India Jackson

NSF AGS Postdoctoral Fellow

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EDUCATION

May 2024	Ph.D. Astrophysics	Georgia State University
May 2024	M.S. Computer Science	Georgia State University
Aug 2023	M.S. Physics	Georgia State University
May 2013	M.S. Mathematics	Georgia State University
Dec 2010	B.S. Mathematics	Georgia State University

RESEARCH INTERESTS

My research integrates heliophysics, artificial intelligence, scientific cyberinfrastructure, and space science policy to advance both the understanding and accessibility of space weather. I study solar eruptive events, solar energetic particle (SEP) propagation, and radiation impacts on human spaceflight and technological systems. I develop machine learning methods, including computer vision and time series analysis, alongside cloud-based data pipelines to enable scalable, interoperable analysis of heterogeneous datasets (e.g., FITS, CDF, NetCDF). My work is driven by a broader goal of improving scientific accessibility through data standardization, infrastructure, and policy.

FUNDING

National Science Foundation Atmospheric and Geospace Sciences Postdoctoral Fellowship — $202,000 (*active*)
International Astronomical Union, *The Women and Girls in Astronomy* — $2,000 (*completed*)
TOTAL: $204,000

EXPERIENCE

RESEARCH

Jan 2025   NSF Atmospheric and Geospace Sciences Postdoc Fellow   Georgia State University (Host)
Lead independent research on AI/ML-driven space weather forecasting, including software development, conference engagement, and publication.

June 2024   Summer Postdoctoral Fellow   Frontier Development Lab
Developed physics-informed machine learning models in collaboration with academic and industry partners to improve space weather forecasting during the FDL-X HelioLab research sprint.

Feb 2024   NASA Heliophysics Mission Design School   Jet Propulsion Lab
Designed a concept heliophysics mission using hypothesis-driven frameworks, incorporating instrument selection, cost trade-offs, and concurrent engineering principles.

June 2023   NASA HelioAnalytics Intern   Goddard Space Flight Center
Applied machine learning to heliophysics by annotating coronal mass ejections with Computer Vision Annotation Tool (CVAT) and converting datasets from COCO to YOLO format, improving YOLOv7 performance through parameter evaluation.

June 2019   NASA Statistics Intern   Johnson Space Center
Built a comprehensive SEP database and developed statistical models linking solar flares, CMEs, and SEPs across Solar Cycle 24 to support ISEP validation.

Aug 2017   Graduate Research and Teaching Assistant   Georgia State University

Applied survival analysis and machine learning to predict solar energetic particle detection times. Contributed to development of a cloud-based AWS research environment for large-scale heliophysics data.

POLICY

June 2025   **HelioCoalition Congressional Visits**   **Washington, DC**
Engaged with legislators to advocate for sustained investment in heliophysics, space weather forecasting, and solar physics missions and infrastructure.

April 2025   **AAS Congressional Visits Day**   **Washington, DC**
Met with members of Congress to advocate for increased federal funding in physics and astronomy research and to discuss priorities outlined in the Decadal Survey.

TRAINING & PROFESSIONAL DEVELOPMENT

July 2026   **INTERSECT Software Engineering Bootcamp (*upcoming*)**   **Princeton**
Selected as a Summer Scholar for training in reproducible and sustainable scientific software development.

Nov 2024   **Culturally Inclusive Planetary Engagement Workshop**   **Agnes Scott College**
Participated in a Planetary ReaCH workshop on culturally inclusive public engagement in planetary science.

Oct 2024   **HelioLab Research Horizons Workshop**   **Google (PartnerPlex)**
Selected for a workshop on AI applications in heliophysics hosted by NASA, FDL-X, and Google Cloud.

June 2018   **Living With a Star & Boulder Space Weather Program**   **UCAR, NCAR, HAO**
Completed a summer program on heliophysics, including solar wind, magnetic fields, and space weather processes.

