D.O.B June 15, 1999
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ABHISHEK SAMLODIA

Education

BS-MS, IISER Mohali, India **August 2017 — April 2022**

- Physics Majors, Data Science and Machine Learning Minors
- CPI: 8.5/10.00

Class 12, Shishu Niketan Model Senior Secondary School, India **April 2016 — March 2017**

- Physics, Mathematics, Chemistry, English, Physical Education
- Percentage: 96.0/100.0

Class 10, Shishu Niketan Model Senior Secondary School, India **April 2014 — March 2015**

- Science, Mathematics, Social Science, English, Hindi, Punjabi
- CGPA: 10.0/10.0

Research Interest

- Computational Physics
- Lattice QCD, Numerical Simulations
- Soft Matter Physics, Biophysics
- Applied Computational Mathematics, Mathematical Modelling
- Algorithm Development, Scientific Computing
- Data Science, Machine Learning

Technical Skills

Data Science, ML	Supervised ML, Unsupervised ML, Deep Learning, Neural Networks
Programming	C, C++, Python, Julia, MATLAB, Mathematica, HTML
Scripting	Latex, Bash, GnuPlot, Linux
HPC	MPI, OpenMp, NVIDIA CUDA (C, Python)

Research Experience

MS Thesis Project **August 2021 — April 2022**

Prof. Dr. Peter Sollich, Dr. Abhishek Chaudhuri Georg August University of Goettingen, Germany – IISER Mohali, India

- Vertex Dynamics Model Simulations for Epithelial Tissues under shear strain and chiral torque
- Studying T1 topological transition in Epithelial Tissues during collective cell migration
- Studying Chiral Morphogenesis in Epithelila Tissues to understand the energetic triggers for topological transitions in the presence of line tensions in the cells
- Wrote routines for triangular lattice generation, Voronoi Tessellation, Nucleation Theory, Disk Shaft Model, Molecular Dynamics and Successive Umbrella Sampling simulation using Python, C/C++, Julia, Bash, GnuPlot, CPython

Summer Research Project **May 2021 — August 2021**

Prof. Dr. Peter Sollich Georg August University of Goettingen, Germany

- Wrote Programs for Simulated Annealing, Gradient Descent and Conjugate Gradient Descent to optimise the Energy Landscape of Confluent Tissue Monolayer under shear strain with a classical circular cavity in the centre of the tissue using Python, C/C++, Julia, Bash and GnuPlot

Monte Carlo Simulations of Bosonic BFSS, BMN and IKKT Matrix Models **September 2020 — Present**
Dr. Anosh Joseph IISER Mohali, India

- Derived functional form of mass dependence of Confined-Deconfined Phase Transition in Bosonic BMN Martix Model numerically and verified the results with Bosonic BFSS Matrix Model
- Studied Confined-Confined Transition in Bosonic BMN Matrix Model at low temperatures
- Wrote parallel routines for Metropolis Algorithm and Hybrid Monte Carlo Algorithm in the Bosonic BMN Matrix Model using MPI, C/C++, NVIDIA CUDA C, Bash and GnuPlot
- Worked with MILC based large N lattice supersymmetry code

Summer Research Project **May 2020 — August 2020**
Prof. Dr. Peter Sollich, Late Prof. Dr. Surajit Sengupta Georg August University of Goettingen, Germany – TCIS Hyderabad, India

- Vertex Model Simulations for Epithelial Tissues under shear strain
- Applied Classical Nucleation Theory to strained tissues in 2d to evaluate the metastable energy change against various nucleation radii
- Wrote routines for triangular lattice generation, Voronoi Tessellation and Nucleation Theory simulation using Python, C/C++, Julia, Bash

Summer Research Project **May 2019 — July 2019**
Dr. Arun Murhty IISER Mohali, India

- Read Philosophical Investigations by Ludwig Wittgenstein book
- Studied Classical Logic Theory
- Studied Semantics Theory
- Studied Mind Body Problem

Summer Research Project **May 2018 — July 2018**
Prof. Dr. Jasjeet Singh Bagla IISER Mohali, India

