

Monica G. Bobra

Principal Data Scientist

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Summary

I develop novel machine learning algorithms and apply them to complex data to glean insights and inform public decision-making. I develop open data and open source scientific software for data-intensive research. I provide expertise on the practice of data science, within academia and the public sector, by publishing papers, giving talks, organizing conferences, developing new communities, mentoring students, and serving on committees and boards.

Education

University of New Hampshire, Durham NH

M.S. Physics
JANUARY 2010

Boston University, Boston MA

B.A. Astronomy
B.S. Communication
MAY 2004

Skills

Python scientific software stack
Machine learning model development
together with interpretability tools
Statistical modeling
Data visualization
Cloud computing
Git (and CI/CD)

Awards

Robert H. Goddard Exceptional Achievement
for Science Award (2024)
NASA Group Achievement Award — SunPy
Development Team (2024)
American Astronomical Society Solar Physics
Division Popular Media Award (2021)
NASA Group Achievement Award — Solar
Dynamics Observatory Team (2017)
Robert H. Goddard Exceptional Achievement
for Science Award (2016)
NASA Space Grant Fellowship (2008 - 2009)
NASA Group Achievement Award — Hinode
Team (2007)

Experience

State of California, Office of Data and Innovation / Principal Data Scientist

MAY 2023 - PRESENT, SACRAMENTO & SAN FRANCISCO BAY AREA, CA

Serving as the technical lead for the Office's Data Science Accelerator, which partners with departments within data-rich agencies, such as the California Environmental Protection Agency and California Natural Resources Agency, to develop and implement novel machine learning models that improve safety, sustainability, and decision-making

Leading a statewide community of data scientists to co-develop best practices in ethical data science and briefing legislators on this work

Serving on advisory committees at NASA/JPL and Stanford University to effectively translate advances in research to improvements in operations across the State of California

Stanford University / Research Scientist

APRIL 2010 - JULY 2021, STANFORD CA

Published [several first-author studies](#) and [presented talks](#) on predicting solar flares using machine learning algorithms and multi-spectral, petabyte-scale image data taken by the NASA Solar Dynamics Observatory (SDO); served on the NASA SDO science team

Led two groups, both spanning multiple academic institutions and federal agencies, to predict space weather using machine learning methods as PI of NSF and NASA grants (\$1.8M total award)

Wrote science policy to inform the direction of data science at a federal level as a member of the National Academy of Sciences Heliophysics Mid-Decadal Committee (2020)

Led the development of open source software as Vice-Chair of the Board for SunPy, a founding member of the Python in Heliophysics community, and an editor for the Journal of Open Source Software

Led a culture of open scholarship at Stanford Data Science as a founding member of the Center for Open and REproducible Science

Harvard-Smithsonian Center for Astrophysics / Astrophysicist

OCTOBER 2005 - AUGUST 2007, CAMBRIDGE MA

Developed and published a numerical model of the solar magnetic field that accurately replicates observations by the JAXA/NASA Hinode and NASA TRACE satellites

Designed and conducted flight hardware tests and flight operations for

the Hinode X-Ray Telescope as a member of the science team