Ahsan Mujtaba

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Education

- **Lahore University of Management Sciences (LUMS)** — Lahore, Pakistan
  Masters of Science in Physics; Current CGPA: 3.68/4.00 — *Aug. 2019 - Oct. 2021*
  - **Thesis Title**: Semiclassical Dynamics of a Polymer Quantized Cubic Scalar Field in Cosmology
  - **Thesis Description**: I studied the inflationary expansion of our universe under the framework of semiclassical cosmology motivated by quantum gravity. The outcome of our work has multiple inflationary expansions of the universe.

- **NED University of Engineering and Technology** — Karachi, Pakistan
  Bachelors of Science in Applied Physics; Current CGPA: 3.71/4.00 *(ranked 4th)* — *Dec. 2014 - Sep. 2018*
  - **Thesis Title:**: Synthesis and Characterization of Zn^{+2} Doped Barium Hexa Ferrite
  - **Thesis Description:**: We doped Zn^{+2} to barium hexaferrite in different percentages and characterized the properties of the material through X-Ray Analysis, Fourier Transform Infrared Spectroscopy(FTIR) and Scanning Electron Microscopy(SEM) to indicate possible applications of the material.

Research and Projects Experience

- **Coefficient of Viscosity of Water**
  Research Area: Physics Lab Project/ Experimental Physics
  - **Description**: The project was part of my graduate physics course in which I redesigned a communicating vessel apparatus from commonly available supplies to measure water viscosity through video tracking software, Tracker.

- **Scattering Cross-Section of Bhabha Scattering**
  Project Areas: Quantum Field Theory(QFT), Particle Physics
  - **Description:**: This was the final project of my QFT course in which I calculated the cross-section of the Bhabha scattering with full mathematical steps. The project aimed to acquaint me with the concepts and calculations of scattering matrices, and Feynmann diagrams of particle interactions.

Teaching & Work Experience

- **Lecturer Physics** — Karachi, Pakistan
  NED University of Engineering and Technology — *Mar. 2024-present*

- **Visitng Faculty** — Karachi, Pakistan
  NED University of Engineering and Technology — *Oct. 2022-Jan. 2024*
  - **Courses Taught:**:
    * General Physics I (PH-123)—Fall 22 & Fall 23-24
    * Applied Physics (PH-122)—Fall 22
    * Quantum Mechanics I (PH-301)—Fall 23-24

- **Physics Teacher—Part Time** — Karachi, Pakistan
  Imam Hasan Askari(a.s) (IHA) Public School — *Sep. 2021-Oct. 2023*

- **Medical Physics Internee** — Karachi, Pakistan
  Karachi Institute of Radiotherapy and Nuclear Medicine (KIRAN) Hospital — *Oct. 2017*
  - **Role**: Observing and going through the process of preparation of nuclear medicines for cancer patients. Learning about radiation and X-Ray therapy procedures in the hospital with the technical staff.

Seminars, Summer Schools and Courses

- **TRISEP 2023 Theoretical Physics Summer School**
  Perimeter Institute of Theoretical Physics, Canada   *Jun. 2023*
  - **Description:**: Participant of the TRISEP school that overviewed cosmology, particle physics, and collider experiments and theories along with the current and prospective advancements.

- **Data Driven Astronomy by Coursera**
  University of Sydney   *Jun. 2023-Aug. 2023*
  - **Description:**: Learned to apply data analysis skills to real astronomical data sets e.g. exoplanets, managing the data, and machine learning algorithms to validate the data. Also worked on processing FITS data images through astropy libraries in python. Certificate

Awards, Honors, and Event Participations

- **HEC Prime Minister's Merit Laptop Award**
  NED University of Engineering and Technology   *Apr. 2017*
  - **Description**: Received laptop as a merit award through HEC for being top of the class in 2017 undergraduate.

- **Host of CLIMATECH 2023 Conference**
  NED University of Engineering and Technology   *Sep. 2023*
  - **Role**: Hosted CLIMATECH 2023 event, a collaboration of NED University(NEDUET) and University of Western Scotland(UWS). The conference focused on physics and AI-related technology impacts on our climate. It included faculty delegations from UWS and NEDUET.

Memberships

- **Member of The international society of optics and photonics (SPIE)**   *Aug. 2019-Oct. 2021*

Skills

- **Programming**: Python, Wolfram Mathematica, MATLAB, SQL.
- **Tracking Softwares**: PhysTrack(by PhysLab, LUMS), Tracker.
- **Microsoft Office**: Word, Excel, Powerpoint

- **References**

  - Dr. Tajdar Mufti (Assistant Professor Physics, LUMS)
    tajdar.mufti@lums.edu.pk
  - Dr. Roohi Zafar (Assistant Professor Physics, NEDUET)
    roohizj@neduet.edu.pk