Ankit Kumar

Technion - Israel Institute of Technology

Curriculum vitae

linktr.ee/ankit.hbar

Research Interests: Quantum Information Science & Technology
Computational Physics: Methods and Applications

EDUCATION & PROFESSIONAL EXPERIENCE

Postdoctoral Fellow — 10.2025 – Present
Technion - Israel Institute of Technology, Israel
Advisor: Asst. Prof. David Gelbwaser-Klimvosky

Research Assistant — 07.07.2025 – 03.10.2025
Indian Institute of Technology Roorkee, India

Postdoctoral Researcher / Adiunkt — 03.10.2023 – 19.04.2025
International Centre for Theory of Quantum Technologies, Poland
Advisor: Prof. Michał Horodecki

Ph.D. in Quantum Information Science — 02.01.2018 – 13.07.2023
Indian Institute of Technology Roorkee, India
Thesis: Entanglement Dynamics in Quantum Continuous–Variable States — arXiv:2405.07362
Advisor(s): Prof. P. Arumugam & Prof. Tomasz Paterek (Uni of Gdańsk, Poland)
Awarded with an "Outstanding" in Mathematical and Computational Techniques

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M.Sc. in Physics 9/10, Distinction — 2015 – 2017
Indian Institute of Technology Roorkee, India
Thesis: A Qualitative Study of Rotating Neutron Stars
Advisor: Assoc. Prof. P. Arumugam
Rank 10 (percentile: 99.91) in GATE, 2017 Rank 86 in CSIR-UGC JRF, June 2016

B.Sc. (H) Physics 88/100 — 2012 – 2015
Hansraj College, University of Delhi, India
Project: Designing and Optimization of Auto-Tracking Solar energy-based Energy Conversion Module . . .
Advisor(s): Asst. Prof.(s) Amit Sehgal, Sushil Kumar, & Rajan Walia [Best Innovation Idea Award]

Sr Secondary School - XI & XII 89/100 *CBSE, Baghpat 250609, India* 2010 – 2012

Secondary School – IX & X 9.4/10 *CBSE, Meerut 250501, India* 2008 – 2010

SPONSORED RESEARCH PROJECTS, FELLOWSHIPS & AWARDS

8. Publication Award for Article: CQG **41**, 245014 (2024) ↔ *Uni of Gdańsk, Poland* [PLN 640]
7. Publication Award for Letter: PRD **109**, L101501 (2024) ↔ *Uni of Gdańsk, Poland* [PLN 2250]

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6. Gravitation and Entanglement in Quantum Superpositions [MSCA Proposal 2023]
   Host: Prof. Mauro Paternostro (Queen's University Belfast, UK)
   Outcome: Marie Curie Seal of Excellence (certificate not awarded due to UK-EU Brexit legalities)

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5. Quantum Coherence and Nuclear Reactions [Jan 17 - May 31, 2019]
   Nanyang Technological University, Singapore [NTU-India Connect Research Programme]
   Advisor: Asst. Prof. Tomasz Paterek

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4. MHRD Fellowship for Doctoral studies ↔ *MHRD, Govt. of India* [Jan 2018 - Dec 2022]

3. Merit-cum-means Scholarship ↔ *IIT Roorkee, India* [2016 - 2017]

2. Designing and Optimization of Auto-Tracking Solar energy-based Energy Conversion . . . [Nov'13–Nov'14]
   Dept. of Electronics, Hansraj College, Uni of Delhi, India
   PI(s): Asst. Prof.(s) Amit Sehgal, Sushil Kumar, & Rajan Walia
   Funding: INR 350,000 ↔ Innovation Project HR-207 ↔ **Best Innovation Idea** award

1. Central Sector Scheme Scholarship (CSSS) ↔ *CBSE & MHRD, Govt. of India* [2012-2016]

TEACHING

3. "Introduction to Quantum Mechanics" for Postgraduates [Oct 2024 - Feb 2025]
   University of Gdańsk, Poland

2. Teaching assistant in "Experimental Physics for specially-abled students" [2020]
   Indian Institute of Technology Roorkee, India

1. Teaching assistant in Computational Physics (FORTRAN & Python) [2019-2022]
   Indian Institute of Technology Roorkee, India

