Arnab Chakrabarti

Scientist · Postdoctoral Fellow
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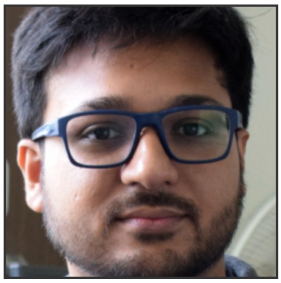

Objective

To introduce young minds to the joys of Physics.

Summary

Passionate scientist with 8+ years of research experience in Quantum Physics. Made fundamental theoretical and experimental contributions in the fields of Open Quantum Systems and Nuclear Magnetic Resonance Spectroscopy. Reviewer of top international Physics journals including Physical Review Letters. Interested in a career of teaching Physics to college students, since they are full of fresh ideas and new possibilities.

Work Experience

Postdoctoral Research

Feb. 2019 - Present

- Developed a novel protocol for the loss-less transport of trapped impurity atoms in a dissipative cold medium
- Collaborated with top scientists in developing the theory Anti-Zeno cooling of spin baths.
- Participated in writing collaborative research proposals.

Doctoral Research

Aug. 2013 - Dec. 2018

- Spearheaded the development of a new formalism of the Quantum Master Equation, which we now call as the Fluctuation Regulated Quantum Master Equation (FRQME).
- Developed and performed novel experiments based on Nuclear Magnetic Resonance (NMR) Spectroscopy to validate the predictions of FRQME.
- Found the optimal Dynamic Decoupling protocol for suppressing non-stationary phase noise.
- Organized Departmental Seminars and Journal Clubs.

Journal Refereeing:

2019 - Present

- Physical Review Letters (APS)
- Physical Review E (APS)
- Physical Review Research (APS)
- Entropy (MDPI)

Teaching Assistant-ship

2013 - 2014

- Intermediate Classical Mechanics (Autumn, 2013)
- Intermediate Quantum Mechanics (Autumn, 2013)
- Thermal Physics (Spring, 2014)

Student Representation

2016 - 2017

- Departmental Student Representative for Ph.D. students of the Department of Physical Sciences, IISER Kolkata.

Education

Weizmann Institute of Science

Rehovot, Israel

Postdoctoral Fellow, AMOS and Department of Chemical and Biological Physics

Feb.2019. 2010 - Present

- Prof. Gershon Kurizki's Group

Indian Institute of Science Education and Research Kolkata

Mohanpur, Nadia, West Bengal, India

Ph.D. in Physical Sciences

Aug. 2013 - Dec. 2018

- Prof. Rangeet Bhattacharyya's Group
- As a part of the Integrated Ph.D. program of the institute.

Indian Institute of Science Education and Research Kolkata

Mohanpur, Nadia, West Bengal, India

M.S. in Physical Sciences

Aug. 2011 - Jul. 2013

- *Grade: 8.31 (Out of 10)*
- As a part of the Integrated Ph.D. program of the institute.

Techno India, West Bengal University of Technology — *Salt Lake, Kolkata, West Bengal, India*

B.Tech. in Electronics and Communication Engineering — *Jul. 2007 - Jul. 2011*

- *Grade: 9.11 (Out of 10)*

Awards & Honors

International

2019 **Feinberg Graduate School Postdoctoral Fellowship**, Weizmann Institute of Science — *Israel*

Domestic

2017 **Senior Research Fellowship**, CSIR — *India*
2013 **Junior Research Fellowship**, IISER Kolkata — *India*
2011 **Integrated PhD Fellowship**, IISER Kolkata — *India*
2013 **NET-LS in Physical Sciences**, CSIR-UGC — *India*
2011 **GATE in Electronics and Communication Engineering**, — *India*

Presentation

21^{st} Conference of National Magnetic Resonance Society, India: NMRS-2015 — *Guru Nanak Dev University, Amritsar, India.*

Oral Presentation — *Mar. 2015*

- Title: *Performance of Uhrig's Dynamic Decoupling Sequence in Suppressing Decoherence due to Translational Diffusion*

24^{th} Conference of National Magnetic Resonance Society, India: NMRS-2018 — *IISER Mohali, Mohali, India.*

Oral Presentation — *Mar. 2018*

- Title: *How Fast Do Nutations Decay?*

Unmasked - Open Quantum Systems in the Golan, Israel — *The Hebrew University of Jeruslem, Israel*

Poster Presentation — *May 2021*

- Title: *Quantum Transport Control in Dissipative Systems*

Computing skills

Programming experience in

- Matlab
- Mathematica
- Julia

Publications

1. *Quantum master equation with dissipators regularized by thermal fluctuations*, **Arnab Chakrabarti** and Rangeet Bhattacharyya, Phys.Rev.A., **97**, 063837, (2018).
2. *Non-Bloch decay of Rabi oscillations in liquid state NMR*, **Arnab Chakrabarti** and Rangeet Bhattacharyya, Europhys. Lett., **121**, 57002, (2018).
3. *Dynamic decoupling in the presence of 1-D random walk*, **Arnab Chakrabarti**, Ipsita Chakraborty and Rangeet Bhattacharyya, J. Stat. Mech. Theory Exp., **2016**, (05) 053210, (2016).
4. *Enhancement of the accuracy of determination of transverse relaxation time in solution state NMR spectroscopy by using Uhrig's dynamic decoupling sequences*, Ipsita Chakraborty, **Arnab Chakrabarti** and Rangeet Bhattacharyya, Phys. Chem. Chm. Phys., **17**, 32384, (2015).

5. *Recent studies on accurate measurements of NMR transverse relaxation times*, Rangeet Bhattacharyya, Ipsita Chakraborty, **Arnab Chakrabarti** and Swagata Mandal, Annu. Rep. NMR Spectrosc., **99**, 57, (2020).

Preprints

1. *Creation of long-lived states in interacting spins coupled to a thermal bath*, **Arnab Chakrabarti** and Rangeet Bhattacharyya, arXiv:1911.07607 (2019).
2. *Nonadiabatic control of quantum transport fidelity in dissipative cold media*, **Arnab Chakrabarti**, Igor Mazets, Tian-Niu Xu, Xi Chen and Gershon Kurizki, arXiv:2109.13647 (2021).

Conferences, Workshops and Schools

Impurity Spins for Quantum Information and Technologies 2019
Bar Ilan University, Safed, Israel
Sep. 2019

22^{nd} Conference of National Magnetic Resonance Society, India: NMRS-2016
IIT Kharagpur, Kharagpur, India.
Feb. 2016

Bangalore School on Statistical Physics
RRI, Bangalore, India
Mar. 31 - Apr. 12, 2014

Introductory Summer School on Astronomy and Astrophysics
IUCAA, Pune, India
May 7 – Jun. 8, 2012