

# Michael Hammer

<https://lavinia.as.arizona.edu/~mhammer/>

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## RESEARCH INTERESTS

Formation and Evolution of Planets, Protoplanetary Disks, and Planetary Systems

- Numerical simulations (Hydro-dynamics and N-body dynamics)
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## EDUCATION

**University of Arizona, Tucson, AZ**

August 2015 – Present

Ph.D. Candidate in Astronomy and Astrophysics

Advisor: Professor Kaitlin Kratter

**Cornell University, College of Arts and Sciences, Ithaca, NY**

May 2015

B.A. in Physics with an Astrophysics Concentration

[Minor in Computer Science]

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## AWARDS

(1) NSF Graduate Research Fellowship

August 2015 – August 2018

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## GRADUATE RESEARCH EXPERIENCE

**Graduate Researcher**

August 2015 – Present

Star and Planet Formation Theory Group, *University of Arizona*

*Tucson, AZ*

Advisors: Professor Kaitlin Kratter, Dr. Paola Pinilla, and Dr. Min-Kai Lin

- Determined vortices are weaker when triggered by realistically-grown planets
  - Determined these vortices have elongated appearances in dust observations
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## UNDERGRADUATE RESEARCH EXPERIENCE (selected)

**Undergraduate Researcher**

January 2014 – June 2015

Theoretical Astrophysics Group, *Cornell University*

*Ithaca, NY*

Advisors: Dr. Diego Muñoz and Professor Dong Lai

- Utilized the Mercury package to analyze the stability of circumbinary planets
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**LEAPS Intern** (LEAPS Program at Leiden)

June 2014 – August 2014

Computational Astrophysics Group, *Sterrewacht Leiden*

*Leiden, The Netherlands*

Advisors: Dr. Lucie Jílková and Professor Simon Portegies Zwart

- Determined which stellar flyby orbits transfer objects between debris disks
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## WORKSHOPS

(1) NExSS Winter School: *Planetary Habitability (Tucson, AZ)*

February 2016

(2) NExSci Sagan Workshop: *Exoplanet Demographics (Pasadena, CA)*

July 2015

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## PUBLICATIONS (2 first-author, 7 total)

- [1] Su, K., Jackson, A., Gáspár, A., Rieke, G. et al. including **Hammer, M.**, 2019, *Extreme Debris Disk Variability: Exploring the Diverse Outcomes of Large Asteroid Impacts During the Era of Terrestrial Planet Formation*, AJ, 157, 202
  - [2] **Hammer, M.**, Pinilla, P., Kratter, K., Lin, M.-K., 2019, *Observational diagnostics of ... planet-induced vortices with realistic planet formation time-scales*, MNRAS, 482, 3609
  - [3] Kozarev, K., Davey, A., Kendrick, A., **Hammer, M.**, Keith, C., 2017, *The Coronal Analysis of SHocks and Waves (CASHew) framework*, JSWSC, 7A, 32
  - [4] **Hammer, M.**, Kratter, K., Lin, M.-K., 2017, *Slowly-growing gap-opening planets trigger weaker vortices*, MNRAS, 466, 3533
  - [5] Jílková, L., Hamers, A., **Hammer, M.**, & Portegies Zwart, S., 2016, *Mass transfer between debris discs during close stellar encounters*, MNRAS, 457, 4218
  - [6] Jílková, L., Portegies Zwart, S., Pijloo, T., & **Hammer, M.** 2015, *How Sedna and family were captured in a close encounter with a solar sibling*, MNRAS, 453, 3157
  - [7] Kozarev, K. A., Raymond, J. C., Lobzin, V. V., **Hammer, M.** 2014, *Properties of a Coronal Shock Wave as a Driver of Early SEP Acceleration*, ApJ, 799, 167
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## TALKS (selected)

*Planet-induced vortices: The effects of realistic planet formation timescales (Version 2)*

- (1) From protoplanetary discs to planetary systems (*Ringberg Castle, Germany*) September 2019
- (2) Star and Planet Formation in the Southwest 2 (*Oracle, AZ*) March 2018

*Planet-induced vortices: The effects of realistic planet formation timescales (Version 1)*

- (1) Protoplanetary Disk Meeting (*Los Alamos, NM*) August 2017
- (2) Emerging Researchers in Exoplanets Symposium (*Ithaca, NY*) June 2016

*Transferring Disks during Stellar Flybys*

- (1) LEAPS Symposium (*Leiden, The Netherlands*) August 2014
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## OUTREACH (selected)

- (A) **Instructor**, UA Sky School August 2019 – Present  
*Facilitating elementary school student teams in conducting three-day research projects*
- (B) **Teacher-in-training**, ISEE Professional Development Program March 2019 – June 2019  
*Taguht full-day inquiry activity to undergraduate participants in AstroCom NYC*
- (C) **Author**, Astrobites December 2015 – December 2018  
*(i) <https://astrobites.org/author/mhammer/>, (ii) Advertising chair, (iii) Social media czar*
- (D) **Outreach Coordinator**, Cornell Society of Physics Students Jan. 2012 – Jan. 2015  
*(i) Organized outreach events, (ii) Recruited students for events, (iii) Managed Website*
- (E) **President**, Cornell Astronomical Society June 2013 – June 2014  
*(i) Ran weekly stargazing nights, (ii) Gave public lectures, (iii) Set up Astro. Dept. events*