Prem Kumar

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EDUCATION

University of Potsdam   *April 2021 – Current*
Master of Sciences in Astrophysics   *Potsdam, Germany*
Institute of Space Technology   *September 2015 – September 2021*
Bachelor of Sciences in Space Sciences   *Islamabad, Pakistan*
University of Missouri – Saint Louis   *October 2018 – December 2018*
Exchange Program   *Saint Louis, United States*

WORK EXPERIENCE

Leibniz-Institute for Astrophysics (AIP)   *October 2023 – December 2023*
Student Assistant   *Potsdam, Germany*

- Collaborated with a team of 5 developers over a 3-week coding campaign focused on *4MOST* commissioning procedures, followed by a bootcamp.
- Used Python Object-Oriented Programming (OOP) & scientific computing to execute the commissioning procedures effectively.
- Leveraged GitLab as a central repository for version control, facilitating collaboration, code reviews, and documentation management within the team.
- Implemented SCRUM framework to organize and manage the development process effectively.
- Actively participated in daily SCRUM stand-up meetings to discuss progress, challenges, and plan upcoming tasks.

RESEARCH PROJECTS

Leibniz-Institute for Astrophysics (AIP)   *January 2023 – December 2023*
Master's Thesis   *Potsdam, Germany*
Master's thesis student under **Dr. Marcel S. Pawlowski**.
Topic: "The Effect of Measurement Uncertainties the inferred Stability of Planes of Satellite Galaxies"

- Study of evolution of Plane of Satellite Galaxies (PoSG) under proper motions and distances measurement uncertainties.
- Effect of various halo masses on the evolution of PoSG.
- Utilized simulation-based approaches to analyze the impact of measurement uncertainties on the stability and evolution of PoSG.
- Used Python & Galpy library for orbital integration and data analysis.

University of Potsdam & Astronomical Institute of CAS   *August 2022 – September 2022*
Participant   *Prague, Czech Republic*

Workshop on Evolved Stars*:* Participated in a dynamic research workshop focused on evolved stars, engaging in lectures and practical exercises to acquire, reduce, and analyze spectra from a diverse selection of stars. Leveraged spectroscopic data from the Perek 2-m telescope at the Ondřejov observatory and utilized *IRAF* for data reduction and analysis.

University of Potsdam   *September 2021 – February 2022*
Lab Project   *Potsdam, Germany*
Photometry of Open Star Clusters: Engaged in a lab project using the *508 mm* OST telescope at the University of Potsdam to conduct photometry on two open star clusters. Tasked with creating color-magnitude diagrams, our aim was to determine the clusters' ages. Applied data analysis techniques to interpret the photometric data and collaborated with peers to optimize observational strategies.

Institute of Space Technology   *September 2019 – September 2020*
Bachelor's Thesis   *Islamabad, Pakistan*
Bachelor's thesis student under **Dr. Fazeel Mehmood Khan**
Topic: "Stability Analysis of Rotating and Non-Rotating Spherical Axisymmetric and Triaxial Galaxy Systems"
- Primary objective centered on examining the stability of three galaxy systems, considering their compositions with and without a Supermassive Black Hole (SMBH) at the galactic center.
- Explored spherical, triaxial, and axisymmetric models initially devoid of rotation and SMBHs, with subsequent introduction of these components
- Utilized direct N-body simulations performed on GPU-accelerated processors.

 Gaia-data-tutorial
Jupyter Notebook tutorials for downloading, processing, and analyzing Gaia data.

SKILLS

Technical Languages	Python, C++, Fortran, SQL, LaTex
Packages & Tools	NumPy, Matplotlib, SciPy, Astropy, Galpy, scikit-learn
Version Control	Git (-hub, -lab)
Operating System	Windows, Unix based OS
Astro Software	Astrometrica, TOPCAT, SAOImageDS9
Languages	English, Urdu, Sindhi

HONORS & AWARDS

Institute of Space Technology   *Islamabad, Pakistan*
Academic Excellence Award
- Received two gold medals for excelling academically.

Grantee of Cultural Exchange Program Scholarship   *Saint Louis, United States*
- Awarded the Cultural Exchange Program Scholarship, providing the opportunity to study for a semester at a U.S. university, fostering cross-cultural exchange and academic enrichment.

VOLUNTEER EXPERIENCE

IAUS379: Dynamical Masses of Local Group Galaxies   *March 20 – 24, 2023*
- Volunteered as a part of the organizing team.   *Potsdam, Germany*

Space Summer School   *July 2019*
- Delivered lectures on Astronomy at ***Institute of Space Technology***   *Islamabad, Pakistan*

World Space Week   *2015 – 2019*
- Managed and organized several events related to space science
and technology at ***Institute of Space Technology***.   *Islamabad, Pakistan*