TRUNG V. HA
Astronomy PhD. Candidate, University of Massachusetts Amherst

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Curriculum Vitae
(Last updated: October 8, 2024)

EDUCATION

2024 – present	**University of Massachusetts-Amherst, Amherst, Massachusetts** Doctor of Philosophy (PhD) in Astronomy *Transferred from UNT to follow PhD. advisor*
2020 – 2024	**University of North Texas, Denton, Texas** PhD candidate in Physics (transferred to UMass before receiving degree) 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

WORK EXPERIENCE

Sep 2024 – present	**Graduate Research Assistant,** University of Massachusetts Amherst
Jun 2021 – Aug 2024	**Graduate Research Assistant,** University of North Texas
Sep 2023 – May 2024	**Research Analyst and Guest Researcher,** Center for Computational Astrophysics, Flatiron Institute – Simons Foundation
Aug 2020 – May 2021	**Graduate Teaching Assistant,** University of North Texas
Sep 2018 – Dec 2019	**Undergraduate Teaching Assistant,** University of Rochester
Jun 2018 – Aug 2018	**Summer Research Intern,** Laboratory for Laser Energetics, University of Rochester
Sep 2016 – May 2017	**Mathematics tutor,** Mesa Community College

RESEARCH EXPERIENCE

Sep 2020 – Aug 2024	**Department of Physics, University of North Texas** Numerical simulations of supermassive black holes in cool-core clusters with the Athena++ code, Measure turbulence traced by young stars and gas in Milky Way star-forming regions. Advisor: Yuan Li Near-infrared spectroscopy of weak-emission line quasars. Advisor: Ohad Shemmer
Sep 2023 – May 2024	**Center for Computational Astrophysics, Flatiron Institute** Develop machine learning techniques to identify and segment current sheets in 3-dimensional plasma simulations. Advisors: Joonas Nättilä, Jordy Davelaar, and Lorenzo Sironi
Sep 2018 – May 2020	**Center for Computational Relativity and Gravitation, Rochester Institute of Technology**

Perform dynamical simulations of binary neutron stars using the Einstein Toolkit. Generate binary neutron stars initial data with LORENE.
Advisors: Joshua Faber (RIT) and Eric Blackman (U of Rochester)

Jun 2018 – Aug 2018 **Laboratory for Laser Energetics, University of Rochester**
Analysis of beamspray signals from laser shots through an under-dense plasma and laser wakefield acceleration simulation.
Advisor: Jessica Shaw

FIRST-AUTHORED PUBLICATIONS

1. ***"Bridging the Gap: Modeling Supermassive Black Holes Feeding and Feedback at the Meso-Scale"***
   Ha, Trung; Li, Y.; et al. (in prep)
2. **"*aweSOM: a CPU/GPU-accelerated Self-organizing Map and Statistically Combined Ensemble Framework for Machine-learning Clustering Analysis"***
   Ha, Trung; Nättilä, J.; Davelaar, J. (in prep; to be submitted in JOSS)
3. ***"Machine-Learning Characterization of Intermittency in Plasma Turbulence: Single vs. Double Sheet Structures"***
   Ha, Trung; Nättilä, J.; Davelaar, J.; Sironi, L. (submitted to PRL, arXiv:2410.01878)
4. ***"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., (2023ApJ...950...97H)
5. ***"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)
6. **"*Measuring Turbulence with Young Stars in the Orion Complex*"**
   Ha, Trung; Li, Y.; Xu, S.; Kounkel M.; Li, H., (2021ApJ...907L..40H)

OTHER PUBLICATIONS

1. ***"Black Hole Scaling Relations in Cosmological Simulations using Machine Learning"***
   Reinheimer, J; …; **Ha, Trung**, et al. (in prep)
2. ***"Rest-Frame Optical Spectroscopy of Ten z ~ 2 Weak Emission-Line Quasars"***
   Chen, Y.; …; **Ha, Trung**, et al. (2024ApJ...972..191C)
3. ***"Gemini Near Infrared Spectrograph - Distant Quasar Survey: Rest-Frame Ultraviolet-Optical Spectral Properties of Broad Absorption Line Quasars"***
   Ahmed, H.; …; **Ha, Trung**, et al., (2024ApJ...968...77A)
4. ***"The Nature of the Motions of Multiphase Filaments in the Centers of Galaxy Clusters"***
   Ganguly, S.; …; **Ha, Trung**, (2023FrASS..1038613)
5. ***"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)
6. ***"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)

