

Dr. Amy Renee Winebarger

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Education

2000 **Ph.D.**, *Physics*, University of Alabama in Huntsville, Huntsville, Alabama. Dissertation: “Energetics of Dynamic Plasma in the Solar Transition Region,” Research Advisor: Dr. Gordon Emslie.

1997 **M.S.**, *Physics*, University of Alabama in Huntsville, Huntsville, Alabama.

1995 **B.S.**, *Physics*, King College, Bristol, Tennessee.

Professional Appointments

2006 – *present* Alabama A&M University, *Assistant Professor*

2001 – 2005 Naval Research Laboratory (George Mason University/Computational Physics, Inc.),
Research Assistant Professor/Scientist

1999 – 2001 Smithsonian Astrophysical Observatory, *Astrophysicist*

Research Interests & Expertise

Solar coronal heating, Solar flare heating, Energy growth and release in coronal mass ejections, Explicit comparison between simulation results and observables, Analysis of spectroscopic and filter data, Development and testing of filter response functions, Hydrodynamic code validation and verification.

Research Grants

Principal Investigator — “CAREER: Investigating Impulsive Heating in the Solar Corona,” NSF CAREER program, \$650,000, 2007–2012.

Principal Investigator for AAMU — “Center for Integrated Space Weather Modeling.” NSF Center, Boston University Lead Institution, \$520,000, 2007–2012.

Co-Investigator — “MRI: Acquisition of a Computer Cluster for Space Weather Modeling,” NSF Major Research Instrumentation program, \$190,707, 2008–2011.

Co-Investigator — “Understanding Rigid Rotation of Coronal Holes by Coupling *Hinode* Observations with MHD Modeling,” NASA’s Sun-Earth Guest Investigator Program, \$366,317, 2008–2011.

Principal Investigator — “Temporal Characteristics of Active Region Heating,” NASA’s Sun Earth Connection Guest Investigator program, \$207,487, 2004–2007.

Co-Investigator — “The Magnetic Topology of Coronal Mass Ejections,” NASA’s Living with a Star program, \$301,938, 2004–2007.

Principal Investigator — “Analysis and Hydrodynamic Modeling of Active Region Loops,” NASA’s Solar and Heliospheric Physics program, \$190,307, 2002–2004.

Honors and Awards

NSF CAREER Grant, 2007-2012.

Alan Berman Publications Award, Space Science Division Winner, Naval Research Laboratory, 2003

Graduate Student Research Program Participant, NASA Headquarters, 1997-1999.

Outstanding Teaching Assistant, American Association of Physics Teachers, 1996.

Outstanding Natural Science Student, King College, Bristol, Tennessee, 1995.

Educational Outreach

Presented talks at National Society of Black Physicist Meetings.

Visited and gave seminars at four Historically Black Colleges or Universities.

Given more than twenty additional seminars at schools, universities, companies, and workshops.

Participated in Upward Bound Program in 2007 by completing research with two high school students.

Professional Service

Serve on the Solar Physics Division Committee of the American Astronomical Society (2007-2009).

Organized Solar Physics Division Women's Lunch (2003-2007).

Member of Scientific Organizing Committee for Loops Workshop III (2007).

Serve on Solar Physics Division Summer School and Logo Subcommittees.

Refereed for Astrophysical Journal, Astronomy and Astrophysics, and Solar Physics.

Panel member for several NASA and NSF proposal reviews panels.

University Service

Served on STEM day committee, chair of Publication sub-committee (2007 and 2008).

From 2006-2008, included 14 undergraduate students in research activities.

Advised 2 M.S. student and 2 Ph.D. students.

Co-leader of Space Weather Weekend when we invite approximately 10 students from minority serving institutions to visit Alabama A&M's campus to hear lectures on Space Physics (2006-2008).

Held workshops at the beginning of each semester for undergraduate and graduate students to learn a specific research skill, such as spectroscopic data analysis, code validation, and IDL programming (2007-2008).

Professional Development

Attended Astronomy 101 Teaching Workshop (Spring, 2007).

Attended New Faculty Workshop (Fall, 2007).

Implemented Just-in-Time Teaching and Peer Instruction in Introductory Physics Courses (Spring, 2008).

