BRIANNA N. ISOLA

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Education

University of New Hampshire, *Durham, NH* Aug. 2020–Present
Ph.D. Physics

Stony Brook University, *Stony Brook, NY* Aug. 2016–May 2020
B.S. Physics, B.S. Astronomy

Highlighted Coursework: *High-Performance Computing, MHD of the Heliosphere, Data Mining & Predictive Analytics, Plasma Physics*

Experience

University of New Hampshire, **Graduate Research Assistant**, *Durham, NH* May. 2021–Present

- Work with Dr. Matthew Argall to develop the Machine learning Empirical Electric Potential (MEEP) Model: A neural network-driven model of the inner magnetospheric electric field trained with NASA MMS mission data.
- Characterizing particle dynamics by implementing particle tracing into global electric and magnetic field models for select geomagnetically quiet and active periods.
- Curating outreach events around the magnetosphere with the use of VR technology.

Los Alamos National Laboratory, **Summer Research Fellow**, *Los Alamos, NM* Jun. 2023–Aug. 2023

- Advised by Dr. Gian Luca Delzanno, Dr. Joe Borovksy, and Dr. Kareem Sorathia.
- Applied system science techniques to magnetohydrodynamic simulation: Canonical correlation analysis used to compare GAMERA MHD model with OMNI solar wind data.

Northwest Research Associates, **Research Intern**, *Boulder, CO* Aug. 2020–Dec. 2020

- Continuation of REU Research: Modeled the coronal magnetic field to quantify released energy during solar reconnection event.

Boulder Solar Alliance REU, **Research Intern**, *Boulder, CO* May 2019–Aug. 2019

- Modeled the coronal magnetic field using the CFITS non-linear force-free extrapolation code and identified individual current systems by looking at photospheric concentrations of current within the extrapolation volume to determine energy that might be released in a single reconnection event.
- Methodology included use of IDL and Fortran.

Flatiron Center for Computational Astrophysics, **Summer Intern**, *New York, NY* Jun. 2018–Aug. 2018

- Estimated the probability of detection of two coalescing supermassive black holes in eccentric orbit using Python.
- Attended weekly journal club at the American Museum of Natural History.

Honors, Awards & Fellowships

- **Vela Fellowship** (2023), *Los Alamos National Laboratory.*
  Awarded to selected students of the Space Weather Summer School.
- **603 Challenge Travel Grant Award** (2023), *University of New Hampshire.*
  Awarded to attend the SIGGRAPH 2023 conference.
- **NASA Space Grant Fellowship** (2021–2022), *NASA, New Hampshire Space Grant Consortium.*
  Selective fellowship awarded for research-based graduate study in NASA-related disciplines.
- **AGU Fall Meeting Student Travel Grant** (2019), *American Geophysical Union, Sponsor: Lockheed Martin.*
  Awarded to attend the AGU 2019 fall meeting for students with strong scientific merit demonstrated in submitted abstract and grant application.
- **NSF Travel Grant** (2019), *National Science Foundation, Boulder Solar Alliance REU.*
  Awarded to attend the AGU 2019 fall meeting as an REU student.
- **WISE (Women in Science and Engineering) Honor Society Scholarship** (2016–2020), *Stony Brook University.*
  Very selective award given to academically accomplished and well-rounded students with demonstrated aptitude and interest in STEM subjects.
- **Presidential Scholarship** (2016–2020), *Stony Brook University.*
  Awarded to seniors in high school who have achieved a meritorious unweighted high school average.

Skills

Programming	Python (Pandas, SunPy), C/C++ (Boost, OpenMP), IDL, FORTRAN
Technical	Regression analysis, PCA, Machine Learning (PyTorch, Tensorflow)
Software & Tools	ds9, IRAF, Adobe Suite (Photoshop, Illustrator, InDesign)

Academic Service & Development

Teaching
PHYS 407: General Physics I Lab – University of New Hampshire, Spring 2021
PHYS 407: General Physics I Lab – University of New Hampshire, Fall 2020

Workshops & Summer Schools
Machine Learning Summer School (March 4th–March 15th 2024), *Okinawa, Japan.*
Los Alamos National Lab Space Weather Summer School (June–July 2023), *Los Alamos, New Mexico.*
Python in Heliophysics Summer School (May 30th 2022–June 3rd 2022), *Madrid, Spain* (attended remotely).

Professional
University of New Hampshire Graduate Council (2023–Present)
Selected Student Volunteer, SIGGRAPH Conference (2023)
Graduate Student Senate Executive Committee, Community Coordinator (2023–Present)

Outreach

Citizen Continental-America Telescopic Eclipse (CATE) Project Feb. 2024 – Apr. 2024
`https://eclipse.boulder.swri.edu/`
I am selected to lead one of 35 teams across the United States to take data during the April 2024 total eclipse under the path of totality. Observation teams will generate high-dynamic-range images to study the lower to middle corona. Outside of eclipse day, my duties include attending training over a span of months to learn how to use the equipment. Provided equipment will be kept for future outreach events within my local community.

Presentations & Publications

[11] (★ *Invited*) **Isola, Brianna** et al. *Characterizing Particle Dynamics from a Data-Driven Model of the Inner Magnetospheric Electric Field*. Poster. American Geophysical Union Fall Meeting. San Francisco, CA., Dec. 2023.

[10] **Isola, Brianna** et al. *Particle dynamics derived from a data-driven model of the inner magnetospheric electric field*. Poster. Geospace Environment Modeling Workshop. San Diego, CA, June 2023.

[9] **Isola, Brianna** et al. *System Science Tools for MHD Simulations*. Oral Talk. American Geophysical Union Fall Meeting. San Francisco, CA., Dec. 2023.

[8] (★ *Invited*) **Isola, Brianna** et al. *System Science Tools for MHD Simulations*. Oral Talk. UNH EOS Space Science Seminar Series. Durham, NH., Oct. 2023.

[7] Izzak Boucher, Matthew R. Argall, and **Isola, Brianna**. *Global model of the electric potential using regularized linear regression and neural networks*. Oral presentation. Geospace Environment Modeling Workshop. Honolulu, HI, June 2022.

[6] **Isola, Brianna** et al. *A dynamic, 3D model of the inner magnetospheric electric field*. Poster. Geospace Environment Modeling Workshop. Honolulu, HI, June 2022.

[5] **Isola, Brianna** et al. *Characterizing particle dynamics from a data-driven model of the inner magnetospheric electric field*. Poster. American Geophysical Union Fall Meeting. Chicago, IL., Dec. 2022.

[4] Vincent E. Ledvina et al. "How open data and interdisciplinary collaboration improve our understanding of space weather: A risk and resiliency perspective". In: *Frontiers in Astronomy and Space Sciences* 9 (Dec. 2022). ISSN: 2296-987X.

[3] Izzak Boucher, Matthew R. Argall, and **Isola, Brianna**. *New Inner Magnetospheric Electric Field Model Maps Electric Potential using MMS data*. Oral presentation. MMS Community Workshop. Waterville Valley, NH, Oct. 2021.

[2] **Isola, Brianna** et al. *A neural network-driven approach to inner magnetospheric electric field modelling*. Poster. American Geophysical Union Fall Meeting. New Orleans. LA, Dec. 2021.

[1] **Isola, Brianna** et al. *The How and Why of Big Solar Flares*. Poster. American Geophysical Union Fall Meeting. San Francisco, CA., Dec. 2019.