- Studied 4-Vertex Theorem for calculating cross-sections of Qunatum Field Theories
- Studied how to derive percentage abundances of light elements upto Li-7 immediately after Big Bang analytically without using Wagoner Code
- Studied Primordial Nucleosynthesis

Winter Research Project **Dec 2017 — Jan 2018**
Prof. Dr. Sanjay Mandal IISER Mohali, India

- Studied Permutation Groups and Symmetric Groups
- Studied Applications of Symmetric Groups in finding Molecular Symmetries

Publications

- Non-perturbative phase structure of the bosonic BMN matrix model, Navdeep Singh Dhindsa, Raghav G. Jha, Anosh Joseph, Abhishek Samlodia, David Schaich [arXiv:2201.08791]

Awards & Honors

August 2017 - April 2022	Department of Science and Technology Inspire Fellowship
November 2017	National Initiative for Undergraduate Sciences - Biology Camp
December 2017	National Initiative for Undergraduate Sciences - Chemistry Camp
December 2017	Vijyoshi Camp
January 2019 - Present	Student Member of Indian Science Congress Association (Reference Number : LS.STM66)
July 2019	Best Mentor in SPSTI Summer School
July 2021	First Runner Up in Pravega Innovation Summit 2021
August 2021	Xartup Fellowship 2021-2022
October 2021	Incubation at Technology Business Incubator, IISER Mohali Incubation Programme 2021-2022

Talks Given

Feb 2021 *Successive Umbrella Sampling in 2d Ising Model and 2d Triangular Harmonic Model*, Lattice Field Theory Group, IISER Mohali
Oct 2020 *Classical Nucleation Theory in 2d Triangular Lattice Systems*, Lattice Field Theory Group, IISER Mohali
Feb 2020 *Voronoi Tessellations, Theory and Applications*, Infinity - Mathematics Club, IISER Mohali
Jun 2019 *Nobel Prizes*, BBMB School Sundernagar, Himachal Pradesh, India
Jun 2019 *Pollution*, BBMB School Sundernagar, Himachal Pradesh, India

Seminars and Conferences Attended

Feb 2021 *Numerical Methods in String Theory*, ICTS Bangalore, India
Dec 2020 *Annual Logic Association meeting*, LAC, NISER Bhubnashver, India
Oct 2020 - Jan 2021 *HPC Workshop cum Course*, Indian Institute of Technology Goa, India
Jan 2019 *Indian Science Congress Association*, Lovely Professional University, Punjab, India
July 2018 *QMAT*, IISER Mohali, India
Oct 2017 *Mobile Robotics Workshop*, Indian Institute of Technology Delhi, India

Volunteer (Leadership) Experience

Statistical Physics Tutor for Help Group of PHY202 course **Jan 2020 — Feb 2020**

- **Physics Tutor,** I tutored students of BS-MS second year, fourth term / semester taking PHY202 course on Thermodynamics and Statistical Mechanics

Team Leader in a NGO, Society for Promotion of Science and Technology in India **June 2019 — July 2019**

- **Summer School for school children in rural areas,** Managed a team of 4 mentors to organise the study curriculum for the summer school and execute it

Mentor in a NGO, Society for Promotion of Science and Technology in India **June 2019 — July 2019**

- **Summer School for school children in rural areas,** Taught Physics, Mathematics, Data Science to the school children without extensively using traditional chalk-board method

Manager, Indian Institute of Science Education and Research Mohali **September 2018**

- **Mathematics Demonstrations Head,** Managed a team of 10 people for organising various Mathematics Demonstrations for the Outreach Program of IISER Mohali

Demonstration Volunteer, Indian Institute of Science Education and Research Mohali **September 2017**

- **Mathematics Demonstrations Volunteer,** Gave demonstration for role of straight lines and conservation of volume concepts for the Outreach Program of IISER Mohali

Refrees

- Dr. Anosh Joseph, IISER Mohali, India anoshjoseph@iisermohali.ac.in
- Dr. Abhishek Chaudhuri, IISER Mohali, India abhishek@iisermohali.ac.in