# ABDUL SABOOR

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**Summary:** Dedicated Physics Ph.D. candidate with a passion for undergraduate education. Combines extensive teaching and mentorship experience with a strong computational research background. Proven ability to develop engaging course content and a desire to bring modern research concepts into the classroom and involve students in scholarly activities. Seeking a teaching-focused position at an institution that values high-quality instruction and student success.


## Education

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| **2025 (Expected)** | Ph.D. in Physics, University of Delaware, Newark, DE |
| **2025** | M.S. in Physics, University of Delaware, Newark, DE |
| **2017** | M.Phil. in Physics, Quaid-i-Azam University, Islamabad |
| **2015** | M.Sc. in Physics, Quaid-i-Azam University, Islamabad |
| **2012** | B.Sc. in Mathematics & Physics, University of Azad Jammu & Kashmir |

## Teaching Experience

**University of Delaware** (2018 – 2025)

Worked as a Teaching Assistant for a wide range of undergraduate physics courses over multiple semesters. Responsibilities included leading laboratory and discussion sessions, grading, holding office hours, developing online course materials, and providing one-on-one student support in the Physics Help Center. Courses and responsibilities include:

- **Introductory Physics I & II (PHYS 201, PHYS 202)** (2018-2022)
  Led multiple laboratory sections, graded assignments and lab reports.
- **Fundamentals of Physics I & II (PHYS 207, PHYS 208)** (2019-2023)
  Supervised laboratory sessions and graded lab reports for calculus-based physics for multiple majors.
- **Fundamentals of Physics with Biomedical Applications II (PHYS 204)** (2022-2024)
  Guided students with experiments tailored for biomedical applications, graded reports.
- **Physics Online Lab Development** (2020)
  Collaborated with faculty and TAs to design, create, and implement online laboratory content for undergraduate physics courses for remote learning.
- **Fundamentals of Physics Laboratory II (PHYS 228)** (2022-2025)
  Supervised discussion and laboratory sections, graded assignments, and provided one-on-one academic support to students.
- **Physics Help Center TA** (2018-2025)
  Provided drop-in academic support to undergraduate students in a wide range of introductory physics courses, assisting with problem-solving skills and conceptual understanding.

**Quaid-i-Azam University** (2017)

Worked as a Physics Teaching Assistant for one semester, assisting with teaching, grading, and laboratory supervision for undergraduate computer science students.

## Research Experience

- Led large-scale DFT simulations to model the electronic and structural properties of novel semiconductor alloys, directly supporting the design of advanced memory systems and non-Von Neumann computing hardware.
- Engineered material properties, such as band-gaps and strain effects, in III-V alloys and 2D materials, providing foundational research for next-generation electronic devices.
- Authored and co-authored research papers for high-impact peer-reviewed journals, including *Nature Nanotechnology*.
- Mentored fellow graduate students with coding for analysis in their research, fostering a collaborative and productive team environment.

## Technical Skills

- **Programming Languages:** Python, MATLAB, Mathematica, PowerShell, Julia (learning)
- **Scientific Software:** VASP, Quantum ESPRESSO, ASE, nanohub, Kwant, ATAT
- **Developer Tools:** Git, Jupyter, VS Code, Linux, Conda
- **Open Source Projects Authored:**
  - ipyvasp, a Python package for automating and analyzing VASP simulations.
  - ipyslides, a tool for creating interactive presentations within Jupyter Notebooks.
  - einteract, a library for building interactive dashboards in Jupyter notebooks.

## Publications

- S. Nair, **A. Saboor**, 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] (2024)
- **A. Saboor**, "ipyvasp: A Python Package for Interactive Analysis and Visualization of VASP Data," Zenodo, *doi:* 10.5281/zenodo.15482349 (2025)
- **A. Saboor**, "ipyslides: A Python Framework for Creating Interactive Presentations in Jupyter Notebooks," *doi:* 10.5281/zenodo.15482496 (2025)
- I. Evangelista, I. Chatratin, R. Hu, D. Q. Ho, **A. Saboor**, M. Zubair, S. Khalid, I. Fampiou, and A. Janotti. "Effects of uniaxial stress and biaxial strain on the electronic properties of monolayer transition-metal dichalcogenides." (Submission ready)
- **A. Saboor**, R. Hu, and A. Janotti. "Electronic properties of InAlAs and InGaAs alloys containing a few percent of Bi." (In progress)
- R. Hu, W. Acuna, **A. Saboor**, D. Q. Ho, J. Zide, G. W. Bryant, and A. Janotti. "Rare-earth monopnictides nanoparticles embedded in bismide III-V alloys for THz devices." (In progress)

## Conference Presentations

- The $67^{th}$ Electronic Materials Conference, Duke University NC, (2025)
  Presented: "Electronic properties of InAlAs and InGaAs alloys containing a few percent of Bi"
- The Franklin Institute Awards Symposium, Temple University, (2025)
- PyCon US, Pittsburgh, (2025)
- American Physical Society (APS) March Meeting, Minneapolis, (2024)
  Presented (by advisor): "Electronic properties of InAlAs and InGaAs alloys containing a few percent of Bi"
- American Physical Society (APS) March Meeting, Las Vegas, (2023)
  Presented: "Electronic structure and band alignment of dilute III-$V_{1-x}Bi_x$ alloys"
- SCAN Workshop, Temple University, (2019)

## References

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**John Shaw**
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