Professional Membership

American Astronomical Society (Solar Physics Division)

International Astronomical Union

American Geophysical Union

Refereed Journal Publications

1. Winebarger, A.R., Warren, H.P., and Falconer, D., “Modeling X-ray Loops and EUV “Moss” in an Active Region,” 2008, *Astrophys. J.*, 676, 672.
2. Warren, H.P., Winebarger, A.R., Mariska, J.T., Doschek, G.A., and Hara, H., “Observation and Modeling of Coronal “Moss” With the EUV Imaging Spectrometer on *Hinode*,” 2008, *Astrophys. J.*, 677, 1395.
3. Warren, H.P. and Winebarger, A.R., “Static and Dynamic Modeling of a Solar Active Region I: Soft X-ray Emission,” 2007, *Astrophys. J.*, 666, 1245.
4. Ugarte-Urra, I., Warren, H.P. and Winebarger, A.R., “The Magnetic Topology of Coronal Mass Ejection Sources,” 2007, *Astrophys. J.*, 662, 1293.
5. Aschwanden, M.J., Winebarger, A., Tsiklauri, D., and Peter, H., “The Coronal Heating Paradox,” 2007, *Astrophys. J.*, 659, 1673.
6. Warren, H.P. and Winebarger, A.R., “Hydrostatic Modeling of the Integrated Soft X-Ray and Extreme Ultraviolet Emission in Solar Active Regions,” 2006, *Astrophys. J.*, 645, 711.
7. Ugarte-Urra, I., Winebarger, A.R., and Warren, H.P., “An Investigation into the Variability of Heating in a Solar Active Region,” 2006, *Astrophys. J.*, 643, 1245.
8. Winebarger, A. R. and Warren, H. P., “Cooling Active Region Loops Observed With SXT and *TRACE*,” 2005, *Astrophys. J.*, 626, 543.
9. Winebarger, A. R. and Warren, H. P., “Can *TRACE* Extreme-Ultraviolet Observations of Cooling Coronal Loops Be Used to Determine the Heating Parameters?,” 2004, *Astrophys. J.*, 610, L129.
10. Winebarger, A. R., Warren, H. P., and Mariska, J. T., “Transition Region and Coronal Explorer and Soft X-Ray Telescope Active Region Loop Observations: Comparisons with Static Solutions of the Hydrodynamic Equations,” 2003, *Astrophys. J.*, 587, 439.
11. Winebarger, A. R., Warren, H. P., and Seaton, D. B., “Evolving Active Region Loops Observed With the *Transition Region and Coronal Explorer*: I. Observations,” 2003, *Astrophys. J.*, 593, 1164.
12. Warren, H. P., Winebarger, A. R., and Mariska, J. T., “Evolving Active Region Loops Observed With the *Transition Region and Coronal Explorer*: II. Hydrodynamic Modeling,” 2003, *Astrophys. J.*, 593, 1174.
13. Warren, H. P. and Winebarger A. R., “Density and Temperature Measurements in a Solar Active Region,” 2003, *Astrophys. J.*, 596, L113,

14. Aschwanden, M.J., Schrijver, C.J., Winebarger, A.R., and Warren, H.P. “A New Method to Constrain the Iron Abundance from Cooling Delays in Coronal Loops,” 2003, *Astrophys. J.*, 588, L49.
15. Winebarger, A.R., Warren, H.P., van Ballegooijen, A., DeLuca, E.E., and Golub, L., “Steady Flows Detected in EUV Loops,” 2002, *Astrophys. J.*, 567, L89.
16. Winebarger, A.R., Emslie, A.G., Mariska, J.T., and Warren, H.P., “Energetics of Explosive Events Observed with SUMER,” 2002, *Astrophys. J.*, 565, 1298.
17. Winebarger, A.R., Updike, A.C., and Reeves, K.R., “Correlating Transition Region Explosive Events with Extreme-Ultraviolet Brightenings,” 2002, *Astrophys. J.*, 570, L105.
18. Warren, H.P., Winebarger, A.R., and Hamilton, P.S., “Hydrodynamic Modeling of Active Region Loops,” 2002 *Astrophys. J.*, 579, L41.
19. Winebarger, A.R., DeLuca, E.E, and Golub, L., “Dynamic Mass Flows Above an Active Region Observed with *TRACE*,” 2001, *Astrophys. J.*, 553, L81.
20. Seaton, D.B., Winebarger, A.R., DeLuca, E.E., Golub, L., Reeves, K.K., and Gallagher, P.T., “Active Region Transient Events Observed with *TRACE*,” 2001, *Astrophys. J.*, 563, L173
21. Warren, H.P. and Winebarger, A.R., “Small-scale Structure in the Solar Transition Region,” 2000, *Astrophys. J.*, 535, L63.
22. Winebarger, A.R., Emslie, A.G., Mariska, J.T., and Warren, H.P., “Analyzing the Energetics of Explosive Events Observed by SUMER on *SOHO*,” 1999, *Astrophys. J.*, 526, 471.

