Kaustubh R. Kumbhar, Physics Postgraduate, Curriculum Vitae (CV)

CONTACT INFORMATION

Department of Physics,
Shivaji University, (+91) 9834605414
Kolhapur (MS) India-416004

kaustubhrk.phy@gmail.com
Google Scholar, LinkedIn, GitHub
DoB- 22nd Sept 2001

RESEARCH INTERESTS

Experimental Physics, Material Science, Machine Learning Assisted Optimization and Prediction, Thin Film Fabrication and Characterization, Energy Storage Devices, Supercapacitors, etc.

EDUCATION

Shivaji University, Kolhapur (SUK) Sept 2022 – Mar 2024
M.Sc. in Physical Science, **8.63**/10 GPA
Thesis: Machine Learning Assisted Modelling of CIGS TFSCs
Advisor - Dr. N. L. Tarwal
Smart Materials Research Laboratory Aug 2023 – Present

PAHS University, Solapur Jun 2019 – Mar 2022
B.Sc. in Physical Science, 9.79/10 GPA
Projects: Automatic Street Light Control System and Clap Switch

IELTS Band 7.5 Sept 2024 – Present

EXPERIENCE

Data Science – Intern Aug 2025 - Present
Wireone Labs | Bangalore, India (Remote)
- Building and fine-tuning RAG (Retrieval Augmented Generation) model from scratch.

Physics-focused LLM Training Specialist Jun 2025 – July 2025
Turing Enterprises | California, USA (Remote)
- Trained Amazon's upcoming AI model ***Nova*** on core and applied physics, validating complex physics problems for accuracy and clarity.
- Pioneered the use of Python and computational tools to design and implement physics tasks and ensured timely and successful project delivery.

Postgraduate Research Associate Jan 2025 – Present
Monash University | Melbourne, Australia (Remote)
- Authoring a review paper on Next-Generation Supercapacitors in collaboration.

Postgraduate Research Assistant Aug 2023 – Present
Shivaji University | Kolhapur (On-Site, Remote)
- First researcher in the department to apply Machine Learning to Materials Science, building predictive models for solar cell efficiency using compositional ratios and other fabrication parameters, established data-driven research in the lab.
- Conducted research on Layered Double Hydroxide and hydroxide materials focusing on fabrication and characterization for supercapacitor application.
- Guided postgraduate students in research on material synthesis, providing mentorship in experimental methods, analysis.

PUBLICATIONS

Published

1. **K. R. Kumbhar,** et al. Predictive Modelling and Optimization of CIGS Thin Film Solar Cells: A Machine Learning Approach. (DOI)
   Solar Energy, IF: 6.0.

Under Review/Revision

1. Emerging Trends in Ozone Gas Monitoring: A Brief Overview (Book Chapter) (Minor revision submitted)
2. Emerging Functionalities and Machine Learning Integration in Next-Gen Supercapacitors
3. Investigating the effect of the electrolyte variation on the supercapacitor performance of hydrothermally synthesized MnCo-LDH films

In preparation

1. Novel Hydrothermal Synthesis of CuV Hydroxide Film for Supercapacitor Application

EXPERIMENTAL TECHNIQUES

X-ray diffraction (**XRD**) analysis, Fourier Transform Infrared Spectroscopy (**FTIR**), Field Emission Scanning Electron Microscope (**FE-SEM**), Energy Dispersive X-Ray Analysis (**EDAX**), High temperature furnace, Hydrothermal, Chemical Bath Deposition (**CBD**), Successive Ionic Layer Adsorption and Reaction, (**SILAR**), and Doctor's Blade.

TECHNICAL SKILLS

Languages: Python, MATLAB, SQL
Data Analysis: OriginPro, ImageJ, Power BI, Tableau
Developer Tools: Git, Jupyter, Google Collaboratory, VS Code
Libraries: Pandas, NumPy, Matplotlib, Seaborn, Sci-kit learn, Plotly.
Others: EndNote, NOVA 2.1, Adobe Illustrator, MS Office, X'Pert High Score Plus, ZWimp.

EXTRAS

1. Accepted candidate for **Junior Research Fellowship (JRF)** at **Institute of Chemical Technology (ICT)**, Mumbai for battery research.
2. Received research collaborations from National and Int'l universities.

REFERENCES

1. **Dr. N. L. Tarwal** (nlt.phy@unishivaji.ac.in), **Assistant Professor**, Department of Physics, Shivaji University, Kolhapur-416004, (MS), India.
2. **Prof. (Dr.) V. J. Fulari** (vc@bamu.ac.in), [**Former HOD** & **Senior Professor**, SUK, Kolhapur], **Vice Chancellor**, Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar-431004
3. **Prof (Dr.) G. B. Kolekar** (gbk_chem@unishivaji.ac), Professor, Department of Chemistry, Shivaji University, Kolhapur-416004, (MS), India