

Binh Nguyen

(Nguyễn Bình, pronouns: they/them)

Email: binhnguyen@arizona.edu

Website: nguyenbinh1612.github.io | GitHub: github.com/nguyenbinh1612

EDUCATION *B.S. in Astronomy & B.A. in Linguistics* Expected May 2023
University of Arizona, Tucson, AZ

COMPUTATIONAL SKILLS

- *Python*: completed one intro course in Python, one in computational physics and one in Python applications for observational astronomy. Highly experienced in NumPy, SciPy, matplotlib and yt. Can write codes on Windows, macOS and Linux to analyze and plot data from H5, FITS, CSV and TXT files. Solved physics problems by numerical methods; interpolated samples to do discrete Fourier transforms on a variable star's light curve.
- *GIT, LaTeX, R, HTML*

RESEARCH EXPERIENCE *Summer Research Intern* Jun 2022-Aug 2022
Space Astronomy Summer Program (SASP), Space Telescope Science Institute
Project: "Unlocking the Histories of Galaxies by Simulating Stellar Halos"
Advisor: Dr. Anna Wright

- Goals: To understand how infalling dwarf galaxies contribute to the buildup of a stellar halo around Milky Way-mass galaxies, using the FOGGIE cosmological hydrodynamics simulations.
- Results: Built Python codes with Jupyter Notebook and the TANGOS framework to trace the star formation and merger histories of dwarf satellites that contribute to the stellar halo. Discovered a correspondence between the maximum mass losses of the satellites and the peaks in tidal force from their host. Presented findings at the SASP Symposium on Aug 5, 2022.

Undergraduate Research Assistant May 2021-present
Department of Astronomy, University of Arizona
Project: "Properties of Ultra-Faint Dwarfs in Cosmological Simulations"
Advisor: Dr. Gurtina Besla

- Goals: To understand the evolution of the dark matter mass profiles and kinematics of ultra-faint dwarfs across cosmic time, using high-resolution, zoom-in cosmological simulations from Jeon+21.
- Results: Built Python codes in Jupyter Notebook to compare the dark matter density profiles of the simulated dwarfs to the Navarro-Frenk-White profile and compute mass-to-light ratios using the kinematics of star particles. Corresponded with collaborators on how to improve measurements of virial radii of dark matter halos in simulations. Analysis of simulated data in comparison with observed data is ongoing.

Undergraduate Research Assistant Jun 2020-Jun 2021
Department of Astronomy, University of Arizona
Project: "Searching for Low-Mass Members of Nearby Star-Forming Regions"
Advisor: Dr. Taran Esplin

- Goals: To measure high-precision, multi-epoch astrometry from archival observations by the Spitzer Space Telescope to identify brown dwarf candidates via their proper motion in the Chamaeleon II dark cloud.

- Results: Built Python and R codes to mosaic frames from .fits files and compress tables into .csv files. Used the graph-plotting software TOPCAT to compare Spitzer’s images and those taken by the Wide-field Infrared Survey Explorer (WISE) within the same range of right ascension.

Undergraduate Independent Researcher May 2022-present
 REEES Think Tank Program, Howard University

Project: “An Analysis of Russian Consonant Clusters in Crimean Tatar”
 Mentors: Dr. Darya Kavitskaya, Dr. Laada Bilaniuk

- Goals: To investigate how the indigenous Crimean Tatar language adapted to the influx of Russian words after Crimea came under Soviet rule in the mid-20th century.
- Results: Analyzed textual corpora in English and Russian and found evidence of Crimean Tatar - a language that does not allow consonant clusters - inserting vowels into Russian consonant clusters to break them apart. Presented findings at the 2022 conference of the Association for Slavic, East European, and Eurasian Studies (ASEEES) in Chicago.

**LEADERSHIP
EXPERIENCE**

Panel Discussion Leader Aug 2021-May 2022
 Tucson Initiative for Minoritized Student Engagement in Science and Technology Program (TIMESTEP)

- Volunteered as a panel leader at TIMESTEP, a biweekly discussion group that focused on topics of professional development for UArizona undergraduate students in STEM.
- Shared advice on how to navigate through the stress of academia as a student from marginalized communities; made suggestions to program organizers about discussion ideas that could help more struggling students.

**WORK
EXPERIENCE**

Math Tutor Sep 2022-present
 Mentorship and Education in SCience for Tucson (MESCIT)

- Provides mentorship and math tutorship to students of Tohono O’odham high schools around the Tucson with the aim of developing advanced mathematical literacy and math confidence among Native American youth.

