

# Somnath Pandit

## Curriculum Vitae

West Bengal, Hooghly

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\* 30 May 1999

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## Education

- July 2023 – **Doctor of Philosophy**, *Indian Institute of Technology Kharagpur*, Kharagpur - 721302, India, Nanoscience and Technology.  
**Broad Area of Research:** Photonic Sensors.  
**Supervisor :** Dr. Shivakiran Bhaktha B. N., Associate Professor, Department of Physics, Indian Institute of Technology Kharagpur, Kharagpur - 721302, India.  
**Joint Supervisor :** Prof. Prasanta Kumar Guha, Professor, E& ECE Department, Indian Institute of Technology Kharagpur, Kharagpur - 721302, India.  
**Courses :** CGPA – **9.71**, Optical Fiber Tech. (EX), Quantum Devices (A), Quantum Optics (EX), Thin Film Technology (EX), Introduction to Nanoscience and Technology (EX).
- 2020 – 2022 **Master of Science (Physics)**, *Indian Institute of Technology Kharagpur*, Kharagpur, **CGPA – 8.48**  
Specialized in Optics & Photonics  
**Courses:** Electrodynamics, Optics, Quantum Mechanics, Statistical Mechanics, Condensed Matter, Nuclear and Particle, Atomic and Molecular, Fiber Optics, Nonlinear Optics, Quantum Information.
- 2017 – 2020 **Bachelor of Science (Physics Honours)**, *West Bengal State University, Ramakrishna Mission Vivekananda Centenary College*, Rahara, Kolkata - 700118, **CGPA – 8.18**  
**Courses :** EM Theory, Optics, Stat. Mech., Quantum Mech., Thermal, Solid State, Analogue and Digital, Nuclear and Particle, Communication Electronics.
- 2015 – 2017 **Higher Secondary**, *West Bengal Council of Higher Secondary Education, Goghat High School*, Hooghly, **Marks – 92.4%**  
**Subjects :** Physics, Chemistry, Mathematics, Biology, Bengali, English.
- 2015 **Secondary**, *West Bengal Board of Secondary Education, Kamarpukur Ramakrishna Mission Multi-purpose School*, Hooghly, **Marks – 92.86%**  
**Subjects :** Mathematics, Physical Science, Life Science, History, Geography, Bengali, English.

## Research Interest

Photonic sensors, Photonic crystal, Bloch Surface Wave sensing.

## Master's Thesis

- Title *Study of One Dimensional Photonic Structures and Transfer Matrix Computation.*  
Supervisor Dr. Shivakiran Bhaktha B.N., Associate Professor, Phys. Dept., IIT Kharagpur.  
Description Analyzing one-dimensional photonic crystals (PhC) with microcavity modes and Tamm modes by transfer matrix method in Python and MATLAB. Fabrication of photonic crystals with dip-coating by the sol-gel synthesis method and characterization.

## Experience

### Research

- July 2022 – **Research Assistant**, *Photonics Systems Lab, IIT Kharagpur*, India  
April 2023 Worked on picosecond laser writing, photonic crystal Tamm laser, interferometric surface profiler, waveguides. Detailed achievements:
  - Photonic crystal Tamm laser experiment in end-fire coupling setup.
  - Fabrication of waveguides using UV photolithography.
  - Interferometric setup to measure the flatness of reflecting surfaces by analyzing the fringe pattern.
  - Picosecond laser writing setup.
    - Reducing threshold with electric field confinement techniques;
    - With 20X objective lens < 1  $\mu\text{m}$  structures on silicon, patterns at different depths in transparent polymers;

June 2022 – **Summer Intern**, *Department of Physics, IIT Kharagpur, India*

July 2023 Study of waveguiding in 1D photonic crystals and Tamm states.

### Teaching

April 2020 – **FOSSEE Summer Fellow**, *FOSSEE, IIT Bombay, India*

July 2020 Mathematics with Python.

- Created lucid [notes](#) on Integrals of Multivariable Functions.
- Illustrations with animations generated with python MANIM library.
- Work is available at <https://fossee.in/fellowship/2020>.

2018 – 2022 **Local Volunteer Teacher**, *Ramakrishna Mission Vivekananda Centenary college, Rahara*

As a part of social service and skill enhancement taught students in my locality, emphasising on relating topics with their own experience.

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## Conferences & Publications

CLEO 2023 S. M. L. S, **S. Pandit**, S. Patra, D. Banerjee, and S. B. B N, "*Tamm Mode-Aided Amplified Spontaneous Emission in One-Dimensional Photonic Crystal Super-Tamm Structure*," in CLEO 2023, Technical Digest Series (Optica Publishing Group, 2023), paper FF2D.4.

NLS-31 Sarbojit Mukherjee, **Somnath Pandit**, R Hemant Kumar, Khanindra Pathak, Shivakiran Bhaktha B.N., "*Laser micromachined Moiré pattern strain sensors on polymer membrane*", NLS-31, IIT Kharagpur.

COPaQ 2022 Sudha Maria Lis S, **Somnath Pandit**, Someprosad Patra, Debamalya Banerjee, and Shivakiran Bhaktha B N, "*Spectral Narrowing of Amplified Spontaneous Emission in One- Dimensional Photonic Crystal Super Tamm Structure*", COPaQ 2022, IIT Roorkee.

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## Expertise & Skills

Experimental Photonic crystal fabrication, waveguide characterization, UV-photolithography, Laser writing, spectrometer, picosecond and nanosecond laser, spatial light modulator, dip coater, spin coater, 3D printer, high temperature furnace, plasma cleaner, ultrasonicator.

Technical proficiency PYTHON, MATLAB, GNU OCTAVE, SolidWorks, Comsol, GIT,  $\LaTeX$ , Linux, Raspberry-Pi, Windows, MS Office.

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## Awards & Achievements

2023 – Prime Minister's Research Fellow.

2023 NET qualified, Physics, Rank-201, UGC.

2023 GATE qualified, Physics, AIR-18, Score-841.

2017 – 2022 DST INSPIRE scholar.