

# Fatemeh (Fatima) Bagheri

NSF Postdoctoral Fellow: Exoplanet and Planetary Science / Space Science

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Department of Physics, The University of Texas at Arlington

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## Education

- **PhD in Physics – Space Physics**  
University of Texas at Arlington, TX, USA (2020-2021)  
Dissertation: Energy Dissipation during Geomagnetic Storms.  
Total GPA: 3.9/4
- **PhD in Physics – Astrobiology, Exoplanets Science**  
Sharif University of Technology, Tehran, Iran (admission rate: <1% nationwide) (2021)  
Dissertation: Detection of Exoplanets using Space-based telescope via microlensing binary-source events  
Total GPA: 19.08/20
- **MSc in Physics – Cosmology, General Relativity**  
Sharif University of Technology Tehran, Iran (admission rate: <1% nationwide) (2013)  
Dissertation: Cosmological solutions of Einstein's equations with axial symmetry.  
Total GPA: 17.64/20
- **BSc in Physics – Theoretical Physics**  
Sharif University of Technology Tehran, Iran (admission rate: <1% nationwide) (2011)

## Computational Skills

2017 – Present	Working <b>with Supercomputers such as Texas Advanced Computing Center (TACC) and Cheyenne (NCAR, boulder)</b>
2016 – Present	MATLAB • Fortran; working on opensource programs on MCMC
2013 – Present	<b>Python:</b> Pandas, Matplotlib, Scipy, numpy, astropy,
2007 – Present	C/C++ • LaTeX

## Skills

Excellent problem solver • Critical thinking and analysis • Adaptative while persistent • **Grant writing** • Project Management • Mentorship

## Awards, Grants and Fellowships

2021-2023	<b>NSF- MPS/Ascend Postdoctoral Fellowship</b> <b>Amount:</b> \$200,000 <b>Awarded by:</b> National Science Foundation (NSF)
2021-2022	<b>APS Data Science Education Community of Practice (DSECOP) Fellowship</b> <b>Amount:</b> \$5,000 <b>Awarded by:</b> American Physical Society (APS)
2017 – 2018	Visiting Scholarship <b>Amount:</b> \$7,500 <b>Awarded by:</b> Department of Science, Research and Technology of Iran

2017 – 2018	Visiting Scholarship	
	Amount:	\$6,000
	Awarded by:	National Elites Foundation of Iran
	Selection Criteria:	Excellence in graduate research
2017 – 2018	Visiting Scholarship	
	Amount:	\$3,000
	Awarded by:	The Science Elites Federation of Iran
	Selection Criteria:	Excellence in graduate research
2016 – 2017	National Elites Foundation's Research Fellowship	
	Amount:	\$2,500
	Awarded by:	National Elites Foundation of Iran
	Selection Criteria:	Excellence in graduate studies

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### **USA Work Permit Status:** Permanent Resident of The United States

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## **Appointments**

### **NSF Postdoctoral Fellow**

2021–present Department of Physics, The University of Texas at Arlington: Planetary/Space Science

#### Research Assistant

2018 – 2021 Department of Physics, The University of Texas at Arlington: Space Science  
 2013 – 2017 Department of Physics, Sharif University of Technology: Planetary Science, Astrobiology  
 2011 – 2013 Department of Physics, Sharif University of Technology: Cosmology, General Relativity

#### Visiting Scholar

2017 – 2018 Department of Astronomy, The University of Texas at Austin: Planetary science, Astrobiology

#### Teaching Assistant

2017 – Spring General Physics I Laboratory, Junior Undergraduate,  
 Department of Physics, Sharif University of Technology  
 2015 – 2016 Astronomy/ Analytical Mechanics II, Senior Undergraduate,  
 Department of Physics, Sharif University of Technology  
 2014 – 2015 Analytical Mechanics I & II, Senior Undergraduate,  
 Department of Physics, Sharif University of Technology  
 2013 Mathematical Physics II, Senior Undergraduate,  
 Department of Physics, Sharif University of Technology  
 2012 Electroacoustics, Senior Undergraduate,  
 Department of Physics, Sharif University of Technology  
 2011 Mathematical Physics I, Senior Undergraduate,  
 Department of Physics, Sharif University of Technology

## Publication

2022:

Title: Comparison of Empirical Models of Ionospheric Heating to Global Simulation  
 Authors: **Fatemeh Bagheri**, Ramon E. Lopez  
 Journal: Journal of Space Weather Research (submitted)

