ABDUL SABOOR

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I am a graduate student working on semiconductor material modeling, electronic structure tuning in III-V semiconductors, and investigating strain effects in materials using density functional theory (DFT). My research involves extensive use of Python programming, including the development of open source data analysis packages for myself and the research community.

Education

2025(Tentative)	Ph.D. in Physics, University of Delaware
2017	M.Phil. in Physics, Quaid-i-Azam University
2015	M.Sc. in Physics, Quaid-i-Azam University
2012	B.Sc. in Mathematics & Physics, University of Azad Jammu & Kashmir

Research Experience

- Investigated band-gap engineering in III-V alloys incorporating Bi for mid-infrared applications.
- Analyzed rare-earth monopnictide nanoparticles embedded in bismide III-V alloys.
- Quantified epitaxial strain effects on III-V materials and transition-metal dichalcogenides.
- Examined metal oxidation in IrO_2 using density functional theory.

Technical & Computational Skills

- Developed ipyvasp, a Python package for the analysis of VASP calculations in Jupyter.
- Authored ipyslides, a package for building presentations using Python purely.
- Proficient in Python, PowerShell, MATLAB, and Mathematica; and expanding expertise in Julia.
- Extensive experience with computational simulations and data analysis.

Publications

- S. Nair, et al., "Engineering metal oxidation using epitaxial strain," *Nat. Nanotechnol.*, (2023)
- A. Saboor, S. Khalid, A. Janotti, "Band-gap reduction and band alignments of dilute bismide III-V alloys," *arXiv:2411.19257* [cond-mat]

Conference Participations

- The 67^{th} Electronic Materials Conference, Duke University NC 2025
- PyCon US, Pittsburgh 2025
- The Franklin Institute Awards Symposium, Temple University, 2025
- American Physical Society (APS) March Meetings, Las Vegas, 2023 and Minneapolis, 2024
- Workshop for density functional theory, Temple University, 2019

Honors & Awards

- University-funded presentation at the APS March Meeting on III-V semiconductor alloys. (2023)
- Awarded prestigious World Federation of Scientists (WFS) scholarship, Switzerland (2016)
- Offered competitive scholarship for doctoral studies at *Universidad Nacional Autónoma de México* (UNAM), Mexico (2015)

References

Prof. Anderson Janotti
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