

## Logan J. Prust

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### Research Interests

- Astrophysical fluids
- Computational physics
- Magnetohydrodynamics
- Moving-mesh hydrodynamics
- Stellar interactions

### Employment

**Kavli Institute for Theoretical Physics (KITP)** ..... **Santa Barbara, CA**  
*Postdoctoral Scholar* ..... Sept 2022 – Present  
**Supervisor:** Lars Bildsten

### Education

**University of Wisconsin-Milwaukee (UWM)** ..... **Milwaukee, WI**  
*Ph.D. Physics* ..... Aug 2017 – May 2022  
**Adviser:** Philip Chang  
**Thesis:** Simulating the Common Envelope Phase Using Moving-Mesh  
Hydrodynamics

**Iowa State University (ISU)** ..... **Ames, IA**  
*B.S. Aerospace Engineering* ..... Aug 2011 – Dec 2016  
*B.S. Physics*  
*B.S. Mathematics*  
*Minor in Astronomy*  
*Magna cum laude*

### Research Experience

**Graduate Research Assistant (UWM Dept. of Physics)** ..... **Milwaukee, WI**  
• **Adviser:** Philip Chang ..... May 2018 – May 2022  
**Undergraduate Research Assistant (ISU)** ..... **Ames, IA**  
• **Adviser:** Amanda Weinstein ..... May – Sept 2016  
• **Adviser:** Marzia Rosati ..... May – Aug 2014

## Teaching Experience

### **Graduate Teaching Assistant (UWM Dept. of Physics).....Milwaukee, WI**

- Phys 720: Electrodynamics I (Grader) (Spring 2020)
- Phys 441: Introduction to Quantum Mechanics (Fall 2019)
- Physics Tutor (Fall 2019)
- Astron 103: Survey of Astronomy (Spring 2019)
- Phys 122: General Physics II, Non-Calculus Treatment (Fall 2017; Fall 2018)
- Phys 120: General Physics I, Non-Calculus Treatment (Spring 2018)

### **Undergraduate Teaching Assistant (ISU) .....Ames, IA**

- Aer E 351: Astrodynamics I (Fall 2015; Spring 2016; Fall 2016)
- Aer E 192: Aerospace Seminar (Spring 2013)

### **Grader (ISU) .....Ames, IA**

- Various courses, including Aer E 310: Aerodynamics I, EM 274: Engineering Statics, EM 324: Mechanics of Materials, and EM 345: Engineering Dynamics.

## Awards and Distinctions

- Recipient of a UWM R1 Distinguished Dissertation Fellowship (2021-2022).
- Recipient of the Papastamatiou Scholarship for an outstanding graduate student in theoretical physics from the UWM Dept. of Physics (2021).
- Recipient of a UWM Distinguished Dissertation Fellowship (2020-2021).
- Recipient of a Wisconsin Space Grant Consortium Graduate & Professional Research Fellowship: Summer 2019; Summer 2020; Summer 2021.
- Recipient of a UWM Chancellor's Graduate Student Award: Fall 2017; Spring 2018; Fall 2018; Spring 2019; Fall 2019; Spring 2020; Fall 2020.
- Recipient of a Research Excellence Award, from the UWM Dept. of Physics: Fall 2017; Spring 2018; Fall 2018; Spring 2021.
- Induction into the Phi Beta Kappa National Honor Society (2015) at ISU.
- Recipient of the Jun Ye & Huiqing Wang Award for outstanding academic performance from the ISU Physics Dept. in both 2014 and 2015.

## Presentations and Seminars

### **Morphology and Entropy Dependence of Subsonic Bondi-Hoyle Accretion** Oct 2023

- Seminar talk, UCSB Astrophysics Theory Seminar (Santa Barbara, CA)

### **Black Hole Accretion as a Nozzle Flow** Oct 2023

- Blackboard talk, KITP Locals' Lunch (Santa Barbara, CA)

### **Flow Morphology in Planetary Engulfment Events** Sept 2023

- Session talk, ZTF Theory Network Meeting (Santa Margarita, CA)

### **Hydrodynamical Simulation Techniques in Astrophysics** Aug 2023

- Seminar talk, Graduate Simulation Seminar Series GS<sup>3</sup> (Santa Barbara, CA)

### **Flow Morphology in Planetary Engulfment Events** July 2023

- ePoster, EAS Annual Meeting 2023 (Krakow, Poland)