Title: An alternative statistical interpretation for the first direct evidence of Collapsars  
 Authors: Joshua Alexander Osborne, Christopher Michael Bryant, **Fatemeh Bagheri**, Amir Shahmoradi  
 Journal: Monthly Notices of the Royal Astronomical Society (MNRAS) (submitted)

Title: Solar Wind Magnetosonic Mach Number as a Control Variable for Energy Dissipation during Magnetic Storms  
 Authors: **Fatemeh Bagheri**, Ramon E. Lopez  
 Journal: published in Frontiers in Astronomy and Space Science  
<https://doi.org/10.3389/fspas.2022.960535>

Title: Bayesian Methods for Inferring Missing Data in the BATSE Catalog of Short Gamma-Ray Bursts  
 Authors: Joshua. A. Osborne, **Fatemeh Bagheri**, Amir Shahmoradi  
 Journal: published in Universe  
<https://doi.org/10.3390/universe8050267>

Title: ParaDRAM: A Cross-Language Toolbox for Parallel High-Performance Delayed-Rejection Adaptive Metropolis Markov Chain Monte Carlo Simulations  
 Authors: Amir Shahmoradi, **Fatemeh Bagheri**  
 Journal: Computer Methods in Applied Mechanics and Engineering (accepted, in press)

2021:

Title: Are there radio-loud and radio-quiet Gamma-Ray Bursts?  
 Authors: Joshua. A. Osborne, **Fatemeh Bagheri**, Amir Shahmoradi  
 Journal: published in Monthly Notices of the Royal Astronomical Society (MNRAS)  
<https://doi.org/10.1093/mnras/stab425>

Title: Fast fully-reproducible serial/parallel Monte Carlo and MCMC simulations and visualizations via ParaMonte::Python library  
 Authors: Amir Shahmoradi, **Fatemeh Bagheri**, Joshua A. Osborne  
 Journal: Journal of Open Source Software (submitted)

Title: ParaMonte: A high-performance serial/parallel Monte Carlo simulation library for C, C++, Fortran  
 Authors: Amir Shahmoradi, **Fatemeh Bagheri**  
 Journal: published in Journal of Open Source Software  
<https://doi.org/10.21105/joss.02741>

2019:

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Title: Detection of Exoplanet as a Binary Source of Microlensing Events in WFIRST Survey  
 Authors: **Fatemeh Bagheri**, Sedigheh Sadjadian, Sohrab Rahvar  
 Journal: published in Monthly Notices of the Royal Astronomical Society (MNRAS)  
<https://doi.org/10.1093/mnras/stz2682>

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2014:

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Title: The symmetry of the energy momentum tensor does not necessarily reflect the space-time symmetry: a viscous axially symmetric cosmological solution  
 Authors: **Fatemeh Bagheri**, Reza Mansouri  
 Journal: <http://arxiv.org/abs/1408.0516>

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### Synergistic Activities

2022 –present	Created and taught two educational modules for deep learning and random forest methods for undergraduate students in physics (As an APS DESCOP Fellow)
2022 – 2023	Mentoring two undergraduate students: Rana Abdolaziz and Anshuman Rajesh Garga at The University of Texas at Arlington
2019 – 2021	Mentoring two undergraduate students: Chelsi Nelson and Rushikesh Patil at The University of Texas at Arlington
2013 – 2014	Developed and taught a course with title “Critical Thinking” for students in Mobina High School. Tehran, Iran.
2012 – 2013	Organized three Scientific Experiments Workshops for the Hight school students in Mobina High School. Tehran, Iran.

### Organization Memberships:

- American Astronomical Society (AAS)
- American Geophysical Union (AGU),
- American Physical Society (APS)

