

Tatsuya Akiba

Dept. of Astrophysical and Planetary Sciences & JILA
University of Colorado, Boulder
Boulder, CO 80309

tatsuya.akiba@colorado.edu
astroakiba.com

Research Interests

I am interested in the gravitational dynamics of bodies in orbit around compact objects. I study the evolution of eccentric nuclear disks after a supermassive black hole receives a gravitational recoil kick. Using similar dynamics, I study the evolution of lopsided planetesimal disks following a white dwarf natal kick.

Education

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

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)

Reprocessing Models for the Optical Light Curves of Hypervariable Quasars from the Sloan Digital Sky Survey Reverberation Mapping Project

Akiba, Dexter, et al., *ApJ*, 953:124 (2023)

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 (2019)

Anisotropic Star Clusters around Recoiling Supermassive Black Holes

Akiba & Madigan, *Submitted to ApJ*, arXiv:2305.03054

Tidal Disruption of Planetesimals in an Eccentric Disk following a White Dwarf Natal Kick

Akiba, McIntyre, & Madigan, *Manuscript in preparation*

Evidence of a Past Intermediate-Mass Black Hole Merger in the Galactic Center

Akiba, Naoz, & Madigan, *Manuscript in preparation*

Precessing Eccentric Stellar Disks

Bright, **Akiba**, & Madigan, *Manuscript in preparation*

Invited* & Contributed Presentations

MODEST-23, <i>Northwestern University</i> (poster)	Aug. 2023
*Department of Applied Mathematics, <i>University of Colorado Boulder</i>	Feb. 2023
*Smadar Naoz Research Group, <i>UCLA</i>	Jun. 2022
AAS Division of Dynamical Astronomy, <i>Flatiron Institute</i>	Apr. 2022
*AAS High Energy Astrophysics Division, <i>Pittsburgh, PA</i>	Mar. 2022
*Colloquium, <i>Truman State University</i>	Feb. 2022
Comprehensive Exam, <i>University of Colorado Boulder</i>	Aug. 2021
AAS Division of Dynamical Astronomy, <i>Virtual</i>	May 2021
APS April Meeting 2019, <i>Denver, Colorado</i>	Apr. 2019
Student Research Conference, <i>Truman State University</i>	Apr. 2019
SPS Zone 12 Meeting, <i>William Jewell College</i>	Feb. 2019
Conference for Undergraduate Women in Physics, <i>Northwestern University</i>	Jan. 2019
Mathematics Capstone, <i>Truman State University</i>	Dec. 2018
Mid-American Regional Astrophysics Conference, <i>University of Missouri - KC</i>	Apr. 2018
SPS Zone 12 Meeting, <i>Truman State University</i>	Feb. 2018
Summer Research Symposium, <i>Truman State University</i>	Aug. 2017

Research Experience

<i>Formation of Eccentric Nuclear Disks from Recoil Kicks</i> Advisor: Dr. Ann-Marie Madigan	Aug. 2020 – Present
<i>Tidal Disruption of Planetesimals from a White Dwarf Kick</i> Advisor: Dr. Ann-Marie Madigan	Mar. 2020 – Present
<i>Intermediate-Mass Black Hole Merger in the Galactic Center</i> Advisor: Dr. Smadar Naoz	Mar. 2023 – Present
<i>Reprocessing Models for Changing-Look Quasars</i> Advisor: Dr. Jason Dexter	May 2020 – Dec. 2022
<i>Asymmetries in the Light Curves of Eclipsing Binaries</i> Advisor: Dr. Vayujeet Gokhale	Jun. 2017 – Aug. 2019
<i>Wigner-Weyl Formalism of Quantum Mechanics</i> Advisor: Dr. Taner Edis	Mar. 2018 – May 2019
<i>Measure Theory and Fractals by Hausdorff Dimension</i> Advisor: Dr. Eric Howard	Aug. 2019 – Dec. 2019

Mentoring Experience

<i>Stars Engulfing Planets</i> Advisee: Selah McIntyre	Nov. 2021 – Present
<i>Formation of Eccentric Disks from a Black Hole Companion</i> Advisee: Allie Christensen	Oct. 2020 – Nov. 2021

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, <i>Mathematics Honor Society</i>	Inducted Apr. 2017
Sigma Pi Sigma, <i>Physics Honor Society</i>	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