<b><i>Managing Friction in Planet-Star Relationships</i></b>	May 2023
• Seminar talk, UCSB Astrophysics Theory Seminar (Santa Barbara, CA)	
<b><i>Planetary Engulfment in Athena++</i></b>	May 2023
• Session talk, Flatiron Athena++ Workshop (New York, NY)	
<b><i>Flow Morphology of a Supersonic Gravitating Sphere</i></b>	Apr 2023
• Blackboard talk, KITP Locals' Lunch (Santa Barbara, CA)	
<b><i>Flow Morphology in Post-Main Sequence Planetary Engulfment</i></b>	Apr 2023
• Seminar talk, UCSB Astro Lunch (Santa Barbara, CA)	
<b><i>Long-Term Evolution in Simulations of the Common Envelope Phase</i></b>	Sept 2022
• Session talk, ZTF Theory Network Meeting (Santa Margarita, CA)	
<b><i>Modeling Common Envelopes on a Moving Mesh</i></b>	Sept 2022
• Blackboard talk, KITP Locals' Lunch (Santa Barbara, CA)	
<b><i>Simulating the Common Envelope Phase on a Moving Mesh</i></b>	Jun 2022
• Session talk, Flatiron N-Body Workshop (New York, NY)	
<b><i>New Physics in Simulations of the Common Envelope Phase</i></b>	Nov 2021
• Session talk, 2021 Midwest Relativity Meeting (Champaign, IL)	
<b><i>Moving Boundary Conditions in Common Envelope Evolution</i></b>	Aug 2021
• Contributed talk, Common Envelope Physics and Outcomes (Virtual)	
<b><i>Simulating Common Envelope Evolution on a Moving Mesh</i></b>	Aug 2021
• Session talk, Wisconsin Space Conference 2021 (Milwaukee, WI)	
<b><i>Moving and Reactive Boundary Conditions on a Moving Mesh</i></b>	Jan 2021
• Contributed talk, N-Body Shop Excellence Conference (Virtual)	
<b><i>Moving Boundary Conditions in Common Envelope Evolution</i></b>	Oct 2020
• Session talk, 2020 Midwest Relativity Meeting (Notre Dame, IN)	
<b><i>Simulating the CE Phase Using Moving-Mesh Hydrodynamics</i></b>	Jul 2020
• Contributed talk, EAS Annual Meeting 2020 (Leiden, Netherlands)	
<b><i>Moving-Mesh Hydrodynamics Using MANGA</i></b>	Dec 2019
• Seminar talk, CGCA Seminar Series (Milwaukee, WI)	
<b><i>Simulating the Common Envelope Phase in Binary Stars</i></b>	Aug 2019
• Session talk, Wisconsin Space Conference 2019 (Platteville, WI)	
<b><i>CEE on a Moving Mesh with MANGA</i></b>	May 2019
• Contributed talk, Flatiron CEE Workshop (New York, NY)	
<b><i>Common Envelope Evolution on a Moving Mesh</i></b>	Oct 2018
• Session talk, 2018 Midwest Relativity Meeting (Milwaukee, WI)	

## Other Workshops Attended

<b><i>Stellar Interactions and the Transients They Cause</i></b>	July 2023
• Aspen Center for Physics (Aspen, CO)	
<b><i>Physics and Astrophysics of Common Envelopes (PACE)</i></b>	May 2022
• Los Alamos National Laboratory (Los Alamos, NM)	
<b><i>MESA Summer School</i></b>	Aug 2019
• UC Santa Barbara (Santa Barbara, CA)	

## Refereed Publications

1. Morphology and Entropy Dependence of Subsonic Bondi-Hoyle Accretion  
**Logan Prust**, Hila Glanz, Lars Bildsten, Hagai Perets, Fritz Röpke  
Submitted to *ApJ*
2. Robust Geometric Modeling of the Supernova 1993J Ejecta at Radio Wavelengths  
Joseph Farah, Giacomo Terreran, D. Andrew Howell, Michael Bietenholz, Norbert Bartel, **Logan Prust**, Curtis McCully, Lars Bildsten, Michael Johnson  
In preparation
3. Flow Morphology of a Supersonic Gravitating Sphere  
**Logan Prust**, Lars Bildsten  
2024, *Monthly Notices of the Royal Astronomical Society*, 527, 2869-2886
4. Envelope Ejection and the Transition to Homologous Expansion in Common-Envelope Events  
Vinaya Valsan, Sarah Villanova-Borges, **Logan Prust**, Philip Chang  
2023, *Monthly Notices of the Royal Astronomical Society*, 526, 5365-5373
5. The Effect of Hydrodynamic Forces on Common Envelope Evolution  
**Logan Prust**  
Submitted to *Monthly Notices of the Royal Astronomical Society*
6. The Role of Radiation in Common Envelope Evolution  
**Logan Prust**  
2022, *Proceedings of the Wisconsin Space Conference*, doi: 10.17307/wsc.v1i1.346
7. Moving Boundary Conditions in Common Envelope Evolution  
**Logan Prust**  
2022, *Proceedings of the Wisconsin Space Conference*, doi: 10.17307/wsc.v1i1.327
8. Moving and Reactive Boundary Conditions in Moving-Mesh Hydrodynamics  
**Logan Prust**  
2020, *Monthly Notices of the Royal Astronomical Society*, 494, 4616-4626
9. Common Envelope Evolution on a Moving Mesh  
**Logan Prust**  
2020, *Proceedings of the Wisconsin Space Conference*, doi: 10.17307/wsc.v1i1.306
10. Common Envelope Evolution on a Moving Mesh  
**Logan Prust** & Philip Chang  
2019, *Monthly Notices of the Royal Astronomical Society*, 486, 5809-5818