

BUSHRA ASHRAF

Contact#+14076669276 & Email: bushra.ashraf@ucf.edu

OBJECTIVE

Seeking an internship opportunity in the field of materials science and computational condensed matter theory with the aim of forecasting the properties and applications of potential materials.

EXPERIENCE

Research Assistant (January 2023 – Present) University of Central Florida

Teaching Assistant (January 2021 – December 2022) University of Central Florida

Lecturer (September 2016 – December 2020) Fatima Jinnah Women University, Pakistan

EDUCATION

Ph.D. Physics (2021 – Present) University of Central Florida

M.Phil. Physics (2012 – 2014) Quaid-e-Azam University, Pakistan

SKILLS

- Data Analysis (Python, Power BI, MS Excel, Jupyter Notebook)
- Computational Tools (Quantum Espresso, VASP, VESTA, XCRYSDEN)
- Software Expertise (MS Word, MS PowerPoint, Mathematica, MATLAB, Overleaf, LATEX)

TEACHING SKILLS

(Courses Taught)

- Quantum Mechanics
- Electricity and magnetism + Lab
- Mechanics + Lab
- Modern Physics
- Classical Mechanics
- Optics
- General Practical
- Heat & Thermodynamics

RESEARCH INTEREST

Computational Condense Matter Theory & Material Science

RESEARCH PROJECTS

Electronic properties of transition metal dichalcogenides 2021

I worked on tungsten diselenide material to study the electronic properties of transition metal dichalcogenides, making the material structure using python code and generating input for quantum espresso run and saw the band structure and density of states. Also, studied the defect in mono-layer wse2 and compare the results with experimental (STM) results to see the potential application of it as a single photon emitter.

Coverage Dependent Adsorption of NMA molecule on Pt (111) surface 2022-23

This work is related to DFT calculation of organic molecules (amines) on metal surface (Pt) related to see efficient catalytic properties.

Coadsorption of molecules on metal surface 2022-23

DFT calculation of co-adsorption of organic molecules (amines) on metal surface (Pt) for the the potential reactions on the surface.

Study of Band Structure in transition metal trichalcogenides 2023-2024

I studied transition metal trichalcogenides and saw its electronic properties and did phonon calculations to investigate about the transport properties in HfSe₃ material.

SCIENTIFIC ACTIVITIES

Conferences

- ICTP-NCP school on LHC physics (2013)
- 7th winter meeting – Poster presentation (2015)
- 14 Regional Conference on Mathematical Physics, Quaid-e-Azam University, Islamabad (2016)
- Gordon Research Seminar – **Invited speaker** (2023)
- Gordon Research Conference – Poster presentation (2023)
- APS March Meeting – Presented Talk (2024)

Workshops

- 1st refresher course for physics teachers Module-1 held in NCP, Islamabad (1-20 August, 2016)
- 1st refresher course for physics teacher Module-2 held in NCP, Islamabad (1-20 August, 2017)
- International Workshop on Optics and Photonics (2017)
- Condense Matter Physics in Quarantine (by Prof. Sandro Scandolo, 2020)

Volunteer

- Designed physics practical kits for undergrad students
- Training workshop for apparatus installation
- Problem solving tuitions to undergrad students

Professional Activities

- Conducted Board of Studies of Physics BS program at FJUW
- Organized Workshop on 'Mendeleev, A user friendly software'
- Guest Lecture and Optics Activity on collaboration with ICTP members
- Member of team who designed course catalogue of BS Physics Program

HONOURS & AWARDS

- Merit-based scholarship Award in M.Phil. (2014)
- Scientific project supervising award – Cash prize (2018)
- DCMP – Caregiver Award (2024)

PUBLICATIONS

Working on following Paper Submission:

1. Coverage Dependent Adsorption of N-Methylaniline molecule on Pt (111) surface
2. Co-adsorption of N-Methylaniline and Ethylene on Pt (111) surface
3. Spin Orbit Coupling effects on electronic band structure of HfSe₃