


Sayan Ghosh

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IISER Kolkata

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RESEARCH INTEREST

Microscopy, polarimetry, spin-orbit interaction of light, interferometry, quantum optics, topological photonics and non-hermitian physics

ACADEMIC BACKGROUND

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH KOLKATA

2018 - present

Mohanpur, West Bengal, India

B.S. M.S. Dual Degree (Expected in May 2023)

Physics Major • CGPA 9.37

MASTER'S PROJECT PLAN

SLM based pulse shaper

2022 - 2023

Supervisor: *Dr. Gregor Weihs, University of Innsbruck*

Dr. Nirmalya Ghosh, IISER Kolkata

University of Innsbruck

Summary: Implementation of an automated SLM-based pulse shaper to be used in generating entangled photon pairs from quantum dot

OTHER PROJECTS

Fourier imaging microscopy (ongoing)

2022

Supervisor: *Dr. Nirmalya Ghosh, IISER Kolkata*

IISER Kolkata

Summary: An imaging technique to obtain phase and polarization contrast image by manipulating Fourier plane image

Realizing non-hermitian dynamics through optical beam shifts (ongoing)

2022

Supervisor: *Dr. Nirmalya Ghosh, IISER Kolkata*

IISER Kolkata

Summary: Formulation of the theory of optical beam shifts in the context of PT symmetric non-hermitian physics

Topological photonics with ring resonators (ongoing)

Summer 2022

Supervisor: *Dr. Avik Dutt, University of Maryland*

University of Maryland

Summary: Realization of a topological Floquet band in a ring resonator system and its application

Study of polarization in quantum optics

Summer 2021

Supervisor: *Dr. Nirmalya Ghosh, IISER Kolkata*

IISER Kolkata

Summary: A Study of polarization operators (Stoke's operators) and their conjugates

Leggett-Garg inequality in open quantum systems

Summer 2020

Supervisor: *Dr. Sourin Das, IISER Kolkata*

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Summary: A Study of Leggett-Garg inequalities (LGI) and violation of LGI in open quantum systems

Weak Measurement with light

Summer 2019

Supervisor: *Dr. Nirmalya Ghosh, DPS, IISER Kolkata*

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Summary: Detection and study of Goos-Hänchen and Imbert-Fiodaraŭ shift of light beam with weak value amplification

Magnetoelectric effect in topological insulator (reading project)

Supervisor: *Dr. Sourin Das, IISER Kolkata*

Summary: Study of magnetoelectric effect in topological insulators and its consequences

Summer 2019

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PUBLICATIONS AND PREPRINTS

- Leggett-Garg inequality in Markovian quantum dynamics: role of temporal sequencing of coupling to bath by **Sayan Ghosh**, Anant V. Varma, Sourin Das
[arXiv:2110.10696v1](https://arxiv.org/abs/2110.10696v1)

AWARDS AND SCHOLARSHIPS

Qualified Kishore Vaigyanik Protsahan Yojana (**KVPY**) with **all India rank 3** in SB stream (2018)

- Recipient of Swami Vivekananda Merit cum Means Scholarship *2016 - 2018*
- Recipient of DST INSPIRE Scholarship for Higher Education *2018 - 2019*
- Recipient of Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship *2019 - present*

TEACHING EXPERIENCE

- Teaching assistant in Physics Laboratory 2 (PH2103) at IISER Kolkata (2021 Autumn semester)
- Teaching assistant in Physics Laboratory 2 (PH2103) at IISER Kolkata (2022 Autumn semester)

COMPUTATION SKILLS

Programming Python | C | C++ | CUDA C | Bash
Data Visualization Gnuplot | Matplotlib
Typesetting LaTeX

OTHER ACTIVITIES

- Participated in Students' Science Seminar Harnessing Light: Possibilities and Challenges at Barasat, West Bengal, India *August 2015*
- Participated in DST INSPIRE Science Camp Learning Science at Jagadis Bose National Science Talent Search, Kolkata, India *October 2016*
- Participated in National Science (VIJYOSHI) Camp at IISER Bhopal *December 2018*
- Participated in National Science (VIJYOSHI) Camp at IISER Kolkata *December 2019*

REFERENCES

Dr. Nirmalya Ghosh

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Indian Institute of Science Education and Research Kolkata
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