TRUNG V. HA
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https://tvh0021.github.io/Astronomy/main_site_th.html (research website)

Curriculum Vitae

(Last updated: December 12, 2022)

RESEARCH INTERESTS

Numerical simulations of supermassive black holes in cool-core clusters.
Stellar evolution and turbulent kinematics within stellar associations.
Applications of machine learning and computer vision in astrophysics research.

EDUCATION

2020 – present	**University of North Texas, Denton, Texas** Doctor of Philosophy (PhD.) in Physics (anticipated 2025) Master of Science in Physics – conferred May 2022 GPA: 4.00 / 4.00
2017 – 2020	**University of Rochester, Rochester, New York** Bachelor of Science in Physics
2015 – 2017	**Central Arizona College, Coolidge, Arizona** Associate of Science

RESEARCH EXPERIENCE

September 2020 – Present	**Department of Physics, University of North Texas** Perform numerical simulations of supermassive black holes in cool-core clusters with the Athena++ code. (Y. Li, supervisor) Reduce and analyze near infrared spectra of quasars to confirm the correlation between weak emission lines and accretion rates. (O. Shemmer, supervisor) Analyze data from Gaia all sky survey to measure turbulence traced by young stars in various molecular clouds in the Milky Way. Model the evolution of turbulence traced by stellar populations in giant molecular cloud simulations. (Y. Li, supervisor)
September 2018 – May 2020	**Center for Computational Relativity and Gravitation, Rochester Institute of Technology** Performed dynamical simulations of binary neutron stars using the Einstein Toolkit. Documented user manual for LORENE neutron stars initial data generation code. Generated binary neutron stars initial data. (J. Faber and E. Blackman, supervisor)
June 2018 – August 2018	**Laboratory for Laser Energetics, University of Rochester** Wrote MATLAB program to analyze beamspray signals from laser shots through an under-dense plasma. Performed laser wakefield acceleration simulations in 2-D and compared results with available 3-D data.

Designed a parameter space constraint for a variable-aperture ellipsoidal plasma mirror.
(J. Shaw, supervisor)

WORK EXPERIENCE

June 2021 – Present
Graduate Research Assistant, University of North Texas
Investigate accretion onto supermassive black holes and the effects of feedback onto the surrounding environment via computer simulations.
Study the turbulent spectrum of stars, Hα gas, and CO gas in nearby molecular clouds.
Advise graduate students in the Artificial Intelligence program at UNT on an inter-disciplinary project to apply neural networks to identify similar star-forming regions of the Milky Way.

August 2020 – May 2021
Graduate Teaching Assistant, University of North Texas
Lead lab sections for introductory physics for life science majors.
Review concepts taught in lectures as pertain to the experiments, grade and provide feedback to students through exercise questions and lab reports.

September 2018 – December 2019
Undergraduate Teaching Assistant, University of Rochester
Lead physics workshop sessions for introductory-level physics course.
Assist course instructors with homework and exam grading, review materials taught in class.

September 2016 – May 2017
Mathematics tutor, Mesa Community College
Hold one-on-one tutoring sessions for students with disability at various mathematical levels, from basic arithmetic to pre-calculus.

PUBLICATIONS

"Shedding New Light on Weak Emission-Line Quasars in the CIV–Hβ Parameter Space"
Ha, Trung; Dix, C.; Matthews, B. M.; Shemmer, O.; et al., (submitted to ApJ)
"Turbulence in Milky Way Star-forming Regions Traced by Young Stars and Gas"
Ha, Trung; Li, Y.; Kounkel, M.; Xu, S.; Li, H.; Zheng, Y., (2022ApJ...934....7H)
"Handing-Off the Outcome of Binary Neutron Star Mergers for Accurate and Long-Term Post-Merger Simulations"
Lopez Armengol, F. G.; …; **Ha, Trung**; et al., (2022PhRvD.106h3015L)
"HARM3D+NUC: A new method for simulating the post-merger phase of binary neutron star mergers with GRMHD, tabulated EOS and neutrino leakage"
Murguia-Berthier, A.; …; **Ha, Trung**, et al., (2021ApJ...919...95M)
"*Measuring Turbulence with Young Stars in the Orion Complex*"
Ha, Trung; Li, Y.; Xu, S.; Kounkel M.; Li, H., (2021ApJ...907L..40H)

TALKS

January 2023
241st Meeting of the American Astronomical Society, Seattle, WA, USA
Title: "Turbulence in Milky Way Star-forming Regions Traced by Young Stars and Gas"

August 2022
Star Formation in Different Environments 2022, Rencontres du Vietnam, Quy Nhon, Vietnam
Title: "Turbulence in Milky Way Star-forming Regions Traced by Young Stars and Gas"

February 2021	**AAS Journal Author Series with Frank Timmes, YouTube** Interview on recent publication, title: "Measuring Turbulence with Young Stars in the Orion Complex" with Dr. Yuan Li.
July 2020	**TCAN on Binary Neutron Stars Workshop, Rochester Institute of Technology** Title: "Generating Initial Data for Binary Neutron Stars using LORENE" with Dr. Joshua Faber and Tanmayee Gupte.
October 2019	**Midwest Relativity Meeting, Grand Valley State University** Title: "Generating Physically Realistic Binary Neutron Stars Initial Data" with Grace Fiacco (Rochester Institute of Technology).

AWARDS AND HONORS

Spring 2019 – Spring 2020	Take Five Scholar, University of Rochester. Thesis: "Exploring the Advantages and Shortcoming of French Literature in Translation".
Spring 2018 – Spring 2020	Sigma Pi Sigma member.
Fall 2017	Dean's List, University of Rochester.
Spring 2016 – Spring 2020	Phi Theta Kappa member.
Spring 2016	Outstanding Student in Physical Science, Central Arizona College.
Fall 2015 – Spring 2017	Dean's List, Central Arizona College.

OTHER ACTIVITIES

Participated in student exchange programs: "Cultural Exchange Program" in Arizona, USA in 2014-2015 and "French in France" in Rennes, France in summer 2019.
Other interests include computer hardware, assembling desktop computers and laptops, solving various Rubik's puzzles, and traveling.
Fluent in English and Vietnamese. Intermediate level fluency in French.