Vivekanand Tiwari

H.H Wills Physics Laboratory
Bristol, BS8 1TL, UK
photonvivek.github.io
(+44)7384150247
vivekanand.tiwari@bristol.ac.uk
vivekiit11@gmail.com

Research Experience

- **Senior Research associate (Quantum Photonics)**, School of Electrical, Electronic and Mechanical Engineering, University of Bristol, UK, February 2025-Present.

  Topic: "Quantum Circuits: Systematically Controlling And Linking Emitters for integrated solid state photonics platforms"

- **Research associate (Quantum Photonics)**, School of Electrical, Electronic and Mechanical Engineering, University of Bristol, UK, June 2023-January 2025.

  Topic: "Quantum Circuits: Systematically Controlling And Linking Emitters for integrated solid state photonics platforms"

- **Post-doc (Nanophysics)**, Laboratoire de Physique et Chimie des Nano-objets, (LPCNO, INSA Toulouse), France, December 2021-March 2023.

  Topic: "Magnetic-semiconductor heterostructures for spin and valleytronics"

Education

- **Ph.D. (Nanophysics)**, Université Grenoble Alpes, Institut Néel (CNRS), France, November 2021.

  Doctoral Thesis: "Optical control and spin dynamics of an individual Cr in a semiconductor: Towards coherent mechanical driving with Surface Acoustic Waves"

- **M.Tech. (Applied Optics)**, Indian Institute of Technology Delhi, India, 2018.

  Dissertation Thesis: "Study of optical properties of three dimensional inorganic-organic hybrid nanoparticles"

- **MSc. (Physics)**, Banaras Hindu University, India, 2015.

  Dissertation Thesis: "Study and characterization of silicon solar cell"

- **BSc. (Physics)**, Banaras Hindu University, India, 2013.

Research Interests

- Light-matter interactions, quantum emitters, 2D materials, nanophotonics, quantum sensing, nanofabrication and low temperature physics.

Projects Experience

Research Associate / Senior Research Associate
Title: Quantum Circuits: Systematically Controlling and Linking Emitters for Integrated Solid-State Photonics Platforms

- Built a confocal-microscopy setup
- Time-resolved measurement
- Ambient and low-temperature photoluminescence (PL)
- Low-temperature photoluminescence excitation spectroscopy
- Cleanroom fabrication
- Fabrication of nanophotonic structures
- Laser lithography
- Device characterization

Post-doctoral
Title: Magnetic Semiconductor Heterostructures for Spin and Valleytronics

- Fabrication of 2D material heterostructures
- Low-temperature magneto-PL and reflectivity
- Magnetic circular dichroism measurement at 6 K
- Raman spectroscopy

Ph.D.
Title: Optical Control and Spin Dynamics of an Individual Cr in a Semiconductor: Towards Coherent Mechanical Driving with Surface Acoustic Waves

- Improved probability of finding single Cr atoms in CdTe/ZnTe quantum dots by optical characterization and MBE feedback
- Studied spin dynamics of single Cr spin inside QD using time-resolved measurements
- Involved in the development of magneto-optic setup
- Designed and fabricated SAW device using lithographic techniques
- Characterized SAW devices

Master's Project
Title: Optical Characterization of Two-Dimensional Inorganic-Organic Hybrid Material

- Synthesized inorganic-organic hybrid nanoparticles using wet chemical methods
- Optical characterization via PL measurement at room temperature
- Structural characterization via XRD and TEM

Project Student
Title: Characterization of a Crystalline Silicon Solar Cell

- Measured various parameters of crystalline silicon solar cell

Research Skills

- **Spectroscopy:** Low temperature magneto-optical spectroscopy, reflectivity, time-resolve experiments, magnetic circular dichroism.
- **Fabrication:** Mechanical exfoliation, spin coating, thermal deposition, RF sputtering, atomic layer deposition, Ar/O_2 plasma etching, lithography, glove box, Plasma Enhanced Chemical Vapor Deposition (PECVD) clean room experience.
- **Design framework:** gdshelpers, GDSFactory
- **Characterization:** Scanning electron microscopy, vectorial network analyser (VNA), SAW pulse generation, lock-in amplifier, RF electronics.
- **Software skills:** IgorPr, WinSpec, Origin, , LabView, LaTeX.
- **Python Package:** Qudi, PyCharm, Jupyter notebook
- **Machine learning Package:** scikit-learn
- **Simulation:** Lumericals, COMSOL, Matlab

Communication Skills

- English (Fluent), Hindi (Native), French (Beginner).

Soft Skills

- Open to new ideas, teamwork, creative, project management.

Teaching Experience

- **Teaching Assistant:** Department of Physics (IIT Delhi), 2016-2018.
- Prepared teaching meterials for undergraduate students
- Took tutorial classes of undergraduate students
- Guiding QE-CDT project student on Project titled as "Spin-photon interface: towards scalable hybrid quantum photonic devices" University of Bristol, June 3^{rd} 2024-August 3^{rd} 2024.

Professional Development

- **Member of conference pool:** INNOVDOC, University Grenoble Alpes, 2018-2019.
- Working with interdisciplinary team of doctoral students in a start-up
- Got opportunity to know about industry, corporate work ethics
- Organized conferences
- **Reviewer:** Optica publishing group (Optics Letters).

Management Responsibilities

- **Lab Manager of Diamond Lab (G30):** QET Lab, H.H Wills Physics laboratory, University of Bristol, August 2024-Present.
- **Lab Operations Management**: Ensure smooth day-to-day functioning of the lab, Manage lab scheduling and coordination between different research teams.
- **Equipment Management**: Oversee the maintenance, calibration, and repair of specialized quantum photonics equipment (e.g., lasers, single-photon detectors, quantum optics apparatus), Manage inventory of lab materials, tools, and consumables, placing orders as needed.
- **Health and Safety Management**: Implement and monitor compliance with health and safety standards, Conduct risk assessments for complex quantum photonics experiments

Awards & Achievements

- Marie Curie fellow with GreQue scholarship, 2018-2021.
- GATE 2016 qualified .
- Ministry of human resource development (MHRD) Scholarship from Government of India, 2016-2018.
- Board member of Eleventh Annual Bristol Quantum Information Technologies Workshop (BQIT: 2024) 22-24 April 2024, University of Bristol, UK.
- Organized and Chaired a session on "Quantum hardware development" in Eleventh Annual Bristol Quantum Information Technologies Workshop (BQIT: 2024) 22-24 April 2024, University of Bristol, UK.
- Obtained Silver LEAF award for sustainability in the lab, 2024