SHUBHAN BHATIA

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EDUCATION

New York University Abu Dhabi **August 2020 - May 2024**
Bachelor of Science in Physics *Cumulative GPA: 3.86/4.00*
Founders' Day Award Recipient
Study Abroad: NYU New York (Spring 2022)

PUBLICATIONS

M. Nori, **S. Bhatia**, A.V. Macciò, FUZZY-GASOLINE*: Cosmological hydrodynamical simulations of dwarf galaxy formation with Fuzzy Dark Matter*, under review for publication in the *Monthly Notices of the Royal Astronomical Society* (arXiv: `2411.09733`).

RESEARCH EXPERIENCE

Research Assistant **October 2024 - Present**
Research Supervisor: Dr. Joseph Gelfand
Center for Astrophysics and Space Science (CASS), New York University Abu Dhabi

- Developing a UV catalog of variable sources in IC 10, a starburst galaxy in the Local Group, using photometric data from a ∼5-year weekly monitoring campaign with the Neil Gehrels Swift Observatory's UVOT detector to analyze light curves of detected u-band sources.

Undergraduate Research **September 2022 - October 2024**
Research Supervisors: Dr. Andrea Valerio Macciò and Dr. Matteo Nori
Galaxy Formation Group, Center for Astrophysics and Space Science (CASS), New York University Abu Dhabi

- **Bachelor Thesis:** *Investigating the hydrodynamical evolution of dwarf galaxies in Fuzzy Dark Matter Cosmologies.*
- Developed a suite of 30 hydrodynamical and dark matter-only zoom-in simulations of dwarf galaxies in Fuzzy Dark Matter (FDM) cosmologies using the FUZZY-GASOLINE code on NYUAD's Jubail HPC cluster.
- Analyzed the hydrodynamical evolution of dwarf galaxies, revealing minimal differences in stellar observables between FUZZY-GASOLINE and NIHAO Cold Dark Matter (CDM) systems, with notably delayed star formation in specific halo mass ranges for the former systems.

Research Assistant **May 2021 - August 2021**
Research Supervisor: Dr. Mohammad Ali-Dib
Center for Astro-Particle and Planetary Physics (CAP3), New York University Abu Dhabi

- Developed a supervised learning regression algorithm to predict the critical semi-major axis of S-type circumbinary planets
- Used results from precursory N-body simulations as the training data set for the prediction model.

RELEVANT COURSEWORK

Electricity and Magnetism, Astrophysics, General Relativity, Mechanics, Advanced Experimental Laboratory, Introduction to Detector Electronics.

TECHNICAL SKILLS

- **Programming languages**: Python, C++, C, IDL, HTML, CSS, Javascript, Java, Fortran, PHP, R, Qiskit, Arduino, Tensorflow, SQL
- **Libraries**: NumPy, SciPy, Matplotlib, Pandas, PyTorch, Astropy, heasoftpy
- **Operating systems**: Mac OS, Linux, Windows, Ubuntu
- **Software**: LaTeX, Mathematica, MATLAB, Statistica, Endnote, IRAF, ds9, Git, Stata, HEASoft, fv, Tipsy
- **Text Editors/Computing platforms**: Jupyter, Emacs, Vim, nano

COMMUNITY ENGAGEMENT

Treasurer and Outreach Coordinator - Spacebar (Astronomy Student Interest Group)

- Organized and led numerous on-campus and off-campus astronomy outreach events, including group-led tours and an external visit to the Al Sadeem Observatory.
- Secured consistent funding for the group, ensuring timely execution of planned events and completion of inventory purchases.

Podcast Co-host - Spaced Out

- Coordinated Season 3 alongside host Dr. Mohammad Abbas, overseeing guest selection, invitations, and the preparation of discussion topics. Featured guests included Dr. George Djorgovski, Dr. Mike Brown, and Dr. Terry Fong.
- Co-hosted an episode of the Spaced Out podcast (available on Apple Podcasts) with Dr. Mohammad Abbas, featuring Dr. Emily Levesque. The discussion explored stellar evolution processes and the life and future of Betelgeuse.

Web Development Team - weSTEM, NYUAD

- Revamped the weSTEM website alongside a team of 4, updating and redesigning website features such as user interface design, mobile responsiveness, content management system integration, and interactive features including event calendars and forums.

WORK EXPERIENCE

Software Development Intern - Ashanti AI **March 2021 - May 2021**
Mentored by Dr. Olufemi Olaoye

- Implemented web scraping and advanced feature engineering to streamline resume collection and preprocessing for a Machine-Learning based CV-Ranking system.
- Developed a Gradient Boosting model, improving candidate assessment efficiency by 30%.