Yash Agarwal

yash.agarwal.phy21@itbhu.ac.in yash-agarwal1708.github.io/academic-profile Yash Agarwal

Education

Dec 2021 – Present

Indian Institute of Technology (BHU), Varanasi
B.Tech + M.Tech in Engineering Physics.
Thesis title: *Nano-materials for Water Remediation and Theranostics.*

Skills And Interests

Languages	English, Hindi, Bengali, German.
Programming	Python, MATLAB, C, C++, Java, UniProt, AMYLPRED 2, Machine Learning, Deep Learning.
Lab Methods	Self Assembly, Hydrothermal Synthesis, Membrane Casting, UV-Vis Spectroscopy, Rheology, DLS, Zeta, d33 Piezometer.
Interest Areas	Water Remediation, Biosensing, Nanotechnology, Biophysics, Computational Biology.
Relevant Coursework	Biophysics, Biophysical Techniques, Computational Physics, Advanced Condensed Matter, Intrumental Methods of Chemical Analysis, Photonics and Optoelectronics, C Programming.

Research Projects

Monte-Carlo Simulation of Transport by Motor Proteins.	**Winter Intern** **Supervisor: Prof. Ambarish Kunwar**	**1 Month** **(December 2024)**
· Learnt computational modeling of stochastic processes, like Monte Carlo simulations, Gillespie algorithm, and TASEP. · Developing a 3D stochastic model to study cargo switching at microtubule intersections using Monte-Carlo. · Contributed to build a low-cost tabletop optical tweezer with fluorescence imaging controlled using Arduino.		
Hybrid Nanocomposite Membrane for Multifunctional Water Remediation	**Master's Thesis Project** **Supervisors: Prof. Avanish Singh Parmar, Prof. Rakesh Joshi (UNSW Sydney)**	**2 Semesters- Ongoing** **(July 2024 - May 2025)**
· Protein amyloids functionalised with Chlorophyll QD sensitized g-C_3N_4 organic semiconductor for synergistic absorption and visible light photo-catalysis of dyes, PFAS, and heavy metals. · rGO + MXene 2D sheet layer for increased surface area, tunable spacing and high mechanical strength. · Review article on 'Emerging role of protein derived aerogels for environmental remediation of aqueous pollutants'.		
Bio-nanodots for Theranostic Applications.	**Research Project** **Supervisor: Prof. Avanish Singh Parmar**	**3 Semesters- Ongoing** **(Jan 2025 - May 2026)**
· Highly Cationic Lysozyme functionalized Chitosan Quantum Dots as Antibacterial Agents. · LZM-CSQD/Cellulose Acetate Membrane as Antifungal, Antimicrobial and Biodegradable food packaging. · Application of MIP coated bio-nanodots in fluorometric sensing of dopamine.		
ML Model for classification of diabetic wound images.	**Undergraduate Project** **Supervisor: Prof. Avanish Singh Parmar**	**2 Semesters** **(Jan 2024 - Nov 2024)**
· Cleaning and processing of collected Diabetic wound data in collaboration with various hospitals and doctors. · Creating an ML model to identify and classify diabetic wounds according to their severity stage. · Developing a mobile application to classify the patient's stage of diabetic wound using my ML model.		

Positions of Responsibility

Awards and Achievements

2023-24 **Joint Secretary**, IIT BHU Quiz Club.

2024 **Volunteer, organizing team**, TransMat 2K24: Translational Materials for Sustainable Technology, Department of Physics, IIT (BHU).

2023-24 **Head**, Game Development Group, Club of Programmers, IIT (BHU).

2024 **Head, Design Team**, Jigyasa'24 (Annual Fest of Physics Department, IIT BHU.

Miscellaneous Experience

Awards and Achievements

- **Poster Presentation** on 'Piezoelectric Amyloidogenic Hydrogel for Diabetic Wound Healing', International Conference on Smart Materials for Sustainable Technology (SMST 2024), INST Mohali.
- **1st Runner-Up**, Debug-It Hackathon by Club of Programmers, IIT (BHU).
- **1st position**, Space-Time Showdown Game Jam of Jigyasa'24.
- **Represented IIT BHU**, IGDC Gamedev Challenge, Inter IIT Tech Meet 2023, IIT Madras.
- **Silver Medal**, Open International Karate-Do Competition, Kolkata.
- **1st position**, Sci-Biz-Tech Quiz, Kashiyatra 2024 (Annual socio-cultural fest of IIT BHU).
- **Badge of Quantum Excellence**. Awarded by Qiskit Global Summer School 2023 by IBM.