Monica G. Bobra

Research Scientist
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Experience

Stanford University Hansen Experimental Physics Laboratory, Stanford CA

Research Scientist, April 2010 – present

- Developed a software pipeline to create and analyze a continuous stream of ultra-high definition images, approximately 1.5 terabytes a day, from NASA's *Solar Dynamics Observatory* (SDO), an $800 million satellite that transmits more data than any other mission in the NASA Heliophysics Division
- Published several first-author studies about predicting solar activity using machine learning, which garnered media attention from outlets such as the *San Jose Mercury News* and *Scientific American*, and continuing this work as Scientific Principal Investigator of a National Science Foundation grant
- Contributing to the open source scientific community as Vice-Chair of the SunPy Advisory Board and Editor for the Journal of Open Source Software (JOSS)
- Mentoring students through Google *Summer of Code*, NASA *Frontier Development Laboratory*, and Stanford University *Undergraduate Summer Research Program*
- Organizing conferences and workshops, such as *Python in Astronomy* (2020), *COSPAR Data Science Workshops* (2021), and *Machine Learning in Heliophysics* (2022)
- Communicating scientific results to the public as a Contributing Editor for *Sky & Telescope* magazine

Harvard-Smithsonian Center for Astrophysics, Cambridge MA

Astrophysicist, October 2005 – August 2007

- Designed and conducted flight hardware tests for NASA's *Hinode X-Ray Telescope* (XRT), the highest resolution X-ray telescope in history, and developed open source software to analyze its images
- Designed flight operations for the *Hinode* XRT and NASA's *Transition Region and Coronal Explorer* space telescopes from the Institute of Space and Astronautical Science (Japan) and NASA Goddard
- Analyzed the temperature of the Sun's atmosphere using *Hinode* data and published results in *Science*
- Won United Nations grant as Principal Investigator to lead solar data analysis workshops worldwide

Education

University of New Hampshire, Durham NH

Master of Science in Physics, September 2009

Boston University, Boston MA

Bachelor of Arts in Astronomy, May 2004
Bachelor of Science in Communication, May 2004

Selected Publications

The SunPy Community, Will T. Barnes, Monica G. Bobra, et al. "The SunPy Project: Open Source Development and Status of the Version 1.0 Core Package." 2020, *Astrophysical Journal*, 890, 1.

Monica G. Bobra and James P. Mason. "Machine Learning, Statistics, and Data Mining for Heliophysics." 2020; see *helioml.org*.

Eric Jonas, Monica Bobra, Vaishaal Shankar, Todd Hoeksema, Benjamin Recht. "Flare Prediction Using Photospheric and Coronal Image Data." 2018, *Solar Physics*, 293, 48.

Monica G. Bobra and Stathis Ilonidis. "Predicting Coronal Mass Ejections Using Machine Learning Methods." 2016, *Astrophysical Journal*, 821, 2.

Awards

NASA Group Achievement Award — *Hinode* Team (2007), NASA Space Grant Fellowship (2008-2009), Robert H. Goddard Exceptional Achievement for Science Award (2016), NASA Group Achievement Award — *Solar Dynamics Observatory* Team (2017), American Astronomical Society Solar Physics Division Popular Media Award (2021)

Service

Member, SunPy Board of Directors, 2017 – present
Editor, Journal of Open Source Software, 2019 – present
Member, National Academy of Sciences Heliophysics Mid-Decadal Committee, 2018 – 2020