Invited Presentations

1. Winebarger, A. R. and Warren, H. P., “Using *Hinode* Data to Explicitly Model Active Regions Cores”, AGU Fall Meeting Abstracts, 2007.
2. Winebarger, A. R., “Energetic Implications of Transient Dynamic Events,” SOHO 13 ‘Waves, Oscillations and Small-Scale Transients Events in the Solar Atmosphere: A Joint View from *SOHO* and *TRACE*’, held 29 September - 3 October 2003 Palma de Mallorca, Balearic Islands, Spain. Compiled by H. Lacoste. ESA SP-547. Noordwijk, the Netherlands: European Space Agency, 223.

Additional Conference Presentations

1. Mulu-Moore, F., Winebarger, A., and Warren, H., “Comparison of One-dimensional Hydrodynamic Codes and Analytical Models for Time- Dependent Heating”, AGU Joint Assembly, 2008.
2. Suessmann, P., Winebarger, A., and Falconer, D., “Correlation of STEREO EUVI Luminosity and Active-Region Non-potentiality”, AGU Joint Assembly, 2008.
3. Lyatskaya, S., Hathaway, D., and Winebarger, A., “A Modified Flux Transport Model for Solar Magnetic Fields”, AGU Joint Assembly, 2008.

4. Warren, H., Winebarger, A. R., and Brooks, D., “Electron Densities in Active Region Loops Observed with *Hinode*/EIS”, AGU Joint Assembly, 2008.
5. Zhang, T., Wu, S., Tan, A. and Winebarger, A., “MHD Simulations and Kinetic Analyses of Solar 3He-Rich Events”, AGU Fall Meeting Abstracts, 2007.
6. Mulu-Moore, F., Winebarger, A., and Warren, H., “Benchmarking 1D Hydrodynamic Codes for Steady State Solutions”, AGU Fall Meeting Abstracts, 2007.
7. Tan, A., Zhang, T., Lyatskaya, S., Winebarger, A., and Ramachandran, R., “Analytical Expressions for Temperature Profiles in Model Atmospheres”, AGU Fall Meeting Abstracts, 2007.
8. Farid, S., Winebarger, A., Oluseyi, H., Sterling, A., and Tan, A., “Analysis of Polar Plumes Observed During March 29, 2006 Total Solar Eclipse”, Bulletin of the American Astronomical Society, 2007, 38, 224-+.
9. Winebarger, A. R. and Mikic, Z., “Can Steady Heating Proportional to Magnetic Field Strength Solve the Coronal Heating Paradox?”, Bulletin of the American Astronomical Society, 2007, 38, 208-+.
10. Warren, H. and Winebarger, A. R., “Static and Dynamic Simulations of a Solar Active Region”, Bulletin of the American Astronomical Society, 2007, 38, 204-+.
11. Mulu, F., Winebarger, A., Ugarte-Urra, I., and Warren, H., “Determining the Chirality Of Filaments Associated with CMEs”, Bulletin of the American Astronomical Society, 2007, 38, 139-+.
12. Winebarger, A. R. and Warren, H. P., “Using X-ray and EUV Active Region Observations to Constrain the Coronal Heating Rate”, Bulletin of the American Astronomical Society, 2006, 38, 245-+.
13. Winebarger, A. R. and Warren, H. P., “Are there two coronal heating mechanisms?”, AGU Spring Meeting Abstracts, 2005.
14. Aschwanden, M. J., Schrijver, C. J., Winebarger, A. R., and Warren, H. P., “A New Method to Constrain the Iron Abundance from Cooling Delays in Coronal Loops”, Bulletin of the American Astronomical Society, 2003, 35, 837-+.
15. Winebarger, A. R., Warren, H. P., and Mariska, J. T. , “Observing the Dynamic Corona: Diagnostics to Determine Coronal Heating”, Bulletin of the American Astronomical Society, 2003, 35, 826-+.
16. Warren, H. P., Winebarger, A. R., and Mariska, J. T., “Evolving Active Region Loops Observed With *TRACE*”, Bulletin of the American Astronomical Society, 2003, 35, 826-+.
17. Klimchuk, J. A., Patsourakos, S., and Winebarger, A. R., “Are All Coronal Loops Heated by Nanoflares?”, Bulletin of the American Astronomical Society, 2003, 35, 825-+.
18. Winebarger, A. R., Mariska, J. T., and Warren, H. P. , “Spectral observations of quiescent EUV loops”, Bulletin of the American Astronomical Society, 2002, 34, 667-+.

