

Parisa Mostafavi

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Laurel, MD 20723 *E-mail:* parisa.mostafavi@jhuapl.edu
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RESEARCH INTERESTS

- Theoretical and computational plasma physics
- Structure of shocks in the heliosphere and the interstellar medium
- Interaction of the heliosphere with the local interstellar medium

EDUCATION **The University of Alabama in Huntsville**, Huntsville, AL
Ph.D. in Space Science, Spring 2014 - Summer 2019

- Thesis: “Shock Waves and Nonlinear Plasma Waves Mediated by Pickup Ions and Energetic Particles”
- Advisor: Prof. Gary P. Zank
- GPA: 4.0/4.0

The University of Alabama in Huntsville, Huntsville, AL
M.S. Space Science, Spring 2014 - 2017

- GPA: 4.0/4.0

Shahid Beheshti University, Tehran, Iran
M.S. Plasma Engineering, Sep. 2010 - Jan. 2013

- Thesis: “Simulation of Filamentation Instability by Particle in Cell Method”

Science and Research University, Tehran, Iran
B.S. in Engineering Physics, Sep. 2005 - Sep. 2009

- Thesis: “Increasing the hydrophilic property of the polymer by using corona discharge”

RESEARCH AND TEACHING EXPERIENCE **Johns Hopkins University Applied Physics Laboratory**
Postdoctoral Fellow Oct 2019 - present

Princeton University
Visiting Research Collaborator Oct 2019 - present

The University of Alabama in Huntsville
Postdoctoral Research Assistant II Aug 2019 - Oct 2019

Princeton University
Visiting Student Research Collaborator 2018 - 2019
Advisor: Prof. David J. McComas

The University of Alabama in Huntsville
Graduate Research Assistant 2015 - 2019

The University of Alabama in Huntsville
Graduate Teaching Assistant 2014 - 2015
(General Physics Lab I, II, Astronomy Lab)

PUBLICATIONS

Journal Papers

1. **P. Mostafavi**, G. P. Zank, E. J. Zirnststein, D. J. McComas “The Effect of Inner Heliosheath Shocks on Energetic Neutral Atom Observations by IBEX,” *ApJ Letters*, 878, L24 (2019).
2. L. F. Burlaga, N. F. Ness, D. Berdichevsky, J. Park 1 , **P. Mostafavi**, and J. D. Richardson, “A Magnetic Pressure Wave Upstream of the Heliopause and The Heliosheath Magnetic Fields & Plasma, Observed During 2017,” *ApJ*, 877, 31 (2019).

3. G.M. Webb, S. Al-Nussirat, **P. Mostafavi**, A. F. Barghouty, Q. Hu, J. A. le Roux, and G. P. Zank, "Particle Acceleration by Cosmic Ray Viscosity in Radio-Jet Shear Flows," *ApJ*, (2019).
4. **P. Mostafavi**, G. P. Zank, and G. M. Webb, "The Mediation of Collisionless Oblique Magnetized Shocks by Energetic Particles," *ApJ*, 868:120, (2018).
5. G. P. Zank, L. Adhikari, L.-L. Zhao, **P. Mostafavi**, E. J. Zirnstien, and D. J. McComas "The Pickup Ion Mediated Solar Wind," *ApJ*, 869:23 (2018).
6. **P. Mostafavi** and G. P. Zank, "The Structure of Shocks in the Very Local Interstellar Medium," *ApJ Letters*, 1, 845, (2018).
7. **P. Mostafavi**, G. P. Zank, and G. M. Webb, "Structure of Energetic Particle Mediated Shocks Revisited," *ApJ*, 8, 414, doi: 10.3847/1538-4357/aa6f10, (2017).
8. G. P. Zank, P. Hunana, **P. Mostafavi**, J. A. Le Roux, Gang Li, G. M. Webb, O. Khabarova, A. Cummings, E. Stone, and R. Decker, "Diffusive Shock Acceleration and Reconnection Acceleration Process," *ApJ*, 814, 137, doi: 10.1088/0004-637X/814/2/137, (2015).
9. Zank, G. P. Hunana, **P. Mostafavi**, **P. Goldstein**, M. L. "Pickup Ion Mediated Plasmas. I. Basic Model and Linear Waves in the Solar Wind and Local Interstellar Medium," *ApJ*, 797, 87, doi: 10.1088/0004-637X/797/2/87. (2014).
10. A. R. Niknam, **P. S. Mostafavi**, D. Komaizi, and M. Salahshoor, "Simulation of filamentation instability of a current-carrying plasma by particle in cell method," *Phys. Plasmas* 19, 082119, doi: 10.1063/1.4748956 (2012).

