

Monica G. Bobra

Principal Data Scientist

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Summary

I have over a decade of experience working as a research scientist. 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 data science workflows by publishing papers, giving talks, organizing conferences, 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 including NumPy, SciPy, pandas, Matplotlib, SunPy, statsmodels, scikit-learn, PyTorch, xarray, TensorFlow, Dask, Vega-Altair and more)

Machine learning algorithms for image data, metadata, and time series data as well as interpretability tools

Statistical Modeling

Data Visualization

Cloud computing (AWS, GCP)

Git (and CI/CD)

Awards

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

Leading data science projects with departments, such as the California Environmental Protection Agency, by conducting and operationalizing scientific research designed to improve community safety, sustainability, and decision-making

Serving as the data science methodology expert for the state, as appointed by the Governor of California, by advising departments on ethical, transparent, reproducible, and interpretable practices in data science

Stanford University / Research Scientist

APRIL 2010 - JULY 2021, STANFORD CA

Published [several studies](#) and [presented talks](#) on space weather prediction models using machine learning algorithms and image data taken by NASA satellites that enabled the federal government to protect infrastructure, such as satellites and power grids, and garnered media attention from *The Mercury News* and *Scientific American*

Led two large interdisciplinary teams to develop space weather prediction models using novel machine learning algorithms as PI and Co-I of NSF and NASA grants (\$1.8M total award)

Authored a book titled [Machine Learning, Statistics, and Data Mining for Heliophysics](#)

Led the development of open data and open source software as a founding member of the Python in Heliophysics and Machine Learning in Heliophysics organizations and Vice-Chair of the Board for SunPy

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)

Harvard-Smithsonian Center for Astrophysics /

Astrophysicist

OCTOBER 2005 - AUGUST 2007, CAMBRIDGE MA

Developed flight hardware tests, operations, and software for the JAXA/NASA Hinode satellite, and developed a numerical model of solar flares that accurately reproduces observations from the satellite