## Conferences and Workshops

- 2022 26. 241 St Meeting of The American Astronomical Society  
Seattle (WA), 8-12 January 2023  
Oral Presentation: [A Study of Exoplanets Magnetosphere Interactions with Stellar Winds using MHD Simulations](#)
25. 2022 Sagan Summer Workshop  
July 25-29, 2022  
Hosted by the Nasa Exoplanet Science Institute, California Institute of Technology, Pasadena, CA
24. Geospace Environment Modeling (GEM) Summer Workshop  
Hawaii (HI), June 19-26, 2022  
Poster Presentation: Comparison of Empirical Models of Ionospheric Joule Heating to Global Simulations
23. Exoplanet IV  
Los Vegas (NV), May 1-6, 2022  
Poster Presentation: [Direct Detection of Exoplanets in Microlensing Events](#)
- 2021 22. 2021 Fall Meeting of the American Geophysical Union  
New Orleans (LA), December 13-17, 2021  
Poster Presentation: Comparison of Empirical Models of Ionospheric Joule Heating to Global Simulations
21. 2021 Geospace Environment Modeling (GEM) Summer Workshop  
July 26-30, 2021 (virtual)  
Poster Presentation: An overview of ionospheric currents on October 8-9, 2012: A CUSIA Event Study
- 2020 20. 2020 Fall Meeting of the American Geophysical Union  
December 7-11, 2020 (virtual)  
Poster Presentation: Correlation between Solar Wind Density and Ionospheric Electrojets during the Main Phase of Magnetic Storms
19. Fall 2020 Meeting of the American Physical Society Texas Section  
Arlington, TX, November 12-14, 2020 (virtual)  
Oral Presentation: Energy Dissipation in Storms with Low Solar Wind Magnetosonic Mach Number
18. 2020 Geospace Environment Modeling (GEM) Summer Workshop  
July 20-23, 2020 (virtual)  
Poster Presentation: Correlation between solar wind density and ionospheric electrojets during the main phase of magnetic storms
17. 2020 March Meeting of the American Physical Society  
Denver, CO, March 2-6, 2020 (virtual)
- 2019 16. 2019 Fall Meeting of the American Geophysical Union  
San Francisco, CA, December 9-13, 2019  
Poster Presentation: [Multipoint Observations of Solar Wind Conditions and Magnetopause Motion](#)

15. Fall 2019 Meeting of the American Physical Society Texas Section  
Lubbock TX, October 24-26, 2019  
Oral Presentation: [Identifying Magnetospheric Crossings between Northward and Southward IMF](#)
14. Boulder Space Weather Summer School (SWSS)  
National Center for Atmospheric Research, Boulder, CO, July 8-19, 2019
13. 2019 April Meeting of the American Physical Society  
Denver, CO, April 13-16, 2019  
Oral Presentation: [The symmetry of the energy momentum tensor does not necessarily reflect the space-time symmetry: a viscous axially symmetric cosmological solution](#)  
Poster Presentation: [Exoplanet Detection by Spitzer via Microlensing Events](#)
12. 2019 March Meeting of the American Physical Society  
Boston, MA, March 4-8, 2019
- 2018 11. Understanding of Planetary Habitability-Pop-up institute  
The University of Texas at Austin, June 12-July 19, 2018
10. 2018 March Meeting of the American Physical Society  
Los Angeles, CA, March 5-9, 2018
- 2016 9. Cosmology with Next Generation Radio Surveys  
ICTP, Trieste, Italy, June 20-23, 2016
8. Summer School in Cosmology  
ICTP, Trieste, Italy, June 6-17, 2016
7. Spring Physics Conference  
Institute of Research in Fundamental Sciences (IPM), Tehran, May 2016
6. String Theory Spring School and Workshop  
Institute of Research in Fundamental Sciences (IPM), Tehran, April 27- May 1, 2016
5. International Conference on Modified Gravity  
School of Astronomy, Institute of Research in Fundamental Sciences (IPM), January 23-26, 2016
- 2015 4. National Gravity and Cosmology Annual Meeting of Iran  
Sharif University of Technology, Tehran, January 2015
- 2013 3. Spring Physics Conference  
Institute of Research in Fundamental Sciences (IPM), Tehran, May 2013
2. National Gravity and Cosmology Annual Meeting of Iran  
Shahid Beheshti University, Tehran, January 2013
- 2012 1. National Gravity and Cosmology Annual Meeting of Iran  
University of Tehran, Tehran, February 2012

## References

### **Ramon E. Lopez, PhD**

Professor of Physics, The University of Texas at Arlington  
Member, U.T. System & U.T. Arlington Academy of Distinguished Teachers  
Relationship: PhD Adviser, (2020 – 2021)

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### **Zdzislaw E Musielak, PhD**

Professor of Physics, The University of Texas at Arlington  
Relationship: PhD Professor, (2020-2021)

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### **Sohrab Rahvar, PhD**

Professor of Physics, Sharif University of Technology  
Adjunct Professor, Perimeter Institute of Theoretical Physics  
Relationship: PhD Adviser (2013 – 2019)

#### Contact Information:

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Sharif University of Technology  
Azadi Avenue, Tehran, IRAN  
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### **Ahmad Amjadi, PhD**

Professor of Physics, Sharif University of Technology  
Relationship: Teaching Co-Adviser (2011 – 2015)

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