technology Bombay *May – July 2019*
  - Project guide: Dr. Sanjoy Pusti, Department of Mathematics, IIT Bombay
  - Topics covered: Metric topology, topological groups, Lie algebras, Baker-Campbell formula, irreducible representations of $\mathrm{sl}(2;\mathbb{C})$.
- **National Initiative on Undergraduate Science** Mumbai, MH
  Homi Bhabha Center for Science Education, TIFR *June 2018*
  - Attended a series of lectures on quantum mechanics, quantum computation, astronomy, and many-body physics.

Student Projects

- **Coding Club** Bhubaneswar, OD
  National Institute of Science Education and Research
  - Spring 2021: Helped organize a series of interactive sessions on introductory *machine learning*.
  - Fall 2019: Organized a series of student seminars on *quantum computation and quantum information*.
  - Fall 2019: Organized a hackathon on reverse engineering a web API.
  - Spring 2019: Helped organize an introductory series of student seminars on algorithms.
  - Spring 2019: Gave a student seminar on *Divide and Conquer algorithms*.
- **Software Development Group** Bhubaneswar, OD
  National Institute of Science Education and Research
  - Have been one of the founding members of the Software Development Section of the institute.
  - Helped build a directory of things lost and found on the campus.
  - Helped build a platform for holding coding contests.

Skills

Programming: Proficiency in C/C++, Python, Julia, Bash scripting. Familiarity with web development: frontend with CSS and vanilla JavaScript, backend with Django and Flask. I also have some experience building machine learning models with Keras, Flux, Scikit-Learn.