19. Seaton, D. B., DeLuca, E. E., Golub, L., Reeves, K. K., Winebarger, A. R., and Gallagher, P. T., “Impulsive Events and Coronal Loop Cooling Observed with *TRACE*”, AGU Fall Meeting Abstracts, 2001.
20. Reeves, K. K., Shoer, J., Deluca, E. E., Winebarger, A. R., Ofman, L., and Davila, J. M., “New Observations of Oscillating Coronal Loops”, AGU Fall Meeting Abstracts, 2001.
21. Boyd, J. F., DeLuca, E. E., Reeves, K. K., and Winebarger, A. R., “Investigation of Non-steady Flow Solutions in the Coronal Heating Problem”, AGU Fall Meeting Abstracts, 2001.
22. Updike, A., Winebarger, A., and Reeves, K., “Solar Explosive Events: Nanoflares and Their Potential to Heat the Solar Corona”, Bulletin of the American Astronomical Society, 2001, 33, 1434-+.
23. Kalkofen, W., Warren, H. P., Winebarger, A. R., vanBallegooijen, A., and Avrett, E. H., “Intensity Fluctuations in the Solar Chromosphere”, AGU Spring Meeting Abstracts, 2001.
24. Winebarger, A. R. and Warren, H. P., “The Temperature and Density Structure of the Quiet Solar Corona”, AGU Spring Meeting Abstracts, 2001.
25. Winebarger, A. R. and Warren, H. P., “The Morphology of the Solar Transition Region and Corona”, Bulletin of the American Astronomical Society, 2000, 32, 811-+.
26. Winebarger, A. R., “Energetics of dynamic plasma in the solar transition region”, University of Alabama in Huntsville, Ph.D. Thesis, 1999.
27. Winebarger, A. R., “Energetics of Transition Region Dynamics Observed by SUMER on *SOHO*”, Bulletin of the American Astronomical Society, 1999, 31, 861-+.
28. Winebarger, A. R., Warren, H. P., Emslie, A. G., and Mariska, J. T., “VDEM Analysis of Transition Region Line Profiles Observed with the SUMER Instrument on *SoHO*”, Bulletin of the American Astronomical Society, 1997, 29, 1320-+.
29. Winebarger, A., Deluca, E. E., and Golub, L., “Simultaneous High Resolution Coronal and Photospheric Observations From NIXT and BBSO”, Bulletin of the American Astronomical Society, 1994, 26, 1464-+.

Courses Taught

Physics for Scientist and Engineers, I (Tipler & Mosca): Spring 2006, Fall 2006, Spring 2007, Fall 2008.

Physics for Scientist and Engineers, II (Tipler & Mosca): Fall 2007.

Modern Physics (Beiser): Fall 2007.

Introduction to Astrophysics (Kaufmann & Freedman): Fall 2007.

Undergraduate Research Opportunity Coordinator: Spring 2007, Fall 2007.

Graduate Space Plasma (Parks): Fall 2006.

Graduate Solar-Terrestrial Physics (Schrijver & Siscoe): Fall 2008.