Atul Singh Arora

Personal

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Research

Current — PhD Thesis, Université libre de Bruxelles (ULB), Belgium
Quantum Cryptography and Communication
Advisor: Prof. Jérémie Roland
Recently solved an interesting problem about quantum weak coin flipping, a cryptographic primitive. Started studying for the next project, quantum communication complexity. On the side, have been investigating foundational aspects of quantum mechanics.
A.S.A., S. Weis, J. Roland. arXiv:1811.02984 (accepted at QIP; sumbitted to STOC)
K. Bharti, A.S.A, L. C. Kwek, J. Roland. arXiv:1811.05294 (submitted to PRL)

2015-16 — Master's Thesis, Indian Institute of Science Education and Research (IISER), Mohali, India
Contextuality in a Deterministic Quantum Theory
Advisor: Prof. Arvind
Concluded that contextuality is not a necessary feature of quantum mechanics and proposed an alternative, non functional-conistency, bolstered by an explicit construction.
A.S.A., K. Bharti, Arvind. arXiv:1607.03498 (submitted to Physics Letters A)

Summer 2015 — Intern, University of Siegen, Germany
Towards a macroscopic test of local realism
Advisor: Prof. Otfried Gühne
Constructed a Bell inequality using observables bounded in phase space to probe local realism using macroscopic variables.
A.S.A., A. Asadian. Phys. Rev. A 92, 061207

2011-14 — Intern, worked on yarn defect recognition using OpenCV at Indian Institute of Technology (IIT), Bombay under the supervision of Prof Anirban Guha; worked on setting up an experiment to study the dynamics of a dipole lattice at the National Physical Laboratory (NPL), New Delhi, India under the supervision of Dr Ravi Mehrotra; worked on quantum simulation at IISER Mohali, India under the supervision of Prof Arvind;

Education

present Oct 2016 — Doctorat en Sciences de l'ingénieur et technologie,
Université libre de Bruxelles (ULB), Belgium.

July 2016 July 2011 — Bachelor and Master of Science with Physics major,
Indian Institute of Science Education and Research (IISER), Mohali, India.
CPI: **9.4** /10. Graduated with *rank two*. | Details at the end

Recognition

Dec 2016	Two year research fellowship from the Belgian *FNRS (Fonds National Recherche de Science)*, through the FRIA grant.
2016	Top 5% in the physics stream of the *Graduate Aptitude Test in Engineering (GATE)*, India. Obtained a 92.3 percentile in the national graduate physics exam, *Joint Entrance Screening Test (JEST)*, India.
2015	Awarded the *Junior Research Fellowship (JRF-NET)* from the Council of Scientific and Industrial Research, India. Awarded the *DAAD WISE* fellowship for a summer internship by and in Germany.
2013-16	Awarded the Certificate of Merit for the best academic performance in a semester, twice by IISER. Was among the highest scorers four other times.
2012	Awarded the *KVPY* fellowship for my work on Stepper Motor Control, by DST, India.
2010	Granted financial support for attending the Bright Green Youth climate summit, Denmark.

Languages

Hindi:	Fluent
English:	Fluent
Punjabi:	Intermediate
French:	Basic

Teaching

2019	(scheduled) Teaching Assistant. Information Quantique (graduate). ULB, Brussels.
2016	Teaching Assistant. Thermodynamics (undergraduate). IISER, Mohali.
2015	Teaching Assistant. Classical Mechanics (undergraduate). IISER, Mohali.

Conferences

2018	QuantAlgo Workshop, Université Paris-Diderot, Paris. Talk. *Quantum Weak Coin Flipping beyond bias 1/6*.
2018	QIP, TU Delft. Poster. *Quantum Weak Coin Flipping with bias 1/10*.
2017	TQC, Paris. Attended.

Interests

Technology, Open-Source, Programming;
Philosophy—Ethics, Books—non-fiction;
Fitness; Piano, Guitar.

Bachelor and Master of Science with a major in Physics

Semester*	Subjects	Score
1	Mechanics, Chemistry of elements and chemical transformations, Cellular basis of life, Symmetry, Language skills B (English), Introduction to computers, Physics lab I, Chemistry lab I, Biology lab I	8.5/10
2	Electromagnetism, Atoms molecules and symmetry, Gene expression and development, Analysis in one variable, Hands-on electronics, History of science, Physics lab II, Chemistry lab II, Biology lab II	8.6/10
3	Waves and optics, Spectroscopic and other physical methods, Genetics and evolution, Curves and surfaces, Introduction to astrophysics, Workshop training, Physics lab III, Chemistry lab III, Biology lab III	8.8/10
4	Thermodynamics and statistical physics, Energetics and dynamics of chemical reactions, Behaviour and ecology, Probability and statistics, Introduction to quantum physics, Philosophy of science, Physics lab IV, Chemistry lab IV, Biology lab IV	9.7/10
5†	Classical mechanics, Quantum mechanics, Electrodynamics, Advanced optics lab, Reason and rationality	10/10
6	Statistical mechanics, Atomic and molecular physics, Quantum computation, Advanced electronics and instrumentation lab, Quantum field theory	9.6/10
7	Solid state physics, Nuclear and particle physics, Nuclear physics lab, Physics of fluids, Quantum principles and quantum optics, Radiative effects and renormalisation group in relativistic quantum field theory	9.4/10
8	Nonlinear dynamics, Chaos and complex systems, Condensed matter physics lab, computational methods in physics, Standard model and beyond, Selected topics in classical and quantum mechanics	9.5/10
9	Ethics, MS Thesis—Research project I	10/10
10	Cosmology and galaxy formation, MS Thesis—Research project II	10/10
	Cumulative Performance Index (CPI)	**9.4** /10

∗ Note that the credits associated with each semester are not exactly the same.

† Physics major henceforth.