Brandon Radzom

PhD Student · Astronomy

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Education

Indiana University (IU) - Bloomington *Bloomington, IN 47405-7000*

PhD Astronomy *Aug. 2020 - May 2025 (anticipated)*

- Minor: Scientific Computing
- Advisor: Dr. Songhu Wang
- Course highlights: Orbital Dynamics & Exoplanets, Numerical Analysis, Computational Physics

University of Wisconsin (UW) - Madison *Madison, WI 53706-1507*

B.S. Astronomy-Physics, B.S. Physics *Sept. 2016 - May 2020*

- Minor: Computer Sciences
- Distinctions: Thesis of Distinction Award, Lowell Doherty Award for Excellence in Astronomy
- Thesis title: *Characterizing AGN Activity in the SSA22 Field*
- Advisor: Dr. Amy Barger

Research Experience

Graduate Research Assistant, IU-Bloomington, Dept. of Astronomy *Bloomington, IN*

In Situ Origins of Hot Jupiter Isolation *2021-2022*

- An empirical and analytic demonstration that in situ formation can reproduce the observed isolation (among other properties) of hot Jupiters and thus account for some fraction of the population's formation history.
- Data: REBOUND (N-body)
- Advisor: Dr. Songhu Wang

Parameterization of Dynamical Stability in Hierarchical Non-EMS Planetary Systems With Application to *Kepler* Multis

- An applied computational investigation of in-situ formation of hot Jupiters (HJs). Using N-body simulations of non-EMS multi-planet systems to study analytic parameterizations of gravitational instability and comparing results to those obtained from mass-boosted *Kepler* super-Earth systems (extracted from DR25).
- Data: REBOUND (N-body), *Kepler* (NASA Exoplanet Database)
- Advisor: Dr. Songhu Wang

Undergraduate Research Assistant, UW-Madison, Dept. of Astronomy *Madison, WI*

X-ray Sources in the SSA22 Field *2019-2022*

- Utilizing optical, IR, X-ray, and newly obtained (optical) spectroscopic data along with calculated photometric redshifts to construct 2-8 keV X-ray luminosity functions (LFs) over the range $z = 0.25 - 4$ for Active Galactic Nuclei (AGN) and other extragalactic objects in the Hawaii Deep Survey Field SSA22 in order to constrain AGN activity over cosmic time and cosmic variance. Paper accepted to ApJ (Oct. 2022) includes an updated X-ray source catalog for the field.
- Data: *Chandra*/ACIS X-ray, Subaru $BVRiz$, Subaru/HSC $Ugrizy$, Keck/DEIMOS optical spectroscopy, UKIRT J & K NIR, *Spitzer* IRAC IR
- Advisor: Dr. Amy Barger

Thesis of Distinction: "Characterizing AGN Activity in the SSA22 Field"

- Combined recently obtained optical spectroscopy with 2-8 keV X-ray data to construct the LF for AGNs, Broad-line AGNs, and other extragalactic sources from $z = 0.25 - 4$. Ran a comparison with leading X-ray LF models
- Data: *Chandra*/ACIS X-ray, Keck/DEIMOS optical spectroscopy
- Advisor: Dr. Amy Barger

Undergraduate Research Assistant, UW-Madison, Dept. of Physics *Madison, WI*

Development and Implementation of a Temperature Regulation System for an Atomic Trapping Chamber *2017-2020*

- Designed, built, tested, and implemented a PID-controlled temperature regulation system for an atomic trapping chamber used for quantum computation.
- Supervisors: Dr. Mark Saffman, Dr. Matt Ebert

Minimizing Polarization Drift in a Polarization Maintaining Optical Fiber With a Dispersive Measurement

- Devised, constructed, and documented a novel device and associated methodology for polarization alignment in birefringent optical fibers. Write-up is internal to laboratory.
- Supervisors: Dr. Mark Saffman, Dr. Matt Ebert

Skills & Competencies

Programming Languages

- Python, Unix/Linux shell, HTML, Java, C++, LabView

Software

- REBOUND (collisional N-body code), GADGET-2 (collisionless N-body code), git & GitHub, LaTeX, MATLAB, Mathematica, Maple, EAZY & LePHARE (photometric redshift codes)

Awards, Fellowships, & Grants

2020	**Thesis of Distinction**, UW-Madison College of Letters & Science	
	Lowell Doherty Award for Excellence in Astronomy, Dept. of Astronomy, UW-Madison	*$500*
	Member of the Dean's List, College of Letters & Science, UW-Madison	
2019	**Member of the Dean's List**, College of Letters & Science, UW-Madison	
	Liebenberg Family Undergraduate Research Scholarship, UW-Madison	*$ 2,000*
	David H. Durra Scholarship, UW-Madison	*$ 3,000*
2018	**John Karl Scholz Sophomore General Scholarship**, UW-Madison	*$ 500*
2017	**Member of the Dean's List**, College of Letters & Science, UW-Madison	
2016	**Memorial Scholarship**, Anoka High School	*$ 500*

