Mark Dodici

Toronto, ON :: +1 607-280-5835 :: mdodici.github.io :: mark.dodici@astro.utoronto.ca

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.

EDUCATION

University of Toronto, Toronto, ON — 2022 – (exp. 2027)
Ph.D. candidate, Department of Astronomy & Astrophysics
Graduate researcher, Canadian Institute for Theoretical Astrophysics (CITA)
Advisors: Professors Yanqin Wu & Scott Tremaine

Princeton University, Princeton, NJ — 2018 – 2022
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 (In press @ ApJ). Studying binary formation under dynamical friction using Hill's Problem. arXiv eprints astro-ph:2404.08138.

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.
- 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. — Jun 2023
- Great Lakes Exoplanets Area Meeting. Columbus, OH. — Nov 2022

A Trojan Horse for White Dwarfs: Co-orbital asteroid dynamics under stellar mass loss, radiative 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 Committee* — Oct 2022 –
AstroTours (Public lecture/telescope nights), *Co-director (since Oct. 2023)* — Oct 2022 –
Age of the Universe (HS workshop), *Co-organizer & Speaker* — Mar 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* Jul 2023
Princeton Research Day (PRD; Virtual talk competition), *Award-winning presenter* May 2021

FELLOWSHIPS, GRANTS, and AWARDS

Dunlap Institute Seed Funding Grant, *for Coding the Cosmos* — $30,000 2024
for Age of the Universe — $6,000 2023
CITA Graduate Scholarship — $5,000 2023
C.a. Chant Fellowship in Astronomy — $11,000 2022, 2023
David A. Dunlap Entrance Award — $10,000 2022
PRD Undergraduate Presenter Award — $500 2021

RESEARCH POSITIONS

Supervisors listed in italics.

Graduate Researcher — CITA, *Prof. Scott Tremaine* Apr 2023 –
Graduate Researcher — U. Toronto, *Prof. Yanqin Wu* Oct 2022 –
Undergrad. Thesis — Princeton Univ., *Dr. Chris Spalding, Prof. Jeremy Goodman* Sep 2021 – May 2022
Research Assistant — Princeton Univ., *Dr. Christopher Spalding* Aug 2020 – Aug 2021
Research Assistant — Princeton Univ., *Prof. Neta Bahcall* Jan 2021 – May 2021
Research Assistant — Princeton Univ., *Dr. Brandon Hensley* Jun 2020 – Sep 2020

TEACHING EXPERIENCE

*Topics in **bold** at end of descriptions. All positions are teaching assistantships.*

Stars and Galaxies (AST201) — U. Toronto Winter 2023, 2024
Led tutorials, wrote questions, graded exams; **stellar evolution**, **galaxies**, **cosmology**.

The Sun and its Neighbours (AST101) — U. Toronto Fall 2022, 2023
Led tutorials, aided observations, conducted oral exams; **planets**, **stars**, **and their formation**.

The Universe (AST203) — Princeton Univ. Winter 2021, 2022
Led work sessions and office hours, graded assignments; **astronomy survey course**.

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)