TEACHING

Mathematics	College Algebra, Trigonometry, Statistics, Calculus I — III	GSU; Clark Atlanta Uni
Physics	1111 (lecture/lab), 1112 (lecture/lab), 2211 (lab), 2212 (lab)	GSU
Astronomy	1111 (lab), 1112 (lab)	GSU
Comp Sci	Supervised Machine Learning Instructor (*upcoming*)	NRAO; CosmicAI

PUBLICATIONS

PEER-REVIEWED

- Jackson, I., Aydin, B., & Martens, P. (2026). Helio-Lite: An Open Cloud Framework for Advancing Heliophysics Research. *Journal of Open Research Software, 14(1),3*. https://doi.org/10.5334/jors.519
- Chibueze, J. O., Farid, S., Jackson, I., et al. (2025). *Black in stellar astrophysics. Nature Astronomy, 9*, 760–766. https://doi.org/10.1038/s41550-025-02578-8
- Jackson, I., & Martens, P. (2024). Advancing solar energetic particle event prediction through survival analysis and cloud computing. I. Kaplan–Meier estimation and Cox proportional hazards modeling. *The Astrophysical Journal Supplement Series, 272*(2), 37. https://doi.org/10.3847/1538-4365/ad3fba

SOFTWARE, DATA & CYBERINFRASTRUCTURE

- Jackson, I. (2025). FitsFlow: A Browser-Based Heliophysics Tool for FITS Exploration (v0.1.0). Apache 2.0 License. https://doi.org/10.5281/zenodo.17069414
- Jackson, I., Martens, P., & Berkay, A. (2025). Helio-Lite (v0.1.0). MIT License. https://doi.org/10.5281/zenodo.17611741
- Jackson, I., & Martens, P. (2024). Survival Solar Energetic Particle (SSEP) Dataset. Harvard Dataverse. https://doi.org/10.7910/DVN/GXY9MZ

INTELLECTUAL PROPERTY

- Event-Driven Methods for Distributed Semantic Chunking and Manifest-Defined Processing of Digital Data Objects. *Patent Pending — Filed January 2026*

PUBLIC-FACING
- Jackson, I. (2025). *Our Solar System: A Coloring Journey from the Sun to Neptune*. Amazon KDP. https://a.co/d/098UZyHc

INVITED TALKS

"From Space Weather Scientist to Space Weather Advocate: Follow the Source of Your Funding"

Feb 2026	ComSciCon-ATL	Georgia Institute of Technology

"The Active Sun: How Solar Physics Connects to Life and Technology on Earth"

Oct 2025	Department of Physics	Oglethorpe University
Oct 2025	Department of Mathematics	Clark Atlanta University

"Developing a Real-Time Solar Event Detection Framework Using CV/ML and Cloud Integration"

May 2025	Institute for Space Weather Sciences	New Jersey Institute of Technology
April 2025	NASA Heliophysics Division	Goddard Space Flight Center

"Geo-Cloak: Operational Machine Learning Tool for Global Geomagnetic Field Perturbation Forecasting"

Sept 2024	Department of Physics & Astronomy	Agnes Scott College
Sept 2024	Black in Astro Speaker Series	BlackInAstro
Sept 2024	Department of Mathematics	Clark Atlanta University

"Unlocking the Mysteries of Space Weather with Computer Vision, Geometry, and ML"

Feb 2026	AstroAI and Solar Stellar Group	Harvard-Smithsonian Center for Astrophysics

"Bridging the Gap: Advancing SEP Forecasting through Survival Analysis and ML in the Cloud"

Oct 2023	CfA Seminar	Harvard-Smithsonian Center for Astrophysics

CONFERENCE PROCEEDINGS & ABSTRACTS

Jackson, I. (2025). FitsFlow: A Cyberinfrastructure, Browser-Based, Cloud-Native Platform for Machine Learning–Ready Processing of Solar FITS Data. *Data, Analysis, and Software in Heliophysics (DASH).* https://doi.org/10.5281/zenodo.17382533

Jackson, I. (2025). FitsFlow: A Browser-Based Heliophysics Tool for FITS Exploration. *Science and Cyberinfrastructure for Discovery*. https://doi.org/10.5281/zenodo.17069414.