Conference Papers

1. **P. Mostafavi** and G. P. Zank, "The Evolution of Interplanetary Shocks Propagating into the Very Local Interstellar Mediums," *Journal of Physics Conference Series*, 1100, 012018, (2018).
2. **P. Mostafavi**, G. P. Zank and G. M. Webb, "Shock Wave Structure in the Presence of Energetic Particles," *Journal of Physics Conference Series*, 900, 012016, (2017).
3. **P. Mostafavi**, G. P. Zank and G. M. Webb, "Pickup Ion Mediated Plasmas: Shock Wave Structure," *14th International Solar Wind Conference*, (2016).
4. G. P. Zank, **P. Mostafavi**, and P. Hunana, "The Modeling of Pickup Ion or Energetic Particle Mediated Plasmas," *Journal of Physics Conference Series*, doi: 10.1088/1742-6596/719/1/012014, (2016).
5. G. P. Zank, P. Hunana, **P. Mostafavi**, J. A. le Roux, G. M. Webb, O. Khabarova, A. Cummings, E. Stone, and R. Decker, "Particle acceleration and reconnection in the solar wind," *AIP Conference Proceedings*, 1720, 070011 (2016).
6. G. P. Zank, P. Hunana, **P. Mostafavi**, J. A. le Roux, Gang Li, G. M. Webb, and O. Khabarova, "Particle acceleration by combined diffusive shock acceleration and downstream multiple magnetic island acceleration," *Journal of Physics Conference Series*, 642, doi: 10.1088/1742-6596/642/1/012031 (2016).
7. Zank, G. P. Hunana, **P. Mostafavi**, **P.**, "Plasma Physics of the Very Local Interstellar Medium," *Journal of Physics Conference Series*, 577, 2025, doi: 10.1088/1742-6596/577/1/012025 (2015).
8. **Mostafavi, Parisa S**; Salahshoor, Mostafa; Komeizi, Davood; Niknam, Alireza, "Particle in cell simulation of the filamentation instability of two cold electron beams," (Persian Language) *The first conference in Plasma Engineering and Physics*, Shahid Beheshty University, (2013).

Posters

1. **P. Mostafavi**, G. P. Zank, and David J. McComas, "The structure of shock wave in the heliosphere and very local interstellar medium (VLISM)". *Princeton Research Day*, (May 2019).

2. **P. Mostafavi**, G. P. Zank, David J. McComas, and Eric J. Zirnstien, "Enhancement of Pickup Ion Pressure in the Inner Heliosheath and Possible Implications for Energetic Neutral Atom (ENA) Observations by IBEX". *AGU Fall Meeting*, (Dec. 2018).
3. **P. Mostafavi**, G. P. Zank, and G. Webb "The Mediation of Shock Waves by Suprathermal Particles". *13th International School/Symposium for Space Simulation*, (Sep. 2018).
4. **P. Mostafavi**, G. P. Zank, and G. Webb "The Structure of Heliospheric Shock Waves in the Presence of a Suprathermal PUI Population". *SHINE Meeting*, (Jul. 2018).
5. **P. Mostafavi** and G. P. Zank, "Shock Structure: Application to the heliospheric termination shock and an interstellar shock". *AGU Fall Meeting*, (Dec. 2017).
6. **P. Mostafavi**, G. P. Zank, and G. Webb, "Structure of Energetic Particle Mediated Shocks". *UAH Research Open House*, (Aug. 2017).
7. **P. Mostafavi**, G. P. Zank, and G. Webb, "Shock Wave Structure Mediated by Energetic Particles". *AGU Fall Meeting*, (Dec. 2016).
8. **P. Mostafavi**, "Combining Diffusive Shock Acceleration and Stochastic Particle Energization by Multiple Plasmoids". *8th Wernher von Braun Memorial Symposium*, (Oct. 2015).
9. **P. Mostafavi**, "Investigation of waves in the very local interstellar medium," *7th Wernher von Braun Memorial Symposium*, (Oct. 2014).

