Tatsuya Akiba

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Research Interests

I am interested in the dynamics of particles in orbit around compact objects. I work on the dynamics of eccentric disks in various astrophysical contexts including stars around supermassive black holes and planetesimals around white dwarfs.

Education

Ph.D., Astrophysical and Planetary Sciences — Expected May 2025
University of Colorado Boulder

M.S., Astrophysical and Planetary Sciences — Aug. 2022
University of Colorado Boulder

B.S., Physics, Honors & *B.S.*, Mathematics, Honors, *Valedictorian* — Aug. 2019
Truman State University

Publications

On the Formation of an Eccentric Nuclear Disk following the Gravitational Recoil Kick of a Supermassive Black Hole
Akiba & Madigan, *ApJL, 921:L12* (2021)

Multi-filter Photometric Analysis of W Ursae Majoris (W UMa) Type Eclipsing Binary Stars KID 11405559 and V342 Boo
Akiba, Neugarten, Ortmann, & Gokhale, *JAAVSO, 47:2, p.186* (2019)

Reprocessing Models for the Optical Spectra of Active Galactic Nuclei
Akiba, Dexter, et al., *Accepted for publication in ApJ*

Anisotropic Star Clusters around Recoiling Supermassive Black Holes
Akiba & Madigan, *Submitted to ApJ*

Enhanced Planetesimal Tidal Disruption Rates from an Eccentric Disk following a White Dwarf Natal Kick
Akiba & Madigan, *Manuscript in preparation*

Invited* & Contributed Presentations

*Department of Applied Mathematics, *University of Colorado Boulder* — Feb. 2023

*Smadar Naoz Research Group, *UCLA* — Jun. 2022

AAS Division of Dynamical Astronomy, *Flatiron Institute* — Apr. 2022

*AAS High Energy Astrophysics Division, *Pittsburgh, PA* — Mar. 2022

*Colloquium, *Truman State University* — Feb. 2022

Comprehensive Exam, *University of Colorado Boulder* Aug. 2021

AAS Division of Dynamical Astronomy, *Virtual* May 2021

APS April Meeting 2019, *Denver, Colorado* Apr. 2019

Student Research Conference, *Truman State University* Apr. 2019

SPS Zone 12 Meeting, *William Jewell College* Feb. 2019

Conference for Undergraduate Women in Physics, *Northwestern University* Jan. 2019

Mathematics Capstone, *Truman State University* Dec. 2018

Mid-American Regional Astrophysics Conference, *University of Missouri - KC* Apr. 2018

SPS Zone 12 Meeting, *Truman State University* Feb. 2018

Summer Research Symposium, *Truman State University* Aug. 2017

Research Experience

Formation of Eccentric Disks from Recoil Kicks Aug. 2020 – Present
Advisor: Dr. Ann-Marie Madigan

Reprocessing Models for Changing-Look Quasars May 2020 – Dec. 2022
Advisor: Dr. Jason Dexter

Asymmetries in the Light Curves of Eclipsing Binaries Jun. 2017 – Aug. 2019
Advisor: Dr. Vayujeet Gokhale

Wigner-Weyl Formalism of Quantum Mechanics Mar. 2018 – May 2019
Advisor: Dr. Taner Edis

Measure Theory and Fractals by Hausdorff Dimension Aug. 2019 – Dec. 2019
Advisor: Dr. Eric Howard

Research Mentoring Experience

Stars Engulfing Planets Nov. 2021 – Present
Advisee: Selah McIntyre

Formation of Eccentric Disks from a Black Hole Companion Oct. 2020 – Nov. 2021
Advisee: Allie Christensen

Teaching Experience

Lead Graduate Student Fellow Aug. 2021 – Present

Graduate Galaxies TA Aug. 2022 – Dec. 2022

Guest Lecturer for ASTR 2030: Black Holes Mar. 2022

Introductory Astronomy Graduate TA Jan. 2020 – May 2020

Astronomical Observations Graduate TA Aug. 2019 – Dec. 2019

Upward Bound Coordinator and Academic Coach Aug. 2017 – Aug. 2019

STEM Talent Expansion Programs Academic Trainer Jan. 2018 – May 2019

Calculus Tutor	Aug. 2016 – May 2019
SPS Physics Tutor	Aug. 2016 – May 2019
Observational Astronomy Undergraduate TA	Aug. 2018 – Dec. 2018
Scholastic Enhancement Experience Math Tutor	Jun. 2018 – Aug. 2018
Vibrations and Waves Tutor	Jan. 2018 – May 2018
Introductory Astronomy Undergraduate TA	Aug. 2016 – May 2017
IB Math HL Summer School Instructor	May 2015 – Aug. 2016

Honors and Awards

Carl Hansen Memorial Fellowship	Apr. 2023
Chance Irick Cooke Fellowship	May 2022
Raynor L. Duncombe Student Research Prize	May 2021
Award for Excellence in Teaching	Jan. 2021
Outstanding Student in Physics	May 2019
President's List	Aug. 2015 – May 2019
Dr. Lanny C. Morley Scholarship	Aug. 2018
Dr. Robert and Harlene Bailey Scholarship	Aug. 2018
Dr. Robert Peavler Memorial Scholarship	Aug. 2017
Dr. Wray and Helen Rieger Scholarship	Aug. 2017
Dr. Eugene W. Smith Memorial Scholarship	Aug. 2017
Mr. and Mrs. Robert Lisle Walker Scholarship	Aug. 2017
Kappa Mu Epsilon, *Mathematics Honor Society*	Inducted Apr. 2017
Sigma Pi Sigma, *Physics Honor Society*	Inducted Mar. 2017
L. Scott and Carol D. Ellis Scholarship	Jan. 2017
Duane Norman and Donna Norman Hicks Scholarship	Aug. 2016
President's Honorary Scholarship	Aug. 2015
International Baccalaureate Scholarship	Aug. 2015

Service and Outreach Experience

Member of the Welcome/Social Committee	Aug. 2020 – Present
Member of the Admissions Committee	Aug. 2021 – May 2022
Mentor for the Graduate Peer Mentoring Program	Aug. 2021 – May 2022
Mentor for CU-Prime	Aug. 2020 – May 2022
Member of the Recruitment and Retention Committee	Aug. 2019 – May 2021
Mentor for the McNair Program	Aug. 2019 – May 2020
Member of the Graduate Curriculum and Concerns Committee	Aug. 2019 – May 2020
Member of the Observatory Committee	Aug. 2019 – May 2020
Volunteer for the Observatory Open Houses	Aug. 2019 – Mar. 2020
President of the Society of Physics Students	Aug. 2017 – May 2019
Member of the Mathematical Association of America	Aug. 2016 – May 2019
President of the Stargazers Astronomy Club	Aug. 2017 – May 2018
Secretary of Women in Physics	Jan. 2017 – May 2017