

Tatsuya Akiba

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Research Interests

My research focuses on the gravitational dynamics of bodies around compact objects. I study eccentric nuclear disks around supermassive black holes which form as a result of a gravitational recoil kick imparted on the central black hole. Using similar dynamics, I study the evolution of eccentric planetesimal disks following a white dwarf natal kick.

Education

Expected 2025	<i>Ph.D.</i> , Astrophysical and Planetary Sciences University of Colorado, Boulder Boulder, CO
2022	<i>M.S.</i> , Astrophysical and Planetary Sciences University of Colorado, Boulder Boulder, CO
2019	<i>B.S.</i> , Physics (Honors) & Mathematics (Honors), <i>Valedictorian</i> Truman State University Kirksville, MO

Honors and Awards

2023	Carl Hansen Memorial Fellowship (CU Boulder)
2022	Chance Irick Cooke Fellowship (CU Boulder)
2021	Raynor L. Duncombe Student Research Prize (DDA) Award for Excellence in Teaching (CU Boulder)
2019	Outstanding Student in Physics (Truman State) President's List (Truman State)
2018	Dr. Lanny C. Morley Scholarship (Truman State) Dr. Robert and Harlene Bailey Scholarship (Truman State)
2017	Dr. Robert Peavler Memorial Scholarship (Truman State) Dr. Wray and Helen Rieger Scholarship (Truman State) Dr. Eugene W. Smith Memorial Scholarship (Truman State) Mr. and Mrs. Robert Lisle Walker Scholarship (Truman State)

2017	TruScholars Award (Truman State)
	Kappa Mu Epsilon (Mathematics Honor Society)
	Sigma Pi Sigma (Physics Honor Society)
	L. Scott and Carol D. Ellis Scholarship (Truman State)
2016	Duane and Donna Norman Hicks Scholarship (Truman State)
2015	President's Honorary Scholarship (Truman State)
	International Baccalaureate Scholarship (Truman State)

Publications

3. **Akiba**, Dexter, et al. (2023); ApJ, 953:124
Reprocessing Models for the Optical Light Curves of Hypervariable Quasars from the Sloan Digital Sky Survey Reverberation Mapping Project
2. **Akiba** & Madigan (2021); ApJ Letters, 921:L12
On the Formation of an Eccentric Nuclear Disk following the Gravitational Recoil Kick of a Supermassive Black Hole
1. **Akiba**, Neugarten, Ortmann, & Gokhale (2019); JAAVSO, 47:2
Multi-filter Photometric Analysis of W Ursae Majoris (W UMa) Type Eclipsing Binary Stars KID 11405559 and V342 Boo

Submitted or In-Preparation:

4. **Akiba** & Madigan (2023); arXiv:2305.03054, Submitted to ApJ
Anisotropic Star Clusters around Recoiling Supermassive Black Holes
3. **Akiba**, McIntyre, & Madigan (2023); Manuscript in preparation
White Dwarf Polluters: Eccentric Disk Formation via Natal Kicks and the Tidal Disruption of Planetesimals
2. **Akiba**, Naoz, & Madigan (2023); Manuscript in preparation
Evidence of a Past Intermediate-Mass Black Hole Merger in the Galactic Center
1. Bright, **Akiba**, & Madigan (2023); Manuscript in preparation
Precessing Eccentric Stellar Disks

Invited* & Contributed Presentations

2023	MODEST-23 (Northwestern), poster *Applied Math Dynamical Systems Seminar (CU Boulder)
2022	*Smadar Naoz Research Group (UCLA) AAS DDA 53 (Flatiron Institute) *AAS HEAD 19 (Pittsburgh, PA) *Colloquium Talk (Truman State)
2021	Master's Thesis Defense (CU Boulder) AAS DDA 52 (Virtual)
2019	APS April Meeting 2019 (Denver, CO) Student Research Conference (Truman State) SPS Zone 12 Meeting (William Jewell College)
2018	Mathematics Capstone Talk (Truman State) 48th MARAC (University of Missouri, Kansas City) SPS Zone 12 Meeting (Truman State)
2017	Summer Research Symposium (Truman State)

Research Computing Allocations

2021	RMACC Summit Supercomputer 384k CPU hours
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Mentoring Experience

[Undergraduate Students](#) and [High School Students](#) I mentored at CU Boulder.

2023 – Present	<u>Tom Alexander</u> Dynamical Evolution of an ω -Clustered Disk
2021 – Present	<u>Selah McIntyre</u> Stars Engulfing Planets
2020 – 2021	<u>Allie Christensen</u> Formation of Eccentric Disks from a Black Hole Companion

Teaching Experience

2021 – 2023	Lead Graduate Student Fellow (CU Boulder)
2022	Graduate Galaxies TA (CU Boulder)
2022	Guest Lecturer for ASTR 2030: Black Holes (CU Boulder)
2020	Introductory Astronomy Graduate TA (CU Boulder)
2019	Astronomical Observations Graduate TA (CU Boulder)
2018 – 2019	STEP Scholars Program Academic Trainer (Truman State)
2017 – 2019	Upward Bound Coordinator & Academic Coach (Truman State)
2016 – 2019	Calculus Tutor (Truman State)
2016 – 2019	Physics Tutor (Truman State)
2018	Observational Astronomy Undergraduate TA (Truman State)
2018	SEE Math Tutor (Truman State)
2018	Vibrations and Waves Tutor (Truman State)
2017	Introductory Physics Grader (Truman State)
2016 – 2017	Introductory Astronomy Undergraduate TA (Truman State)
2015 – 2016	Summer School Math Instructor (KIST, Tokyo, Japan)

Community Service Experience

2023	Referee for ApJ Letters
2020 – 2023	Welcome/Social Committee (CU Boulder)
2021 – 2022	Admissions Committee (CU Boulder)
2021 – 2022	Graduate Peer Mentor (CU Boulder)
2020 – 2022	CU-Prime Mentor (CU Boulder)
2019 – 2021	Diversity, Equity, & Inclusion Committee (CU Boulder)
2019 – 2020	McNair Program Mentor (CU Boulder)
2019 – 2020	Graduate Curriculum and Concerns Committee (CU Boulder)
2019 – 2020	Observatory Committee (CU Boulder)
2019 – 2020	Observatory Open House Volunteer (CU Boulder)
2017 – 2019	President of SPS (Truman State)

2016 – 2019	Mathematical Association of America (Truman State)
2017 – 2018	President of the Stargazers Astronomy Club (Truman State)

Abbreviations

ApJ	The Astrophysical Journal
JAAVSO	The Journal of the American Association of Variable Star Observers
MODEST	Modeling and Observing Dense Stellar Systems
AAS	American Astronomical Society
DDA	Division of Dynamical Astronomy
HEAD	High Energy Astrophysics Division
APS	American Physical Society
MARAC	Mid-American Regional Astrophysics Conference
RMACC	The Rocky Mountain Advanced Computing Consortium
SPS	Society of Physics Students
STEP	STEM Talent Expansion Programs
SEE	Scholastic Enhancement Experience
KIST	K. International School Tokyo

September 24, 2023