

Ashish Panigrahi

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About me

I am a 4th year physics student studying at the **National Institute of Science Education and Research, Bhubaneswar, India**. I am interested in quantum physics & quantum computing with its application in the field of science and technology.

Nationality: Indian

Education

- **National Institute of Science Education and Research (NISER)** Bhubaneswar, India
Integrated Master's (CGPA till 6th semester: 9.13/10.0) 2018 - 2023
- **Maharishi Vidya Mandir Senior Sec. School** Chennai, India
All India Senior Secondary Certificate Examination (CBSE) - 95.6% May 2018
- **PSG Public School** Coimbatore, India
All India Secondary School Examination (CBSE) - CGPA 10 May 2016

Honors/Awards

- **IBM Qiskit Advocate** 2021
IBM Quantum
 - Selected from a pool of global applicants.
 - This achievement depicts a deep level of understanding with Qiskit including circuits, algorithms, simulators, qubits and noise.
 - Through my contributions to the Qiskit and the quantum community, I have demonstrated an ability and commitment to educate and influence others by sharing ideas, knowledge and expertise in the field of quantum computing.
- **National Graduate Physics Examination (National topper)** 2020
Indian Association of Physics Teachers
 - Secured a score within the top 118 students among 12,000 candidates in the country.
- **Department Topper (1st & 2nd year)** 2018-2020
School of Physical Sciences, NISER
- **Kishore Vaigyanik Protsahan Yojana** 2017
Indian Institute of Science Bengaluru, India
 - A prestigious fellowship program funded by the *Department of Science and Technology* of the Government of India.
- **National Talent Search Examination** 2016
National Council of Education Research and Training New Delhi, India
 - A national level scholarship program offered by the Government of India.
 - It is one of the oldest and most prestigious scholarship programmes in the country.

Academic exposure

- **Qiskit Global Summer School** Virtual
IBM Quantum July-August 2020

- An intensive 2 week virtual summer school on quantum computation and designing quantum circuits and algorithms using Qiskit.
- Did hands-on coding exercises to learn various quantum algorithms, pulse level control of qubits and concepts in quantum chemistry.
- Also did a project on simulating the ground energy level of LiH molecule using quantum variational eigensolver.

- National Initiative on Undergraduate Science (Physics)**

Mumbai, Maharashtra

Homi Bhabha Centre for Science Education, TIFR

June 2019

 - Selected as one of top 70 students in the country to participate in this camp.
 - An extensive 12-day course containing lectures, independent lab work and a field trip for 2 days.
 - Lecture series on quantum mechanics, quantum information theory and quantum computation, basic condensed matter physics, many body physics, astronomy and astrophysics.
 - About 30 hours of independent lab work.

Project experience

- Sixth Semester Project**

Bhubaneswar, India

Superconducting spintronics group, NISER

April - July 2021

 - Project guide: Dr. Kartik Senapati, Reader-F, NISER
 - Worked on a semester project on the topic, "Study of spin current in NM/HM bilayer and trilayer systems".
 - The goal was to be able to detect spin current via a bilayer system involving Cu and Pt, using the method of electrical detection.
- Software Developer Internship**

Remote

Quantum Brilliance, Australia

February - April 2021

 - Project guide: Dr. Nariman Saadatmand, QBQE Product Manager
 - Worked on QB's quantum emulator (QBQE) and enhanced functionality of its QAOA module using C++.
- Summer Project**

Bhubaneswar, India

Institute of Physics, Bhubaneswar

May - June 2019

 - Project guide: Dr. Debakanta Samal, Reader-F, Institute of Physics
 - Reading project on "Study on anisotropic magnetoresistance".
 - Topics covered: Origin of magnetoresistance, theory of magnetoresistance in real metals using the 2-band charge carrier model, origin of anisotropic magnetoresistance, its applications and current research scenario in the field.

Open-source contributions

- Qiskit Textbook**

[GitHub](#)

Learn Quantum Computation using Qiskit

April 2020 - Present

 - Qiskit is IBM's software development kit for building software to interact with IBM's quantum devices and OpenQASM.
 - The textbook is equivalent to a university level course for learning quantum computation and beyond.
 - I have been an active contributor to this project with over 50+ commits since April 2020.

Licenses & Certifications

- IBM Certified Associate Developer**

IBM

Quantum Computation using Qiskit v0.2X

July 2021

- This certification demonstrates fundamental knowledge of quantum computing concepts and the ability to express them using the Qiskit open source software development kit (SDK).
- Shows experience in using the Qiskit SDK from the Python programming language to create and execute quantum computing programs on IBM Quantum computers and simulators.

- **Introduction to Quantum Computing Course**

IBM Quantum & The Coding School

Qubit by Qubit
October 2020 - May 2021

- Developed a foundational understanding of quantum computing, with topics including introductory linear algebra, coding with Qiskit, quantum mechanics, quantum algorithms, and quantum applications.

- **Challenge Fall 2020 Achievement - Intermediate**

IBM Quantum

IBM
December 2020

- Demonstrated an ability to implement near-future quantum data structures and design a quantum game solver using Grover's algorithm.
- Showed an understanding of quantum circuits, the gates that comprise such circuits, Grover's algorithm, and qRAM (quantum random access memory) as a way to implement complex data structures.

- **CS-191x: Quantum Mechanics and Quantum Computation**

University of California, Berkeley

edX
August 2020

- Coursework involved ranging from the basics of the qubit to quantum algorithms such as Grover's, Shor's etc. to the Bloch sphere and Schrödinger's wave equation.
- Final score: 97%

Volunteering

- **Project Lovelace**

Scientific programming problems

May 2021 - Present

- Project Lovelace is a platform to learn science through programming.
- Member of the team to add new problems and maintain the website (both frontend and backend).
- Website: <https://projectlovelace.net>

- **Full-Stack Quantum Computation**

Community-driven, open-source education resources

December 2020 - Present

- Part of the team as a curator of various articles on quantum technologies, submitted by volunteers.
- Website: <https://fullstackquantumcomputation.tech>

- **Mentor**

Avanti Fellows NGO

January - April 2019

- Duties included mentoring students from grades 11 and 12.
- My weekend work involved having a one-to-one discussion with students on physics and general advice on entrance exams.

Technical skills

Programming and scripting languages

C, C++, Bash, and Python (Libraries: *Scipy*, *Numpy*, *Matplotlib*, *Sympy*)

Markup languages

L^AT_EX, Markdown, Groff, HTML

Quantum Frameworks

Qiskit, QuTiP, PennyLane

General computing tools

Vim, git, tmux, gnuplot

