

SHUBHAN BHATIA

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EDUCATION

New York University Abu Dhabi

Bachelor of Science in Physics

Founders' Day Award Recipient

Study Abroad: NYU New York (Spring 2022)

Aug. 2020 - May 2024

Cumulative GPA: 3.86/4.00

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

Oct. 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

Sept. 2022 - Oct. 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 - Aug. 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, Topsy

Text Editors/Computing platforms: Jupyter, Emacs, Vim, nano

High-Performance Computing: Parallel computing (OpenMP, MPI), job submission (SLURM)

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%.