Jha, B. K., Pandey, C., Issan, O., Jackson, I., Heyns, M., Mukundan, R., Upendran, V., Ferdousi, B., Tigas, P., Saleem, H., & Lavin, A. (2024). Geo-Cloak: Operational machine learning tool for global geomagnetic field perturbation forecasting. *2024 American Geophysical Union (AGU)*. https://ui.adsabs.harvard.edu/abs/2024AGUFMSM11C..06J

Nina Abramzon, Mary K. Chessey, Ximena Cid, Beth Cunningham, Jessica Esquivel, Hume A. Feldman, Alina Gearba-Sell, India Jackson, Yasemin Kalender, Caitlin Kepple, Anne F. Kornahrens, Sandra Liss, Stephanie Lyons, Arlene Maclin, Laura McCullough, Dana Molloy, Artemis Spyrou, Sarah Sublett, Stephanie M. Williams, Sherry Yennello; Celebrating the successes of women physicists over the past 50 years in the United States. *AIP Conf. Proc.* 17 November 2023; 3040 (1):050042. https://doi.org/10.1063/5.0175795

Thomas, B. A., Alzate, N., Kirk, M. S., & Jackson, I. (2023). Advancing heliophysics data analysis through machine learning: Utilizing YOLOv7 for automated cataloging of SOHO/LASCO C2 images (Art. no. NG13B-0614). *2023 American Geophysical Union (AGU)*. https://ui.adsabs.harvard.edu/abs/2023AGUFMNG13B0614T/abstract

Jackson, I., & Whitman, K. (2019). Building a database of SEP events informed by statistical relationships between flares, CMEs, and SEPs. *Solar Heliospheric and INterplanetary Environment (SHINE)*. https://ui.adsabs.harvard.edu/abs/2019shin.confE.237J/abstract

PUBLIC OUTREACH

PROFESSIONAL GUEST

Feb 2026	Clayton County Stem Expo	Forest Park, GA
Sept 2025	Dragon Con Science Track	Atlanta, GA

ASTRONOMY DAY

Nov 2025	Oakview Elementary School	Decatur, GA
Oct 2025	Fountain Elementary School	Forest Park, GA
Oct 2019	Public Observing Night	HLCO; Rutledge, GA

CAREER DAY SPEAKER

March 2026	Fountain Elementary School	Forest Park, GA
April 2025	Martin Luther King Jr. High School	Stonecrest, GA

SELECTED MEDIA

EXPERT COMMENTARY & INTERVIEWS

April 2025	Ologies Podcast, *Discussed heliophysics for broad audience*	Listen
Feb 2025	National Public Radio, *Interview on impacts of federal funding freeze*	Listen
May 2024	National Public Radio, *Provided expert analysis on solar activity*	Listen
Dec 2023	National Public Radio, *Provided expert analysis on solar activity*	Listen

FEATURES & PROFILES

May 2024	Atlanta Journal-Constitution, *Article detailing my trip to NASA JPL*	View
Sept 2019	Georgia Public Broadcasting, *Interview detailing crowd funding for NASA Internship*	Listen
Aug 2019	GSU Magazine, *Cover Feature — Spread detailing my academic journey*	View

SCIENTIFIC SERVICE

Panel Reviewer, *NASA Science Mission Directorate, Research Opportunities in Space and Earth Sciences (ROSES)*
Serves as a confidential peer reviewer for NASA proposals in the space and Earth sciences.

Code Reviewer*, AGU JGR Machine Learning and Computation*
Evaluate submitted research software to ensure open access, documentation quality, and reproducibility of results in accordance with AGU's data and software policy.

AWARDS & HONORS

2025	40 Under 40	Georgia Trends
2024	40 Under 40	GSU
2020	Presidential Scholar	African American Women in Physics
2004	Presidential Scholar	Boys and Girls Club of Metro Atlanta

PROFESSIONAL MEMBERSHIPS

2017	American Astronomical Society	
2017	American Geophysical Union	
2017	African American Women in Physics	

2017   National Society of Black Physicists

COMPUTATIONAL SKILLS

Languages: Python, JavaScript, Java, C#
ML & Data Science: scikit-learn, TensorFlow, PyTorch, computer vision
Cloud & Infrastructure: AWS, GCP, serverless architectures
Scientific Data Systems: FITS, HDF5, NetCDF, ASDF; SunPy, JSOC, Helioviewer
Web Development: HTML, CSS, Vue.js
Tools: Node.js, Unity, LaTeX, MATLAB