\mathbf{SELF}

My research concerns the dynamics of binary stars in galactic centers; I use a mix of analytical and numerical tools to clarify our understanding of these complicated systems. My general interests span all scales of astrophysical dynamics. Beyond research, I center outreach and education in my day-to-day work.

 $2022 - (\exp. 2027)$

2018 - 2022

EDUCATION

University of Toronto, Toronto, ONPh.D. candidate, Department of Astronomy & AstrophysicsGraduate researcher, Canadian Institute for Theoretical Astrophysics (CITA)Advisors: Professors Yanqin Wu & Scott Tremaine

Princeton University, Princeton, NJ

A.B. Astrophysical Sciences, magna cum laude Certificate in Planets and Life Thesis advisors: Dr. Christopher Spalding & Professor Jeremy Goodman

PUBLICATIONS

- M. Dodici & S. Tremaine, 2024. Studying binary formation under dynamical friction using Hill's Problem. ApJ, 972, 193.
- B. Lewis et al. (incl. M. Dodici), 2024 (submitted). Improving Undergraduate Astronomy Students' Skills with Research Literature via Accessible Summaries: A Case Study with Astrobites-based Lesson Plans. arXiv eprints astro-ph:2309.05822.
- M. Dodici & Y. Wu, in prep. Breaking up a denser, primordial Neptunian scatter belt to supply material for the cold, classical Kuiper Belt.
- B. Hensley, C. Murray, M. Dodici, 2022. Polycyclic Aromatic Hydrocarbons, Anomalous Microwave Emission, and their Connection to the Cold Neutral Medium. ApJ, 929, 23.

TALKS

Binary formation in galactic nuclei under dynamical friction	
American Astronomical Society (AAS) Division on Dynamical Astronomy 55. Toronto, ON.	May 2024
CITA Compact Objects Group. Toronto, ON.	Feb 2024
Department Lunch Seminar (U. Toronto). Toronto, ON.	Jan 2024
Breaking up the early Neptunian scatter belt to source material for the cold classical Kuiper belt	5.
AAS Division for Planetary Science 55. San Antonio, TX.	Oct 2023
CITA Planet Day. Toronto, ON.	Aug 2023
Finding a distribution of stellar obliquities for newly-formed planets in binary systems. Emerging Researchers in Exoplanet Science Symposium VIII. New Haven, CT. Great Lakes Exoplanets Area Meeting. Columbus, OH.	Jun 2023 Nov 2022
A Trojan Horse for White Dwarfs: Co-orbital asteroid dynamics under stellar mass loss, radiative	e effects.
AAS 240. Pasadena, CA.	Jun 2022

LEADERSHIP ROLES

Coding the Cosmos (HS workshop series), Co-organizer & Speaker	Sep 2023 –
U. Toronto Graduate Astronomy Students Assoc., Courses & Qualifying Exams Commit	tee Oct 2022 –
AstroTours (Public lecture/telescope nights), Co-director (since Oct. 2023)	Oct 2022 –
Age of the Universe (HS workshop), Co-organizer & Speaker M	ar 2023 – Jul 2023

OTHER OUTREACH

Astrobites (Research blog), Author & Education Study co-author	Jan $2023 -$
Eclipse 2024 at the Toronto Public Library (Public lecture series), Speaker	Mar 2024 - Apr 2024
Solar Eclipse 2024: Indigenous Knowledge (Video), Editor	Mar 2024
Cosmos from your Couch (Astronomy video series), Editor	Feb $2023 - Dec 2023$

ComSciCon Canada (Science Communication Workshop), Attendee Princeton Research Day (PRD; Virtual talk competition), Award-winning presenter	Jul 2023 May 2021	
 FELLOWSHIPS, GRANTS, and AWARDS Dunlap Institute Seed Funding Grant, for Coding the Cosmos — \$30,000 for Age of the Universe — \$6,000 CITA Graduate Scholarship — \$5,000 C.a. Chant Fellowship in Astronomy — \$11,000 David A. Dunlap Entrance Award — \$10,000 PRD Undergraduate Presenter Award — \$500 	2024 2023 2023 2022, 2023 2022 2021	
RESEARCH POSITIONS		
Supervisors listed in italics. Graduate Researcher — CITA, Prof. Scott Tremaine Graduate Researcher — U. Toronto, Prof. Yanqin Wu Undergrad. Thesis — Princeton Univ., Dr. Chris Spalding, Prof. Jeremy Goodman Research Assistant — Princeton Univ., Dr. Christopher Spalding Research Assistant — Princeton Univ., Prof. Neta Bahcall Research Assistant — Princeton Univ., Dr. Brandon Hensley	Apr 2023 – Oct 2022 – Sep 2021 – May 2022 Aug 2020 – Aug 2021 Jan 2021 – May 2021 Jun 2020 – Sep 2020	
TEACHING EXPERIENCE Tonics in bold at end of descriptions. All positions are teaching assistantships		
Stars and Galaxies (AST201) — U. Toronto Led tutorials, wrote questions, graded exams; stellar evolution, galaxies, co	Winter 2023, 2024 smology .	
The Sun and its Neighbours (AST101) — U. Toronto Led tutorials, aided observations, conducted oral exams; planets , stars , and t	Fall 2022, 2023 their formation.	
The Universe (AST203) — Princeton Univ. Led work sessions and office hours, graded assignments; astronomy survey c	Winter 2021, 2022 ourse .	
STUDENT FEEDBACK		
From course reviews for AST101 (F22) and AST201 (W23) at U. Toronto. Emphasis added.		
"Mark was equally great at explaining concepts and encouraging class discussion" (101)		

"Very encouraging and good at expanding on students thoughts." (201)

"In one instance, a student asked a **complicated question that he didn't know** off the top of his head and [Mark] **came to us the next week with the solution** instead of forgetting about it." (201)

"Mark did really well **explaining certain concepts** that were challenging." (101)

"The tutorial sessions were very streamlined and conducive to furthering our understanding of the lecture material." (101)