CURRICULUM VITAE **JAMES A. MILLER**

RESEARCH EXPERTISE

High-energy solar physics; computational physics; quasilinear plasma simulations; Monte Carlo simulations; stochastic differential equations; numerical solution of partial differential equations

EXPERIENCE (since PhD)

Director **Aug 2004 – Present**
Institute for Science Education, The University of Alabama in Huntsville

Department Chair **Jan 2015 – Present &**
Department of Physics, The University of Alabama in Huntsville **Dec 2005 – June 2010**

Faculty **Aug 1994 – Present**
Department of Physics, The University of Alabama in Huntsville

Assistant Professor	1994 – 1997
Associate Professor	1997 – 2000
Professor	2000 – Present

Instructor **Jan 1993 – Aug 1994**
Division of Science and Technology, Howard Community College; Columbia, MD

Research Scientist **April 1990 – Aug 1994**
Universities Space Research Association; Columbia, MD
(at the Laboratory for High-Energy Astrophysics, NASA Goddard Space Flight Center)

Assistant Research Scientist	1990 – 1993
Associate Research Scientist	1993 – 1994

EDUCATION

PhD (Physics) **1990**
The University of Maryland

MS (Physics) **1986**
The University of Maryland

BS (Physics, Summa Cum Laude) **1984**
Gannon University; Erie, PA

AWARDS AND SELECT OTHER POSITIONS

Director, Alabama State Science and Engineering Fair — **April 2015 – Present & 2000 – 2004**

AMSTI Exceptional Service Award — **2015, 2008**
Alabama Department of Education

College of Science Outstanding Faculty Award — **2020**

Dean's Service Award — **2018, 2003**
College of Science, The University of Alabama in Huntsville

Faculty Senate President — **2000 – 2001**
The University of Alabama in Huntsville

PROFESSIONAL SOCIETIES

American Geophysical Union
American Association of Physics Teachers

TEACHING EXPERIENCE

- Conceptual Physics (algebra based)
- Technical Science (algebra based)
- General Physics (calculus based and trigonometry based)
- General Physics Labs – Honors Program (calculus based)
- Senior Thesis and Senior Capstone Research advising
- Electrodynamics (advanced undergraduate and graduate)
- Quantum Mechanics (advanced undergraduate and graduate)
- Quantum Field Theory *(*graduate)
- Particle Physics (graduate)
- Plasma Physics (graduate)
- Solar Physics (graduate)
- First-Year Experience (freshman)
- MS and PhD advising

GRADUATE STUDENTS SUPERVISED

1. Geoff Lenters – PhD, 1999. Dissertation Title: "Electron Acceleration in Impulsive Solar Flares"
2. James Sommer – PhD, 2002. Dissertation Title: "Runaway Electron Acceleration by DC Electric Fields in Impulsive Solar Flares"
3. D. Gregory Chavers – PhD, 2003. Dissertation Title: "Recombination Processes in a Flowing Magnetized Plasma: Application to Ionization Energy Recovery in the Variable Specific Impulse Magnetoplasma Rocket (VASIMR)"
4. Mary Hovater – MS, 2005. Thesis Title: "Micrometeroid and Orbital Debris Impact Testing of Solar Sail Material"

5. James Scott Richardson – MS, 2007. Thesis Title: "The Relative Efficiency of Monte Carlo Methods for Solving the Fokker-Planck Equation"
6. Peter Fimognari – PhD, 2007 (NASA GSRP Awardee). Dissertation Title: "Magnetic Field and Density Measurements of a Plasmoid Formed in a Multi-Turn Conical Theta Pinch Coil"
7. Victoria Coffey – PhD, 2008. Dissertation Title: "Oxygen Ion Heating Rate Within Alfvenic Turbulence in the Cusp Near $1R_E$ Altitude"
8. Nilesh Dhote – MS, 2008. Thesis Title: "Numerical Modeling of Alpha-Particle Deposition in a Field Reversed Configuration"
9. Phillip Bitzer – PhD, 2011. Dissertation Title: "New Revelations on Lightning Initiation and Evolution Using a Newly Developed Array of Wideband Electric Field Sensors"
10. Samer Al-Nussirat – PhD, 2018 (NASA NESSF Awardee). Dissertation Title: "Terrestrial Gamma-Ray Flashes and Electron Acceleration in Thunderstorms"
11. Gwen Hamilton – MS, 2019. Thesis Title: "The Detection of Gravitational Waves"
12. Christopher Helmerich – MS, 2020. Thesis Title: "The High Energy Lightening Emission Network (HELEN) for Balloon-Borne Detection of Terrestrial Gamma Ray Flashes"
13. Samantha Gregory – PhD, in progress
14. Christopher Helmerich – PhD, in progress