Publications

Refereed

Brandon T. Radzom, Anthony J. Taylor, Amy J. Barger, Lennox L. Cowie 2022. *X-ray Sources in the Chandra Field SSA22*, accepted to ApJ (October 20, 2022); arXiv:2210.10796

Non-Refereed

Brandon T. Radzom 2020. *Characterizing AGN Activity in the SSA22 Field*, Senior thesis submitted to the UW-Madison Dept. of Astronomy

Conference Posters

Brandon T. Radzom, Songhu Wang, and Bonan Pu. "In Situ Origins of Hot Jupiters", 2022, Emerging Researchers in Exoplanet Science VII, 10.5281/zenodo.6944743

Brandon T. Radzom, Amy J. Barger, and Anthony J. Taylor. "Characterizing AGN Activity in the SSA22 Field", 2020, American Astronomical Society Meeting #236, id.137.03

Minho Kwon, Christopher Young, Matthew Ebert, Sebastian Malewicz, **Brandon Radzom**, Thad Walker, and Mark Saffman. "Progress toward entanglement of atomic ensemble qubits via Rydberg blockade", 2018, International Conference on Atomic Physics

Presentations

Invited Talks

Fall 2020. *The X-ray Luminosity Function of Optically Narrow and Broad-line AGNs Out To $z \sim 4$.* IU Astronomy Friday Lunch Talk, Bloomington, IN.

Teaching Experience

Associate Instructor, IU-Bloomington, Dept. of Astronomy

Astronomy 103: Search For Life In The Universe (Fall 2021)

- Assisted in teaching an in-person 178-student course for non-majors that explores the basics of astronomy and prospects for extraterrestrial life.
- Duties: Graded assignments, held weekly hybrid office hours, attended lectures

Astronomy 222: General Astronomy II (Spring 2021)

- Assisted in teaching an online 25-student course for majors that provides a quantitative introduction to stellar astrophysics, galaxy dynamics and observational and theoretical cosmology.
- Duties: Graded assignments, held weekly online office hours, attended lectures, proctored in-person exams

Astronomy 107: The Art of Astronomy (Fall 2020)

- Assisted in teaching an online 130-student course for non-majors covering the night sky, telescopes and cameras, light and color, and the science behind astronomical images.
- Duties: Graded assignments, facilitated online discussions, held weekly online office hours

Observational Experience

2019 **WIYN/Hydra Spectrograph**, Remote observing of the North Ecliptic Pole (two nights) *Madison, WI*

Outreach & Professional Development

Service and Outreach

2021-2022 **IU Science Fest**, Astronomy demo facilitator *Bloomington, IN*
2021-2022 **Kirkwood Observatory Open Nights**, Telescope operator & tour guide *Bloomington, IN*
2022 **Streets Paved With Gold**, JWST demo facilitator *Bloomington, IN*
2022 **STEM Exploration Day**, JWST demo facilitator *Indianapolis, IN*
2022-2023 **IU Astronomy Graduate Leadership**, Undergraduate Research Coordinator
2021 **Indiana Master Naturalist Event**, Guest speaker, telescope operator *Bloomington, IN*
2019-2020 **UW-Madison Astronomy Club**, Vice President
2020 **Girl Scout Astronomy Night**, UW-Madison Astronomy Club volunteer *Madison, WI*
2018-2019 **UW-Madison Astronomy Club**, Volunteer Coordinator
2019 **Moon Over Monona Terrace**, UW-Madison Astronomy Club volunteer *Madison, WI*
2019 **My UW Days**, UW-Madison Astronomy & Physics Dept. representative *Madison, WI*
2019 **UW Space Place OAO-2 Anniversary Event**, Orbital Astronomical Observatory (OAO) guide *Madison, WI*
2018 **UW STEM Immersion Day**, UW Astronomy/ Astronomy Club representative *Madison, WI*
2017 **UW Space Place Family Science Night**, Physics and Astronomy demo leader *Madison, WI*

Development

2022: Python for Astronomers Crash Course, Planned and lead a new event that covered the basics of getting started with Python for IU's astronomy undergraduates. Topics included `anaconda` installation, logical operators, functions, loops, I/O, plotting, and integration.

2022: Special "1-minute" Colloquium, Organized the first-ever Special Colloquium session in the IU Astronomy Department which brought together researchers at all levels (undergraduate to faculty).

2021: Bring an Inclusive Mindset to Your Teaching, Participant in a 90-minute virtual workshop discussing data-driven techniques to make your classroom more inclusive to all, especially members of minoritized groups.

Professional Memberships

American Astronomical Society (2020-)