

# Michael Hammer

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## RESEARCH STATEMENT

I use supercomputers to conduct hydrodynamic simulations of planets in protoplanetary discs. My goal is to combine the output of these simulations with radiative transfer models in order to interpret disc observations and better understand planet formation.

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## EDUCATION

**University of Arizona**, Tucson, AZ

Expected: August 2021

Ph.D. Candidate in Astronomy and Astrophysics

Advisor: Professor Kaitlin Kratter

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

**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

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| (1) | NASA Space Grant Fellowship (\$16K / yr for 1 yr)       | August 2020 – August 2021 |
| (2) | NSF Graduate Research Fellowship (\$34K / yr for 3 yrs) | August 2015 – August 2020 |
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## PUBLICATIONS (3 first-author, 8 total)

ADS Library: <https://ui.adsabs.harvard.edu/user/libraries/7BISuDPxSZWNFyyco6ZgmA>

- [1] **Hammer, M.**, Lin, M.-K., Kratter, K., Pinilla, P., *Which planets trigger longer-lived vortices: low-mass or high-mass?*, MNRAS, accepted
- [2] 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
- [3] **Hammer, M.**, Pinilla, P., Kratter, K., Lin, M.-K., 2019, *Observational diagnostics of elongated planet-induced vortices with realistic planet formation time-scales*, MNRAS, 482, 3609
- [4] Kozarev, K., Davey, A., Kendrick, A., **Hammer, M.**, Keith, C., 2017, *The Coronal Analysis of SHocks and Waves (CASHew) framework*, JSWSC, 7A, 32
- [5] **Hammer, M.**, Kratter, K., Lin, M.-K., 2017, *Slowly-growing gap-opening planets trigger weaker vortices*, MNRAS, 466, 3533
- [6] Jílková, L., Hamers, A., **Hammer, M.**, Portegies Zwart, S., 2016, *Mass transfer between debris discs during close stellar encounters*, MNRAS, 457, 4218

- [7] 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
  - [8] 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; conference talks in bold)

*Planet-induced vortices: The effects of realistic planet formation timescales (Version 3)*

- (1) **AAS Meeting 237**, #213.05 (Phoenix, AZ – online) January 2021
- (2) **Five Years After HL Tau** (Santiago, Chile – online) December 2020
- (3) CCA Planet Formation Group Meeting (New York City, NY – online) October 2020
- (4) QMUL Planet Formation Group Meeting (London, UK – online) October 2020
- (5) ITA Planet Formation Group Seminar (Heidelberg, Germany – online) September 2020

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

- (1) API Exoplanets & Disks Group Meeting (Amsterdam, The Netherlands) September 2019
- (2) ESO Lunch Talk (Garching, Germany) September 2019
- (3) **From protoplanetary discs to planetary systems** (Kreuth, Germany) September 2019
- (4) MPIA Star and Planet Formation Coffee (Heidelberg, Germany) September 2019
- (5) **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) Steward Observatory Internal Symposium (Tucson, AZ) September 2016
  - (3) **Emerging Researchers in Exoplanets Symposium** (Ithaca, NY) June 2016
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## POSTERS (selected)

- [1] **Hammer, M.**, Lin, M.-K., Kratter, K., Pinilla, P., 2020, *Planet-induced vortices: What happens if you include a realistic planet growth timescale?*, Planetesimal Formation Meeting, Lund Observatory – online
  - [2] **Hammer, M.**, Jílková, L., Portegies Zwart, S., 2015, *Transferring Mass between Circumstellar Disks during Stellar Flybys*. AAS Meeting 225, #349.02
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## WORKSHOPS

- [1] Alan Alda Science Communication Workshop (Tucson, AZ) February 2019
  - [2] NExSS Winter School: *Planetary Habitability* (Oracle, AZ) February 2016
  - [3] NExSci Sagan Workshop: *Exoplanet Demographics* (Pasadena, CA) July 2015
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