Chris Lowder

CONTACT

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EDUCATION

Montana State University, Bozeman, Montana, United States

PhD Physics, June 2015

M.S. Physics, May 2011

Georgia Institute of Technology, Atlanta, Georgia, United States

B.S., Physics, December 2007

PUBLICATIONS

Lowder, C., Lamb, D., & DeForest, C., *Fluxon Modeling of CMEs and the Steady Solar Wind*. (in preparation).

Lowder, C., Yeates, A., *Magnetic Flux Rope Identification and Characterization from Observationally-Driven Solar Coronal Models.* ApJ, 846, 106 (2017).

Lowder, C., Qiu, J., & Leamon, R. *Coronal Holes and Open Magnetic Flux over Cycles 23 and 24.* SoPh 292, 18 (2017).

Lowder, C., Qiu, J., Leamon, R. & Liu, Y. *Measurements of EUV Coronal Holes and Open Magnetic Flux.* ApJ 783, 142 (2014).

Lowder, C., Qiu, J., Leamon, R., & Longcope, D. *Connecting Coronal Holes and Open Magnetic Field*. (in preparation).

Lowder, C., Qiu, J., & Leamon, R., *Transient Coronal Dimmings and connection to Heliospheric Open Flux*. (in preparation).

SELECTED CONFERENCE PROCEEDINGS

Open Magnetic Flux and Coronal Holes: Probing the Polar Regions Polar Perspectives Workshop (2018).

Magnetic Flux Rope Identification and Characterization from Observationally-Driven Solar Coronal Models UK National Astronomy Meeting (2016 / 2017).

Connecting Coronal Holes and Open Magnetic Field via Numerical Modeling and Observations. Triennial Earth-Sun Summit / SPD (2015).

A Comparison of EUV Coronal Hole Measurements and Modeled Open Magnetic Field -or- How I learned to stop worrying and love the potential magnetic field. GSU Colloquium Series (2014).

Full Surface Automated Coronal Hole Detection and Characterization to Constrain Global Magnetic Field Models. AAS Meeting 220 (2012).

Transient coronal holes : A statistical study of coronal dimming regions. The Origin, Evolution, and Diagnosis of Solar Flare Magnetic Fields and Plasmas (2010).

Coronal Mass Ejections : A Study of Structural Evolution and Classification. AAS Meeting 210 (2007).

COMPUTING

Proficient : Python, NumPy, SciPy, SunPy, MayaVi, IDL, SolarSoft, LaTeX, OpenMPI, Fortran, Git/GitHub

Familiar : Perl, PDL, C++, Octave, MATLAB, OpenCL, VisIt, Glue, Pandas

Experience in parallel high performance computing projects and large-scale datasets

Research Experience

Southwest Research Institute
Planetary Science Directorate
Department of Space Studies Boulder, Colorado, United States

Research Scientist **December 2017 to Present**

- Working with Craig DeForest and Derek Lamb on Fluxon MHD modeling of the solar corona.
- Assisting with integration of codes through the Fluxon Rapid Assimilative Nowcaster (FRAN).

Durham University
Department of Mathematical Sciences Durham, United Kingdom

Postdoctoral Research Associate **August 2015 to September 2017**

- Working with Anthony Yeates on modeling solar flux rope eruption.
- Developed the Flux Rope Detection and Observation (FRoDO) code for automated tracking of magnetic flux ropes.
- Utilized global non-potential models of the solar magnetic field, to identify and characterize magnetic flux ropes throughout the span of the solar activity cycle.
- Developed software routines for managing and visualizing large datasets.
- Organized UKMHD 2017 meeting in Durham.

Montana State University
School of Physics Bozeman, Montana, United States

Graduate Research Assistant **August 2009 to August 2015**

- Worked with Dr. Jiong Qiu and Dr. Robert Leamon in analyzing coronal dimming
- Designed automated code to detect and characterize coronal holes from SDO and STEREO EUV data to constrain global models of open magnetic field
- Developed flux transport model to study evolution of far-side open magnetic field
- Designed and supervised two projects for undergraduate research students as a part of the MSU solar REU program

Montana State University
Solar Physics Group Bozeman, Montana, United States

NSF Summer REU Undergraduate Researcher **June 2007 to August 2007**

- Improved methods to resolve the 180-degree ambiguity in solar vector magnetograms
- Attempted to apply method to high resolution Hinode magnetograms

University of Hawaii
Institute for Astronomy Honolulu, Hawaii, United States

NSF Summer REU Undergraduate Researcher **May 2006 to August 2006**

- Analysis of CMEs utilizing SOHO data for Dr. Shadia Habbal and Dr. Huw Morgan
- Observational experience and interaction with astronomers at Mauna Kea observatories on the IRTF, Caltech CSO, and the UH 88"

Teaching Experience

Georgia Institute of Technology
School of Physics Atlanta, Georgia, United States

Physics I / II Graduate Teaching Assistant **August 2008 to May 2009**

- Designed and marked problem sets covering mechanics and electromagnetism
- Engaged students in problem solving methods not directly addressed in lecture

Georgia Southern University
Department of Physics Statesboro, Georgia, United States

Physics I / II Lab Teaching Assistant **May 2008 to July 2008**

- Maintained lab equipment and helped to integrate the lecture and lab experience
- Graded work assignments and assisted with in-class assignments

Astronomy Laboratory Instructor **January 2008 to May 2008**

- Engaged students in aspects of theory and observations in astronomy
- Modernized course content and implemented new observational activities

Planetarium Lecturer **January 2008 to May 2008**

- Provided free planetarium shows to grade school level groups
- Organized workshop sessions to train grade-school earth science teachers

Georgia Institute of Technology
School of Physics Atlanta, Georgia, United States

Physics II Laboratory Teaching Assistant **September 2007 to December 2007**

- Setup and conducted a physics II lab session
- Instructed students and graded the resulting labwork

Professional Memberships

American Astronomical Society (AAS)
Solar Physics Division (SPD)

Honors

Living with a Star Heliophysics Summer School (Summer 2015)
Triennial Earth-Sun Summit Student Travel Grant (2015)
Living with a Star Portland Meeting - Best Student Poster (2014)
SPD Studentship Travel Award (2012)
National Merit Scholar (2004)
Georgia Governor's Scholar (2002)
Georgia Institute of Technology

- Faculty Honors (Fall 2004, Spring and Fall 2006)
- Dean's List (Spring and Fall 2005)

Outreach

Durham University School Science Festival - Organizing activity on solar magnetism
Peaks and Potentials - Taught summer student workshop series on solar physics
MSU Astronomy Day - Organized solar physics exhibit
Montana Science Olympiad - Designed state astronomy event
Georgia Southern Planetarium - Created and presented planetarium show content