THOMAS E. BERGER
Executive Director, Space Weather Technology, Research, and Education Center
ASEN N433
3775 Discovery Drive
University of Colorado
Boulder, CO 80309
thomas.berger@colorado.edu

Professional Preparation

Project Management Institute	Professional Project Management	P.M.P. 2016
Stanford University	Applied Physics/Astrophysics	Ph.D. 1996
Stanford University	Mechanical/Aerospace Engineering	M.S. 1990
University of California, Berkeley	Engineering Physics	B.S. 1985

Appointments

2017—present	Executive Director, Space Weather Technology, Research, and Education Center, University of Colorado at Boulder.
2014—2015	Working Group Four Lead, White House OSTP Space Weather Operations, Research, and Mitigation task force.
2014—2017	Director, NOAA/NWS Space Weather Prediction Center, Boulder, CO.
2012—2014	Project Scientist, NSF Daniel K. Inouye Solar Telescope, National Solar Observatory, Sacramento Peak Observatory, New Mexico.
1996—2012	Senior Research Scientist, Lockheed Martin Advanced Technology Center, Solar and Astrophysics Laboratory, Palo Alto, California.

Management and Research Experience

Dr. Berger is the founding and Executive Director of the University of Colorado (CU) at Boulder Space Weather Technology, Research, and Education Center (SWx TREC), the nation's first academic center of excellence dedicated to bridging the space weather research and operational forecasting enterprises. In this capacity he interfaces with the University Chancellor's office, the College of Engineering and Applied Sciences, University Institutes and departments, and external industry and FFRDC partners, coordinating a Community-wide approach to space weather research and development. Prior to directing CU's SWx TREC, Dr. Berger was the Director of the NOAA/Space Weather Prediction Center in Boulder, Colorado where he oversaw a federal and contractor workforce of 45 people as a career Federal SES employee, managed a $12M annual budget allocation, and led a multi-agency working group for the White House Office of Science and Technology Policy's Space Weather Operations Research and Mitigation (SWORM) effort. Dr. Berger served as the Project Scientist on the $400M Daniel K. Inouye Solar Telescope project for the National Foundation, overseeing the science project planning and management of science personnel for the National Solar Observatory from 2012—2014. Prior to this he was a Senior Research Scientist at Lockheed Martin in Palo Alto, responsible for leading efforts in solar physics instrument development and deployment. Dr. Berger was the founding Chair of the American Astronomical Society's Solar Physics Division Public Policy Committee, organizing two Congressional advocacy visits to Capitol Hill in 2012 and 2013. He has served on numerous NASA and NSF committees and panels including the NASA Mission Operations Working Group (MOWG) and numerous proposal review panels and is a member of the American Geophysical Union Geospace division Nominations Task Force.

Dr. Berger's scientific research focuses on the observation and analysis of solar magnetic structures, from the smallest observable magnetic elements to the plasma instabilities in large-scale prominences. Dr. Berger initiated and continues to develop the application of deep learning artificial intelligence systems to the problem of solar eruption prediction at the University of Colorado. He is experienced in the design of complex polarimetric imaging instrumentation for ground- and space-based solar physics research and was involved in instrument develop for, and is a Co-Investigator on, the Focal Plane Package of the Solar Optical Telescope on the Japanese/US/UK *Hinode* solar physics mission. In 2010, Dr. Berger designed and developed the Solc filter instrument for the NASA Interface Region Imaging Spectrograph (IRIS) SMEX mission. He is a primary or co-author on over 200 peer-reviewed publications.

Selected Publications

Deshmukh, V., N. Flyer, K. van der Sande, **T. Berger**, "Decreasing false alarm rates in CNN-based solar flare prediction using SDO/HMI data", *Astrophys. Journ. Supp*., in press.

Deshmukh, V., **T. Berger**, E. Bradley, J. Meiss, "Leveraging the mathematics of shape for solar eruption prediction", *J. Space Weather and Space Clim*., **10**, 13, 2020.

Berger, T. E., M. J. Holzinger, E. K. Sutton, J. P. Thayer, "Flying through uncertainty", *Space Weather Journal*, **18**, 2020.

Berger, T. E., A. Hillier, W. Liu, "Quiescent Prominence Dynamics Observed with the *Hinode* Solar Optical Telescope. II. Prominence Bubble Boundary Layer Characteristics and the Onset of a Coupled Kelvin-Helmholtz Rayleigh-Taylor Instability", *Astrophys. Journ.*, **850**, 60, 2017.

Berger, T. E., "Prominence Fine Structure and Dynamics", IAUS 300 Paris, "Nature of prominences and their role in space weather", *Proceedings of the IAU*, 2013.

Berger, T. E., W. Liu, B. C. Low, "SDO/AIA detection of solar prominence formation in a coronal cavity", *Astrophys. Journ*., **758**, L37, 2012.

Berger, T. E., P. Testa, A. Hillier, P. Boerner, B. C. Low, K. Shibata, C. Schrijver, T. Tarbell, A. Title, "Magneto-thermal convection in solar prominences", *Nature*, **472**, 197, 2011.

Berger, T. E., "The prominence/coronal cavity system: a unified view of magnetic structures in the solar corona", 2011 ATST-EAST Meeting Proceedings, *Astronomical Society of the Pacific*, Vol. 463, 2012.

Berger, T. E., G. Slater, N. Hurlburt, R. Shine, T. Tarbell, A. Title, B. W. Lites, T. J. Okamoto, K. Ichimoto, Y. Katsukawa, T. Magara, Y. Suematsu, T. Shimizu, "Quiescent Prominence Dynamics Observed with the *Hinode* Solar Optical Telescope. I. Turbulent Upflow Plumes", *Astrophys. Journ.*, **716**, 1288, 2010.

Hillier, A., H. Isobe, K. Shibata, **T. Berger**, "Numerical Simulations of the Magnetic Rayleigh-Taylor Instability in the Kippenhahn-Schlüter Prominence Model. II. Reconnection Triggered Downflows", *Astrophys. Journ.*, **756**, 110, 2012.

Liu, W., **T. E. Berger**, B. C. Low, "First *SDO*/AIA Observation of Solar Prominence Formation Following an Eruption: Magnetic Dips and Sustained Condensation and Drainage", *Astrophys*. *Journ*., **745**, L21, 2012.

Low, B. C., **T. E. Berger**, R. Casini, W. Liu, "The Hydromagnetic Interior of a Solar Quiescent Prominence. I. Coupling between force-balance and steady energy-transport", *Astrophys. Journ*., **755**, 34, 2012.