

## Chris Lowder

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CONTACT	Southwest Research Institute 1050 Walnut Street Boulder, Colorado 80302, United States	<i>Office:</i> +1 303 226 5911 <i>Mobile:</i> +1 720 808 2847 <i>E-mail:</i> lowder@boulder.swri.edu
EDUCATION	<b>Montana State University</b> , Bozeman, Montana, United States  PhD Physics, June 2015 M.S. Physics, May 2011  <b>Georgia Institute of Technology</b> , Atlanta, Georgia, United States  B.S., Physics, December 2007	
PUBLICATIONS	Lowder, C., Yeates, A., <i>Magnetic Flux Rope Identification and Characterization from Observationally-Driven Solar Coronal Models</i> . ApJ, 846, 106 (2017). Lowder, C., Qiu, J., & Leamon, R. <i>Coronal Holes and Open Magnetic Flux over Cycles 23 and 24</i> . SoPh 292, 18 (2017). Lowder, C., Qiu, J., Leamon, R. & Liu, Y. <i>Measurements of EUV Coronal Holes and Open Magnetic Flux</i> . ApJ 783, 142 (2014). Lowder, C., Qiu, J., Leamon, R., & Longcope, D. <i>Connecting Coronal Holes and Open Magnetic Field</i> . (in preparation). Lowder, C., Qiu, J., & Leamon, R., <i>Transient Coronal Dimmings and connection to Heliospheric Open Flux</i> . (in preparation).	
SELECTED CONFERENCE PROCEEDINGS	<i>Magnetic Flux Rope Identification and Characterization from Observationally-Driven Solar Coronal Models</i> UK National Astronomy Meeting (2016 / 2017). <i>Connecting Coronal Holes and Open Magnetic Field via Numerical Modeling and Observations</i> . Triennial Earth-Sun Summit / SPD (2015). <i>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</i> . GSU Colloquium Series (2014). <i>Full Surface Automated Coronal Hole Detection and Characterization to Constrain Global Magnetic Field Models</i> . AAS Meeting 220 (2012). <i>Transient coronal holes : A statistical study of coronal dimming regions</i> . The Origin, Evolution, and Diagnosis of Solar Flare Magnetic Fields and Plasmas (2010). <i>Coronal Mass Ejections : A Study of Structural Evolution and Classification</i> . AAS Meeting 210 (2007).	
COMPUTING	<i>Proficient</i> : Python, NumPy, SciPy, SunPy, MayaVi, IDL, SolarSoft, L <sup>A</sup> T <sub>E</sub> X, OpenMPI, Fortran, Git/GitHub <i>Familiar</i> : Perl, PDL, C++, Octave, MATLAB, OpenCL, VisIt, Glue, Pandas Experience in parallel high performance computing projects and large-scale datasets	
RESEARCH EXPERIENCE	<b>Southwest Research Institute</b> <b>Planetary Science Directorate</b> <b>Department of Space Studies</b>  <i>Research Scientist</i>  • 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).  Boulder, Colorado, United States  <b>December 2017 to Present</b>	

**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 Hawai'i**  
**Institute for Astronomy**

Honolulu, Hawai'i 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

**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