

Katharine K. Reeves

SENIOR ASTROPHYSICIST, CENTER FOR ASTROPHYSICS | HARVARD & SMITHSONIAN

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History of Employment

Solar and Stellar X-ray Group, Center for Astrophysics | Harvard & Smithsonian

Cambridge, MA

RESEARCH SCIENTIST

June 2006 - Present

- Perform scientific research focusing on energy transfer in solar flares and coronal mass ejections
- Author of over 90 refereed publications, including 14 first author publications
- Supervise research projects performed by students, post-docs, and SSXG's support scientists

PROJECT SCIENTIST FOR THE X-RAY TELESCOPE (XRT) ON THE HINODE MISSION

May 2008-Present

- Manage and train an international team of personnel involved in XRT operations
- Ensure data quality and availability by supervising calibration, catalog, and data pipeline efforts
- Develop XRT observing programs for other scientists to meet specific scientific goals
- Organize annual XRT Team Meetings to discuss calibrations, data pipelines, and operations.

DIRECTOR, SAO SOLAR PHYSICS RESEARCH EXPERIENCES FOR UNDERGRADUATES (REU) PROGRAM

September 2010 - Present

- Ensure key program elements are completed, including advertising, student selection, scheduling tutorials and talks, mentor training, and program evaluation
- Develop strategies for recruiting underrepresented students, maintained a 50/50 ratio of female students, increased minority student representation

UNH Solar and Terrestrial Theory Group

Durham, NH

GRADUATE RESEARCH ASSISTANT

September 2002 - May 2006

- Developed a model of flare loop heating based on the energy release in a model of coronal mass ejections, compared the results of the model to observational data.

Solar and Stellar X-ray Group, Harvard-Smithsonian Center for Astrophysics

Cambridge, MA

SUPPORT SCIENTIST

June 1999 - August 2002

- Analyzed data from the Transition Region and Coronal Explorer (TRACE) telescope, participated in the implementation and planning of operations for TRACE, assisted in the design and testing processes for the X-Ray Telescope on the Hinode satellite.

Degrees

University of New Hampshire

Durham, NH

PHD, PHYSICS

May 2006

- Recipient of a New Hampshire Space Grant Consortium Graduate Fellowship, Fall 2002
- Dissertation title: "Linking Solar Flare Radiation to the Dynamics of Coronal Mass Ejections"

Northeastern University

Boston, MA

M.S., PHYSICS WITH A CONCENTRATION IN OPTICS

May 1999

- Recipient of a National Science Foundation Pre-Doctoral Fellowship, Fall 1997

Reed College

Portland, OR

B.A., PHYSICS

May 1996

- Graduated Phi Beta Kappa

Narrative of Research Experience

My research focuses on two main, interconnected topics: thermal energy transport during solar eruptions, and the solar flare reconnection process. To investigate these topics, I use a combination of numerical MHD modeling and analysis of data from various solar observatories. As part of the quest to understand the thermal energy transfer in solar flares, I have developed data analysis projects that study the thermal structure of hot plasma above flare arcades and simulation projects that recreate coronal mass ejections with the goal of understanding the energy transport and plasma heating in solar eruptions. Reconnection studies include analysis of high-resolution, high-cadence spectra of flare loops and MHD simulations of the reconnection region.

Key Publications

- Shen, C.; Chen, B.; **Reeves, K. K.**; Yu, S.; Polito, V.; Xie, X., “The Origin of Underdense Plasma Downflows Associated with Magnetic Reconnection in Solar Flares”, *Nature Astronomy*, **6**, 317, 2022
- **Reeves, K. K.**; Polito, Vanessa; Chen, Bin; Galan, Giselle; Yu, Sijie; Liu, Wei; Li, Gang, “Hot Plasma Flows and Oscillations in the Loop-top Region During the September 10 2017 X8.2 Solar Flare”, *The Astrophysical Journal*, **905**, 165, 2020.
- Chen, B.; Shen, C.; Gary, D. E.; **Reeves, K. K.**; Fleishman, G. D.; Yu, S.; Guo, F.; Krucker, S.; Lin, J.; Nita, G. M.; Kong, X. “Mapping magnetic field and relativistic electrons along a solar flare current sheet” *Nature Astronomy*, 2005.12757, 2020
- **Reeves, K. K.**; Mikic, Z.; Torok, T.; Linker, J.; Murphy, N. A.; “Exploring Plasma Heating in the Current Sheet Region in a 3-Dimensional Coronal Mass Ejection Simulation,” *The Astrophysical Journal*, **887**, 103, 2019.
- **Reeves, K. K.**, Freed, M., McKenzie, D., Savage, S. “An exploration of heating mechanisms in a supra-arcade plasma sheet formed after a coronal mass ejection”, *The Astrophysical Journal*, Volume **836**, 55, 2017
- **Reeves, K. K.**, McCauley, P. I., Tian, H. “Direct Observations of Magnetic Reconnection Outflow and CME Triggering in a Small Erupting Solar Prominence”, *Astrophysical Journal*, **807**, 7, 2015
- **Reeves, K. K.** and Golub, L. “Atmospheric Imaging Assembly Observations of Hot Flare Plasma”, *Astrophysical Journal Letters*, **727**, L52, 2011
- **Reeves, K. K.**, Linker, J. A., Mikić, Z. and Forbes, T. G. “Current Sheet Energetics, Flare Emissions, and Energy Partition in a Simulated Solar Eruption,” *Astrophysical Journal*, **721**, 1547, 2010
- **Reeves, K. K.**, Seaton, D. B., and Forbes, T. G. “Field Line Shrinkage in Flares Observed by the X-Ray Telescope on Hinode,” *Astrophysical Journal*, **675**, 868, 2008
- **Reeves, K. K.**, Warren, H. P. and Forbes, T. G. “Theoretical Predictions of X-Ray and EUV Flare Emissions Using a Loss-of-Equilibrium Model of Solar Eruptions,” *Astrophysical Journal*, **668**, 1210, 2007
- **Reeves, K. K.** “The Relationship Between Flux Rope Acceleration and Thermal Energy Release in a Model of Eruptive Solar Phenomena,” *Astrophysical Journal*, **644**, 592, 2006
- **Reeves, K. K.**, Forbes, T.G. “Predicted Light Curves for a Model of Solar Eruptions,” *Astrophysical Journal*, **630**, 1133, 2005
- **Reeves, K. K.**, Warren, H. P. “A Model for the Cooling of Post-Flare Loops,” *Astrophysical Journal*, **578**, 590, 2002

Honors & Awards

2017	Group Achievement Honor Award , outstanding commitment to science, operations and management of Hinode	NASA/MSFC
2016	Karen Harvey Prize , early career award for significant contribution to the study of the Sun	AAS/SPD
2016	Exceptional Achievement in Science Team Award , outstanding scientific progress by IRIS	NASA/GSFC
2014	Group Achievement Award , outstanding performance: design, construction, launch of IRIS	NASA/GSFC
2013	Ames Honor Award , to the IRIS Project Mission Group, for group excellence	NASA/Ames
2010	Smithsonian Special Act or Service Award , Excellence in XRT operator training	SAO
2007	Smithsonian Special Act or Service Award , Creating XRT operations software testing plans	SAO
2005	Outstanding Student Paper Award , American Geophysical Union Fall Meeting	AGU

Professional Society Memberships

- Full Member** American Astronomical Society, 2010 - present
- Full Member** American Geophysical Union, 2006 - present