Gaurav Agarwal

Integrated M.Sc. (currently in 9th semester)
UM-DAE-CBS, Mumbai, India

October,1999
gaurav.agarwal@cbs.ac.in ✉
+91-6395660756 🟢 ✈

Education

- **Integrated Physics M.Sc.**   2018-2023
  Centre for Excellence in Basic Sciences (UM-DAE-CEBS)   *Mumbai, India*
  - SGPA (latest, 6th semester) : 9.24/10
  - CGPA : 8.81/10

- **High School - CBSE**   2015-2017
  Little Scholars   *Kashipur, India*
  - Scored 96.2%, (among top 5000/1.1 million appeared).

Projects

- **Superconducting tunnel junctions**   Jan, 2022 - Apr, 2022
  under Prof. Sangita Bose, CEBS and Prof. Pratap Raychaudhari, TIFR   *Mumbai, India*
  - Learnt techniques associated with low temperature measurements in dry and wet cryo systems, with and without magnetic fields, including data analysis and simulation of NbN-oxide-Ag superconducting tunnel junctions.

- **Graphene - electronic properties and defects**   Sep, 2021 - Dec, 2021
  under Prof. Vijay Singh, HBCSE/UM-DAE-CBS   *Mumbai, India*
  - Studied the tight-binding model of Graphene with next-nearest neighbor hopping and effects of substitutional defects on the band structure with the Koster-Slater Model.

- **Brownian Motion - Statistical properties and simulation**   Jun, 2021 - Aug, 2021
  under Prof. Tridib Sadhu, Tata Institute of Fundamental Research   *Mumbai, India*
  - Studied statistical properties of Random Walks & Brownian motion and their modeling with Langevin & Fokker-Planck equations supplemented with simulations. Fractional Brownian motion was also done briefly.

- **Development of a data acquisition system**   Jun, 2019 - Jul, 2019
  under Prof. R. Nagarjan, UM-DAE-CEBS   *Mumbai, India*
  - Built in-house thermocouples, paired with amplifiers and Arduino. Implemented data collection, analysis and live graphing.
    (Used in the following summer camp at home institute to instruct participants.)

- **A random walk in the undergraduate lab**   May, 2019 - Jul, 2019
  under Prof. M. Nyayate, UM-DAE-CEBS   *Mumbai, India*
  - Diffraction and interference using Lloyd's mirror & Fresnel's Bi-prism.
  - Microwave diffraction, interference and standing waves.
  - Frequency response of Piezo-electric disks and films.
  - Working and use of in-house made Lock-in Amplifiers.

- **Topology - Reading Project** — Dec 2018 - Nov, 2019
  under Prof. M.S. Raghunathan, UM-DAE-CEBS/TIFR — *Mumbai, India*
    - Overviewed group theory, basics of topology, manifolds, atlas, connectedness, metric spaces, compact spaces etc.

Other Achievements

DISHA Scholarship by Dept. of Science & Technology, Govt. of India 2018-23
All India Rank 76 in National Entrance Screening Test 2018
Attended Vijyoshi National Science Camp by Indian Institute of Sciences, Bangalore 2018
Delivered a flyover-bridge proposal to the mayor of Kashipur (construction started) 2016

Skills

- **Languages** : Speaking, reading and writing proficiency in English and Hindi.

- **Programming** : *Proficient:* Python (SciPy, Matplotlib, Numpy, Numba), Fortran 95, LaTeX
  Familiar: Tensorflow, Bash scripting.

- **Software** : *Proficient:* GNU/Linux, LabView, Mathematica, gnuplot, Google Colab, git.
  Familiar: MATLAB/Octave, Origin, GIMP & Resolve (Image/Video Editing).

- **Hardware** : *Proficient:* Soldering, Oscilloscopes, Lock-in Amplifier (SR830),
  He cryostats, Turbo Molecular Pumps, Arduino, Raspberry Pi
  Familiar: Semiconductor and scintillation detectors, Radiation detectors, diffusion pumps, sputter systems.

Certifications

- **Neural Networks and Deep Learning** by Andrew Ng — 2020
  Certificate : http:// coursera. org/ verify/ VW66ZFSGKEAK — *deeplearning.ai*

- **Improving DNN: Hyperparameters and Regularization** by Andrew Ng — 2020
  Certificate : http:// coursera. org/ verify/ WH6J33HKTSAG — *deeplearning.ai*

- **Structuring Machine Learning** by Andrew Ng — 2020
  Certificate : http:// coursera. org/ verify/ 4SEWMPSLFV96 — *deeplearning.ai*

- **Convolutional Nets and Deep Learning** by Andrew Ng — 2020
  Certificate : http:// coursera. org/ verify/ 456AC27RF993 — *deeplearning.ai*

- **Machine Learning** by Andrew Ng — 2020
  No certificate — *Stanford, Coursera*

References:

- **Prof. Sangita Bose** ✉
  UM-DAE-CBS, Mumbai   *Semester project guide, 2 theory courses & a lab course*

- **Prof. Vijay A. Singh** ✉
  Homi Bhabha Centre for Science Education, Mumbai   *Semester project guide*

- **Prof. Tridib Sadhu** ✉
  Tata Institute of Fundamental Research, Mumbai   *Summer project guide*