Shubham Jain

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Education

2021– **PhD, Physics**, *University of Maryland*, College Park.
GPA: 4.0/4.0
Advisor: Dr. Victor V. Albert

2017–2021 **Bachelor of Technology, Engineering Physics**, *Indian Institute of Technology*, Delhi.
CGPA: 9.8/10.0, Department rank: 1
Minor degree: Theoretical and computational techniques in physics

Publications

2026 **Symmetry and AI-assisted discovery of magic-state factories**
S.P. Jain, A. Wills, and S. Singh · *arXiv:2610.06535*

2026 **Quantum codes in the Lee metric**
J. Guo, Y. Han, A. Chakraborty, **S.P. Jain**, T. Liu, V.V. Albert, and A. Lucas · *arXiv:2610.04834*

2026 **Classification of generalised triorthogonal codes through length 54**
A. Wills, **S.P. Jain**, and S. Singh · *arXiv:2609.30860*

2026 **Monolithic quantum error correction in the presence of distinguishability**
S.P. Jain, E.R. Hudson, W.C. Campbell, A.V. Gorshkov, and V.V. Albert · *arXiv:2609.26946*

2026 **Quantum error correction and fault tolerance: A comprehensive tutorial**
D.J. Spencer, **S.P. Jain**, A. Tanggara, Z. Sun, T. Haug, D. Khu, and K. Bharti · *arXiv:2605.29137*

2025 **Transversal Clifford and T-gate codes of short length and high distance**
S.P. Jain and V.V. Albert · *IEEE Journal on Selected Areas in Information Theory*

2024 **Absorption-emission codes for atomic and molecular quantum information platforms**
S.P. Jain, E.R. Hudson, W.C. Campbell, and V.V. Albert · *Phys. Rev. Lett. 133, 260601*

2024 **Quantum spherical codes**
S.P. Jain, J.T. Iosue, A. Barg, and V.V. Albert · *Nature Physics 20, 1300–1305*

Research Experience

QuICS, University of Maryland, College Park.
2021–present Graduate Research Assistant supervised by *Dr. Victor V. Albert*

IBM, Yorktown Heights, New York.
Summer 2026 Quantum computing theory intern

Nanofiber Quantum Technologies (NanoQT), Tokyo, Japan.
Spring 2025 Ph.D. Research Intern

Institute of Mathematical and Statistical Innovation, Chicago, Illinois.
Fall 2024 Visiting researcher

Dahlem Center for Complex Quantum Systems, Freie Universität Berlin, Germany.
Fall 2023 Visiting researcher

Brookhaven National Laboratory, Upton, New York.

Summer 2022 Ph.D. Intern (Remote)

Indian Institute of Technology, Delhi, India.

Fall 2020 Undergraduate research thesis advised by *Dr. Pradipta Ghosh*

University of Gdańsk, Poland.

Summer 2020 Undergraduate research internhip advised by *Prof. Tomasz Paterek* and *Prof. Matthew Lake*

Talks

Mar. 2026 **APS Global Physics Summit 2026**, *Contributed talk*, Quantum Spherical Codes II.

Oct. 2025 **Asia-Pacific QEC Tutorial Series**, *Invited talk*, Tutorials on bosonic quantum error correction.

Oct. 2025 **RQS Seminar**, *Invited talk*, Absorption-Emission Codes for Atomic and Molecular Quantum Information Platforms.

Apr. 2025 **Quandela, France**, *Invited talk*, Transversal Clifford and T-gate codes of short length and high distance.

Apr. 2025 **YITP Logical Gates for Encoded Qubits Workshop, Kyoto, Japan**, *Invited talk*, Absorption-Emission Codes.

Mar. 2025 **Kyoto University Quantum Information Seminar, Kyoto University, Kyoto, Japan**, *Invited talk*, Quantum Error correction with spheres and spins.

Feb. 2025 **Tecnun Quantum Information Seminar, Universidad de Navarra, Spain**, *Invited talk*, High-distance codes with transversal Clifford and T-gates.

Oct. 2024 **QEC Journal Club, Prof. Jens Eisert's Group, FU Berlin, Germany**, *Invited Talk*, High-distance codes with transversal Clifford and T-gates .

Sep. 2024 **Theory of Quantum Computation (TQC) 2024, Okinawa, Japan**, *Contributed talk*, Quantum spherical codes.

Sep. 2024 **Nanofiber Quantum Technologies (NanoQT), Tokyo, Japan**, *Invited talk*, Quantum error correction across the Hilbert land.

Aug. 2024 **Asia-Pacific QEC Seminar**, *Invited talk*, Quantum spherical codes.

Mar. 2023 **APS March Meeting 2023**, *Contributed talk*, Error correction on molecular Platforms.

Mar. 2023 **APS March Meeting 2023**, *Contributed talk*, Error Correction Zoo, (Substitute for Albert V.).

Dec. 2022 **Molecular Quantum Technology (MQT) 2022, Puerto Natales, Chile**, *Contributed talk*, Noise in Quantum Rigid Rotors.

Mar. 2022 **APS March Meeting 2022**, *Contributed talk*, Locality of Physical Noise in Quantum Rigid Rotors.

Posters

2026 MathQuantum Annual Symposium 2026, College Park, MD.

2025 Robust Quantum Simulation (RQS) workshop, Durham, NC.

2025 MathQuantum Annual Symposium 2025, College Park, MD.

2024 Theory of Quantum Computation (TQC) 2024, Okinawa, Japan.

2024 National Science Foundation (NSF) stakeholder visit, College Park, MD.

2024 Robust Quantum Simulation (RQS) workshop, Princeton, NJ.

2023 National Science Foundation (NSF) stakeholder visit, College Park, MD.

2023 Robust Quantum Simulation (RQS) conference, College Park, MD.

2023 3rd Condensed Matter Summer School, Minneapolis, MN.

2023 Quantum Information Processing (QIP) 2023 Conference, Ghent, Belgium.

Service

Peer review, *npj Quantum Information (2), Quantum (6), IEEE (4), QIP (1), TQC (1), QSim (1), Advances in Applied Mathematics and Computing (1).*

Co-organizer, *Asia-Pacific QEC Seminars.*

Mentor, RQS REU student (2025).

Fellowships & Awards

2025 ***MathQuantum*** graduate student fellow

2022 ***Student Travel Award*** to present research at MQT 2022, Chile.

2021 ***Dean's Fellowship*** awarded by the Graduate school, University of Maryland.

2021 ***Institute Silver Medal*** awarded by IIT Delhi for highest CGPA in the Physics Department.

2020 Sole UG recipient of the ***Kalpana Chawla Scholarship*** for scientific contributions.

2020 ***Rank 13*** in the International Theoretical Physics Olympiad.

2020 ***MITACS Globalink Research Internship Award*** for conducting summer research in Canada*.

2020 ***DAAD-WISE Scholarship*** for conducting summer research in Germany*.

2018 Sole UG recipient of the ***Mudit Sharma memorial scholarship*** for Academic Excellence.

2018 ***Gold Medal*** in The University Physics Competition.

2018 ***Bronze Medal*** at iGEM (International Genetically Engineered Machine), Boston.

* revoked financial award due to COVID