LIST OF PUBLICATIONS

8. Micromagnons and long-range entanglement in ferrimagnetic ground states
   Marcin Wiésniak, Ankit Kumar, and Idriss H.N. Ngueya
   Phys. Rev. B **112**, 134425 (2025)

7. Open quantum dynamics of Josephson charge pumps
   Ankit Kumar, L. Cort, M. Łobejko, Alejandro Jenkins, Michał Horodecki
   New Journal of Physics **27**, 104503 (2025)

6. Correlations and signaling in the Schrödinger-Newton model
   J.A. Gruca & Ankit Kumar, R. Ganardi, P. Arumugam, K. Kropielnicka, Tomasz Paterek
   Class. Quantum Grav. **41**, 245014 (2024)

5. Probing Modified Gravity with Entanglement of Microspheres
   Ankit Kumar, Yen-Kheng Lim, P. Arumugam, Tom Złosńik, Tomasz Paterek
   Phys. Rev. D **109**, L101501 (2024) Letter

4. Continuous-variable entanglement through central forces: application to gravity between quantum masses
   Ankit Kumar, Tanjung Krisnanda, P. Arumugam, Tomasz Paterek
   Quantum **7**, 1008 (2023)

3. Pasta properties of the neutron star within effective relativistic mean-field model
   V. Parmar, H.C. Das, A. Kumar, Ankit Kumar, M.K. Sharma, P. Arumugam, S.K. Patra
   Phys. Rev. D **106**, 023031 (2022)

2. Constraining the parameterized neutron star equation of state with astronomical observations
   Jaikhomba Singha, S.M. Vaneshwar, Ankit Kumar
   Res. Astron. Astrophys. **23**, 055001 (2022)

1. Nonclassical trajectories in head-on collisions
   Ankit Kumar, Tanjung Krisnanda, P. Arumugam, Tomasz Paterek
   Quantum **5**, 506 (2021)

SELECTED PRESENTATIONS

12. Energy conservation on quantum computing — Invited Talk
NIT Delhi, India ↔ STC Worskhop on Silicon to Systems — 27 Aug 2025

11. Open system modeling for Josephson junction based nanodevices — Invited Talk
IIT Roorkee, India ↔ IPA Lecture Series — 07 Aug 2025

10. An open system approach to superconducting nanodevices — Invited Talk
Xiamen University, Malaysia — 04 Oct 2024

9. Current pumping with an unbiased SQUID — Poster
Uni of Maryland, USA ↔ QTD Conference 2024 — 05-09 Aug 2024

8. Entanglement tests of gravity at quantum length scales — Poster
Uni of Gdańsk, Poland ↔ KCIK Symposium on Quantum Information — 16-18 May, 2024

7. Probing Modified Gravity with Entanglement of Microspheres — Talk
Uni of Gdańsk, Poland ↔ Quantum Speedup Conference 2023 — 20-22 Nov 2023

6. Using Matrices to Solve the Time-Dependence of Quantum States — Invited Talk
FCRIT - Uni of Mumbai, India ↔ STTP Workshop on Quantum Computing — 14 Jan 2023

5. Millisecond Pulsars: astrophysics Course for undergraduate students — Invited Talk
Xiamen University, Malaysia — 19 Dec 2022

4. Entanglement based precision test of gravitational coupling at quantum length scales — Talk
NTU, Singapore ↔ IPS Meeting 2022 — 28-30 Sep 2022

3. Computing gravity-mediated quantum entanglement in continuous variable bipartite states — Talk
IIT Roorkee, India ↔ ISRACAM Conference 2022 — 20-24 Jun 2022

2. Quantum Dynamics of Fundamental Interactions — Invited Talk
Chhatrasal Govt. PG College, India ↔ National Webinar on Quantum Mechanics — 19 Jan 2021

1. Closest approach of a quantum projectile — Talk
Alagappa University, India ↔ ICMMCMSE Conference 2022 — 22-24 Jan 2022

ACADEMIC REFEREES

- Prof. Michał Horodecki — michal.horodecki@ug.edu.pl
  International Centre for Theory of Quantum Technologies, University of Gdańsk, Poland
- Prof. Tomasz Paterek — tomasz.paterek@ug.edu.pl
  Institute of Theoretical Physics and Astrophysics, University of Gdańsk, Poland
- Prof. Paramasivan Arumugam — arumugam@ph.iitr.ac.in
  Department of Physics, Indian Institute of Technology Roorkee, India