Sangeet Srinivasan

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Experience

2024 – 2025 **Intern**. Institute of Climate and Energy Systems: Energy Systems Engineering, Forschungszentrum Jülich.
Project: *Efficient Graph Partitioning using D-Wave Quantum Annealers*.

2023 – 2024 **Scientific Assistant (WHB)**. Quantum Information Theory Research Group, University of Cologne.
Master's Thesis: *Quantum-Inspired Neural Networks in Phase Space.*
Courses Tutored: Advanced Quantum Mechanics, Mathematics for Physics Students I (with Mathematica), Advanced Practical Course: MLab Computational Physics (with Python and Julia).

2021 – 2022 **Backend Technical Support Manager**. German Association for International Students (DEGIS) gGmbH.

2020 – 2021 **Private Home Tutor**. *Hybrid Format.* Subjects: Mathematics and Physics for HSC. Chennai, India.

2019 **Co-Founder and Representative**. Local Committee Noida, International Association of Physics Students.

2018 **Voluntary Tutor**. Physics Society, Shiv Nadar Institute of Eminence.
Courses: Introduction to Computational Physics (with Python).

Technical Skills

Coding & Scripting	**Proficient:** Python, Julia, Fortran, C++. **Familiar:** C, R, Matlab, Wolfram Language, Java.
Scientific Libraries	**Proficient:** NumPy, SciPy, SymPy, Matplotlib, LinearAlgebra.jl, Statistics.jl StatsBase.jl, JuliaPlots. **Familiar:** HSL Mathematical Software Library, DATAPLOT, Eigen.
Data Science	**Proficient:** Pandas, Seaborn, Scikit-Learn, DataFrames.jl, TensorFlow, Keras. **Familiar:** PyTorch, tiny-dnn, mlpack, Shogun.
Quantum Science	**Proficient:** QuTip, Pennylane, Strawberry Fields, Qiskit, QuantumOptics.jl, ITensors, D-Wave. **Familiar:** Yao.jl, Cirq, OpenQASM, Q#, PyZX.
Languages	**Proficient:** Markdown, SQL. **Familiar:** HTML, Bash.
Misc. Tools	Git, Cuda, Linux, Miscrosoft/Libre Office, LaTeX, Mathematica.
Computing Skills	Monte Carlo Markov Chain (MCMC) Analysis, Simulated Annealing, Stochastic Modelling, Statistical Learning, Regression Analysis, Classification, Supervised and Unsupervised Learning, Neural Network Modelling, Finite Size Scaling.
Quantum Methods	Trotterisation, Tensor Networks, Continuous Variable Quantum Computing (CVQC), Variational Quantum Circuits (VQCs), Measurement-Based Quantum Computing (MBQC), ZX Calculus, Quantum Annealing, Quantum Error Correction (QEC), Density Matrix Renormalisation Group (DMRG).

Education

2023 – 2025 **M.Sc. Physics, University of Cologne** - Matter and Light for Quantum Computing (ML4Q).
Primary Specialisation: *Foundations of Quantum Technologies: Matter, Light and Information.*

2021 – 2023 **M.Sc. Physics, University of Cologne** - Bonn-Cologne Graduate School of Physics & Astronomy (BCGS). Secondary Specialisation: *General Relativity and Quantum Field Theory.*

2016 – 2020 **B.Sc. (Research) Physics, Shiv Nadar University**.
Thesis: *A Study of Minimal Length in the context of Generalised Uncertainty Principle.*

List of Projects

Graduate Projects

2022 – 2025

- Efficient Graph Partitioning using D-Wave Quantum Annealers
- Quantum-Inspired Neural Networks in Phase Space
- Statistical Inference: Inverse Ising Problem
- Tensor Networks: Quantum Phase Transitions
- Agent Based Modelling: Non-Equilibrium Phases and Traffic Jams
- Quantum Dynamics and Circuit Emulation
- ZX Calculus and its Applications

Undergraduate Projects

2017 – 2020

- A Metaphysical Framework for the Scientific Method.
- A Study of Minimal Length in the context of Generalised Uncertainty Principle.
- Inflationary Cosmology: Motivations, Methods and Criticism.
- Motion of Astronomical Objects using `Fortran`.
- Mathematical formulation of the Quantum Zeno Effect.
- 2D and 3D Ising Model Simulation on `Python`.

Workshops, Seminars and Conferences

Bonn-Cologne Graduate School (BCGS) Conference

August 2023 — **Lead Organiser**

- Organised the annual weekend conference at the Physikzentrum Bad Honnef.
- Mediated a speed-networking event alongside the logistics of inviting speakers and students.
- Managed logistics alongside a team of students from BCGS and the German Physical Society (DPG).

Advanced Seminars

April 2023 — **Introduction to Quantum Computing**
Universal gates, measurements and computational complexity. Quantum advantage and Grover.

November 2023 — **Renormalisation Group (RG) Approach to Extreme Value Theories (EVTs)**
Introduction to RG flow methods for the Fischer-Tippet family of distributions in EVTs

May 2022 — **Semiclassical Approach to Disorder**
Survey of semiclassical methods and the scaling theory of localisation in quantum disorder.

December 2021 — **Axioms of Conformal Field Theory**
Introduction to category theory and Segal's Axioms of Conformal Field Theory.

Schools and Certifications

January 2021 — **8th Indian School of Logic - IISER Bhopal**
Participatory arts certificate from Indian Institute of Science Education and Research.

August 2020 — **Introduction to the Philosophy of Physical Sciences**
Coursera certificate issued for the course by **The University of Edinburgh**.

May 2020 — **Introduction to Philosophy**
Coursera certificate issued for the course by **The University of Edinburgh**.

Introduction to Psychology
Coursera certificate issued for the course by **Yale University**.

May 2015 — **Certificate in Advanced English**
Issued by **Cambridge University Press & Assessment English** for a **C1** English proficiency (CEFR)