Science Journalist Mar 2021-present
 Tia Sáng Magazine, Ministry of Science and Technology of Vietnam

- Contributes as a writer specialized in astronomy to the science magazine Tia Sáng, published in Vietnamese both in print and online.
- Topics of published articles include an overview of the chemical tagging method in the hunt for solar siblings, the role of ancient East Asian astronomical records in supernova research, and how dwarfs lacking in dark matter complicate the definition of galaxy.

Telescope Operator Aug 2021-present
 Steward Observatory, University of Arizona

- Operates the 21” Raymond E. White, Jr. Telescope at Steward Observatory on campus for members of the public and for UArizona students completing class assignments for the General Education program.
- Tasks include controlling the 21” telescope with XEphem; reporting dome and telescope conditions; monitoring weather hazards; engaging in science communication with the public by introducing astronomical objects in scientific and cultural contexts.

**POSTERS,
TALKS &
LECTURES**

The Silence of the Lambda: How a Milky Way-Mass Galaxy Grows by Eating Its Neighbors
Poster, 241st AAS Meeting, Jan 2023 (forthcoming)

The Dissolution of Russian Consonant Clusters in the Crimean Tatar Language
Presentation, 54th ASEES Annual Conference, Nov 2022

Unlocking the Histories of Galaxies by Simulating Stellar Halos
Virtual Public Talk, Space Telescope Science Institute, Aug 2022

Astronomical Observations in the Historical Records of Vietnamese Dynasties
Virtual Public Talk, Tia Sáng Magazine, Mar 2022

Sex Work in The Tale of Kiều, a Medieval Vietnamese Verse Novel
Guest Lecture, University of Arizona, Nov 2021

**HONORS &
AWARDS**

Franklin E. Roach Memorial Fund (\$2,500) 2022-2023
Department of Astronomy, University of Arizona

Glenn C. Purviance Scholarship (\$2,000) 2022-2023
Department of Astronomy, University of Arizona

Galileo Circle Scholarship (\$1,000) 2022
College of Science, University of Arizona

Angelos C. Langadas Scholarship (\$1,500) 2021-2022
Department of Astronomy, University of Arizona

Young Writers Award for Literary Translation (First Prize) 2022
Vietnamese Writers' Association

International Tuition Award (\$120,000) 2019-2023
University of Arizona

**SELECTED
PUBLICATIONS**

Science Communication

- “Ồ thiên hà, màu đỏ chứng tỏ cái gì?” [What does the color red mean in galaxies?]. *Tia Sáng*. 2022.
- “Kính James Webb phô trương sức mạnh gì?” [What power has the James Webb Telescope demonstrated?]. *Tia Sáng*. 2022.
- “Vũ trụ thuở hồng hoang qua Kính thiên văn James Webb” [The primordial universe through the James Webb Telescope]. *Thanh Niên*. 2022.
- “Loạt ảnh đầu tiên từ kính thiên văn vũ trụ mạnh nhất lịch sử” [The first images from the most powerful space telescope in history]. *Nhân Dân*. 2022.
- “Tiếc thương sinh thái” [Ecological grief]. *Tia Sáng*. 2022.
- “Hướng tới một định nghĩa thiên hà mới” [Towards a new definition of galaxy]. Four-part series on *Tia Sáng*. 2021.
- “Gắn nhãn hóa học: một phương pháp truy tìm anh chị em của Mặt Trời” [Chemical tagging: a method of searching for the Sun’s siblings]. *Tia Sáng*. 2021.
- “Thiên văn học hiện đại biết được gì từ sử liệu phương Đông?” [What can modern astronomy learn from East Asian historical records?]. *Tia Sáng*. 2021.

- “Chuyện về 13 người phụ nữ bị tước cơ hội bay vào vũ trụ” [How 13 women were deprived of the chance to fly into space]. *Tia Sáng*. 2021.

Literary Translation

- *The Tale of Kiều*, translated from the Vietnamese of Nguyễn Du. Hanoi: Writers’ Association Publishing House. 2021.

Poetry

- “Spectroscopy”, read at The University of Arizona Department of Astronomy and Steward Observatory’s Graduation Ceremony, Spring 2022.
- “First Lagrangian Point.” *Euphony*, literary journal of the University of Chicago. Winter 2021.
- “The Dome’s Goodbye”, read at The University of Arizona Department of Astronomy and Steward Observatory’s Graduation Ceremony, Spring 2021.
- “Phòng tường trắng” [White-Walled Room]. *Viết & Đọc*, quarterly anthology of the Vietnamese Writers’ Association. Spring 2020.

Visual Art

- “The Wine-Dark Sea.” *The Art of Planetary Science*, exhibition of The Lunar and Planetary Laboratory. 2020.

LANGUAGES

Vietnamese: Native; *English*: Near-native; *French*: Advanced