TALKS

Apr, May, Jun 2024 **AstroAI Workshop,** Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA &
Midwest Magnetic Fields Workshop, Madison, WI, USA &

	Computational Sciences Department Seminar, Princeton Plasma Physics Laboratory (PPPL), NJ, USA & **Astrophysical Sciences Department "Thunch",** Princeton University, NJ, USA & **Astronomy & Astrophysics Seminar,** Columbia University, NY, USA Title: "Segmentation of Current Sheets in Magnetized Plasma Turbulence with Computer Vision"
Apr 2024	**Center for Computational Relativity and Gravitation Lunch Talk,** Rochester, NY, USA **(invited)** Title: "Can Neural Networks Recognize Current Sheets? Using Computer Vision to Analyze Magnetized Plasma Turbulence"
Mar 2024	**Astronomy Lunch Talk,** Department of Physics, University of California, Santa Barbara, CA, USA Title: "Tracing Turbulence with Young Stars"
Feb 2024	**Kavli Institute for Theoretical Physics (KITP) – Turbulence in the Universe Workshop,** Santa Barbara, CA, USA Title: "Segmentation of Current Sheets in Magnetized Plasma Turbulence with Computer Vision"
Jan 2024	**243rd Meeting of the AAS,** New Orleans, LA, USA Title: "Bridging the Gap: Modeling Supermassive Black Holes Feeding and Feedback at the Meso-Scale"
Dec 2023	**Black Holes on Broadway: The Next Generation of AGN Models in Galaxy Formation,** New York, NY, USA Title: "Bridging the Gap: Modeling Supermassive Black Holes Feeding and Feedback at the Meso-Scale"
Jan 2023	**241st Meeting of the AAS,** Seattle, WA, USA Title: "Turbulence in Milky Way Star-forming Regions Traced by Young Stars and Gas"
Aug 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"
Feb 2021	**AAS Journal Author Series with Frank Timmes,** YouTube Interview on recent publication, title: "Measuring Turbulence with Young Stars in the Orion Complex" with Yuan Li.
Jul 2020	**TCAN on Binary Neutron Stars Workshop,** Rochester Institute of Technology, Rochester, NY, USA Title: "Generating Initial Data for Binary Neutron Stars using LORENE" with Joshua Faber and Tanmayee Gupte.
Oct 2019	**Midwest Relativity Meeting,** Grand Valley State University, Grand Rapids, MI, USA Title: "Generating Physically Realistic Binary Neutron Stars Initial Data" with Grace Fiacco.

SUPERCOMPUTING AWARD

Mar 2024	**P.I., National Science Foundation ACCESS Explore allocation** Award: 400,000 ACCESS credits (equiv. 6000 node-hours or $1400)

AWARDS AND HONORS

Fall 2023 – Spring 2024	The Zhibing Hu Scholarship, University of North Texas, $1000.
Spring 2023	College of Science Travel Award, University of North Texas. $500.
Fall 2021 – Spring 2025	R. B. Toulouse Scholarship, University of North Texas. $1000 / year.
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 the Flatiron Institute's Center for Computational Astrophysics Pre-doctoral program in New York City in fall 2023.
Organizer for the weekly joint-UNT/UTD astronomy journal club, 2023.
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.

REFERENCES

1. Yuan Li, Ph.D. (primary advisor)
   Assistant Professor, Department of Astronomy, University of Massachusetts-Amherst
   Email address: yuanli@umass.edu

2. Joonas Nättilä, Ph.D.
   Associate Professor, Department of Physics, University of Helsinki
   Email address: joonas.nattila@helsinki.fi

3. Siyao Xu, Ph.D.
   Assistant Professor, Department of Physics, University of Florida
   Email address: xusiyao@ufl.edu

4. Lorenzo Sironi, Ph.D.
   Associate Professor, Department of Astronomy, Columbia University
   Research Scientist, Center for Computational Astrophysics – Flatiron Institute
   Email address: lsironi@astro.columbia.edu

5. Ohad Shemmer, Ph.D.
   Associate Professor, Department of Physics, University of North Texas
   Email address: ohad@unt.edu