

# Michael Hammer

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

---

## RESEARCH INTERESTS

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

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

## 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]

---

## AWARDS

(1) NSF Graduate Research Fellowship

August 2015 – June 2018

---

## 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
- 

## 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
- 

**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
- 

## WORKSHOPS

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

February 2016

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

July 2015

---

---

## PUBLICATIONS (2 first-author, 6 total)

- [1] **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
  - [2] Kozarev, K., Davey, A., Kendrick, A., **Hammer, M.**, Keith, C., 2017, *The Coronal Analysis of SHocks and Waves (CASHew) framework*, JSWSC, 7A, 32
  - [3] **Hammer, M.**, Kratter, K., Lin, M.-K., 2017, *Slowly-growing gap-opening planets trigger weaker vortices*, MNRAS, 466, 3533
  - [4] Jílková, L., Hamers, A., **Hammer, M.**, & Portegies Zwart, S., 2016, *Mass transfer between debris discs during close stellar encounters*, MNRAS, 457, 4218
  - [5] 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
  - [6] 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
- 

## TALKS (selected)

### *Planet-induced vortices: The effects of realistic planet formation timescales*

- (1) Star and Planet Formation in the Southwest 2 (*Oracle, AZ*) March 2018
- (2) Protoplanetary Disk Meeting (*Los Alamos, NM*) August 2017
- (3) Steward Observatory Internal Symposium (*Tucson, AZ*) September 2016
- (4) Emerging Researchers in Exoplanets Symposium (*Ithaca, NY*) June 2016

### *Transferring Disks during Stellar Flybys*

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

## POSTERS (selected)

- [1] **Hammer, M.**, Jílková, L., Portegies Zwart, S. 2015, *Transferring Mass between Circumstellar Disks during Stellar Flybys*, AAS 225, #349.02
- 

## OUTREACH (selected)

- (A) **Teacher-in-training**, ISEE Professional Development Program March 2019 – June 2019  
*Teaching two-day instructional activity to undergraduate participants in AstroCom NYC*
- (B) **Author**, Astrobites December 2015 – December 2018  
*(i) <https://astrobites.org/author/mhammer/>, (ii) Advertising chair, (iii) Social media czar*
- (C) **Teaching Astronomer**, Project ASTRO September 2017 – May 2018  
*Taught several classes of 7<sup>th</sup> grade students astronomy-themed lessons*
- (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*