TALKS

- "Pickup Ion Energization by Inner Heliosheath Shocks and its Effect on IBEX ENA Observations," IBEX/IMAP Meeting, Santa Fe, NM, June 19 , 2019.
- "The Effect of Inner Heliosheath Shocks on Energetic Neutral Atom Observations by IBEX," 18th Annual International Astrophysics Conference, Pasadena, CA, Feb. 19 , 2019.
- "The Structure of Shock Waves in the Heliosphere and the Very Local Interstellar Medium," The Johns Hopkins University Applied Physics Laboratory, MD Jan. 23 , 2019.
- "Collisionality of the Very Local Interstellar Medium," Interstellar Probe Meeting, New York City, NY Oct. 10 , 2018.
- "Shock Wave Observations by Voyager 1 and 2," Joint Space Weather Camp, Huntsville, AL July 24, 2018.
- "Energetic Particles Mediated Heliospheric Shock Waves," COSPAR 2018 Meeting, Pasadena, CA, July 18, 2018.
- "Shock waves in the very local interstellar medium," COSPAR 2018 Meeting, Pasadena, CA, July 16, 2018.
- "Structure of Very Local Interstellar Shocks," NSF EPSCoR CPU2AL Annual Meeting, Huntsville, Al, June 14, 2018.
- "Investigating the Recent Observations of Voyager 1 and 2," Physics and Astronomy department, Rowan University, NJ, April 6, 2018.
- "The Structure of Shock Waves in the Very Local Interstellar Medium," Harvard-Smithsonian Center for Astrophysics, MA, March 29, 2018.
- "The Structure of Very Local Interstellar Shock Waves," 17th Annual International Astrophysics Conference, Santa Fe, NM, March 5, 2018.
- "Shock Wave Structure in the Presence of Energetic Particles," Joint Space Weather Camp, Huntsville, AL, July 6, 2017.
- "Structure of Energetic Particle Mediated Shocks Revisited," 16th Annual International Astrophysics Conference, Santa Fe, NM, March 7, 2017.
- "Structure of Energetic Particle Mediated Shocks," 10th Heliophysics Summer School, July 29, 2016.

AWARDS AND HONORS

- Graduate Research Award in the Collage of Science (2019)
- NASA Earth and Space Science Fellowship (**NESSF**) 2016-2019
- Academic Excellence Award from Dean of graduate studies (2015-2019)
- Honorary Member of Phi Kappa Phi
- Departmental Scholarship (The Department of Space Science, UAH, 2015)
- Current Number of Citations (Sep 2019): **179** (Google Scholar)

PEER REVIEW
ACTIVITIES

- The Astrophysical Journal; The Astrophysical Journal Letters

CONFERENCE
SESSION CHAIR

- IBEX/IMAP meeting, Santa Fe, NM, June 2019

ATTENDED SUMMER
SCHOOL

- September, 2018, 13th International School/Symposium for Space Simulation, California Institute of Technology University, Pasadena , CA.
- July - August, 2016, Heliophysics Summer School, Boulder, CO.
- July, 2014, BU summer school on plasma processes in space physics, Boston, MA.

PROFESSIONAL
SOCIETIES
MEMBERSHIP

- American Physical Society member
- American geophysical union member

TECHNICAL SKILLS

- Particle in Cell Simulation, MHD Fluid Simulation, Numerical Simulation
- Analytical Analysis
- C++, MATLAB, IDL, Mathematica