SERVICE EXAMPLES

Professional

Graduate Research Fellowship Program Panel Review (Panel Chair) **2011**
National Science Foundation
Graduate Research Fellowship Program Panel Review **2010**
National Science Foundation
Sun Earth Connections SR&T Solar Physics Program Panel Review **2009**
NASA, Office of Space Science
Graduate Research Fellowship Program Panel Review **2009**
National Science Foundation
Graduate Research Fellowship Program Panel Review **2008**
National Science Foundation
Sun Earth Connections SR&T Solar Physics Program Panel Review **2007**
NASA, Office of Space Science
Sun Earth Connections SR&T Solar Physics Program Panel Review **2005**
NASA, Office of Space Science
SMART Defense Scholarship Program Panel Review **2005**
Department of Defense
NDSEGF Defense Scholarship Program Panel Review **2005**
Department of Defense
Graduate Research Fellowship Program Panel Review **2005**
National Science Foundation
Graduate Research Fellowship Program Panel Review **2004**
National Science Foundation
Plasma Transport and Confinement Research Program Panel Review **2003**
National Science Foundation
RHESSI Working Group Leader (Particle Acceleration) **2001 - 2003**
RHESSI International Workshop Series

Sun Earth Connections Guest Investigator Proposal Panel Review **2000**
NASA, Office of Space Science
Sun Earth Connections SR&T Proposal Panel Review **2000**
NASA, Office of Space Science
Sun Earth Connections SR&T Proposal Panel Review **1998**
NASA, Office of Space Science
Compton Gamma-Ray Observatory Cycle 7 Proposal Panel Review **1997**
NASA Goddard Space Flight Center, Compton Observatory Science Support Center
Sun Earth Connections SR&T Proposal Panel Review **1996**
NASA, Office of Space Science
Sun Earth Connections SR&T Proposal Panel Review **1995**
NASA, Office of Space Science
Heliospheric Missions Review (SAMPEX and Ulysses) **1995**
NASA, Office of Space Science
Compton Gamma-Ray Observatory Cycle 5 Proposal Panel Review **1995**
NASA Goddard Space Flight Center, Compton Observatory Science Support Center

State

Alabama Science in Motion Steering Committee **2016 – Present**
Alabama Department of Education
Alabama Science Course of Study Committee **2011 – 2015**
Alabama Department of Education
Client Advisory Group **1995 – 2000**
Alabama Supercomputer Authority

University

Research Mini-grant Proposal Review Committee **1994 – 2004**
College of Science representative
Faculty Senate President **2000 – 2001**

PUBLICATIONS AND PRESENTATIONS

Peer-Reviewed Journal Articles

1. Miller, J. A., and Ramaty, R. 1987, Ion and Relativistic Electron Acceleration by Alfven and Whistler Turbulence in Solar Flares, *Solar Phys*., 113, 195
2. Miller, J. A., and Ramaty, R. 1989, Relativistic Electron Transport and Bremsstrahlung Production in Solar Flares, *Astrophys. J*., 344, 973
3. Ramaty, R., Miller, J. A., Hua, X.-M., and Lingenfelter, R. E. 1990, Ion and Relativistic Electron Transport in Solar Flares, *Astrophys. J. Suppl., 73,* 199
4. Miller, J. A., Guessoum, N., and Ramaty, R. 1990, Stochastic Fermi Acceleration in Solar Flares, *Astrophys. J., 361,* 701
5. Miller, J. A. 1991, MHD Turbulence Dissipation and Stochastic Proton Acceleration in Solar Flares, *Astrophys. J., 376,* 342
6. Steinacker, J., and Miller, J. A. 1992, Stochastic Gyroresonant Electron Acceleration in a Low-Beta Plasma: I. Interaction with Parallel Transverse Cold Plasma Waves, *Astrophys. J., 393,* 764
7. Miller, J. A., and Steinacker, J. 1992, Stochastic Gyroresonant Electron Acceleration in a Low-Beta Plasma: II. Implications of Thermal Effects in a Solar Flare Plasma, *Astrophys. J., 399,* 284
8. Miller, J. A., and Vinas, A. F. 1993, Ion Acceleration and Abundance Enhancements by Electron Beam Instabilities in Impulsive Solar Flares, *Astrophys. J., 412,* 386
9. Smith, D. F., and Miller, J. A. 1995, Alfven Turbulence Dissipation in Proton Injection and Acceleration in Solar Flares, *Astrophys. J., 446,* 390
10. Miller, J. A., and Dermer, C. D. 1995, Abundance Enhancements in Black-Hole Accretion: Application to Gamma-Ray Line Observations of the Orion Complex, *Astron. Astrophys., 298,* L13
11. Miller, J. A., and Roberts, D. A. 1995, Stochastic Proton Acceleration by Cascading Alfven Waves in Impulsive Solar Flares, *Astrophys. J., 452,* 912
12. Miller, J. A. 1995, Much Ado About Nothing? *Eos Trans. of the AGU, 76,* 401 (Invited)
13. Dermer, C. D., Miller, J. A., and Li, H. 1996, Stochastic Particle Acceleration Near Accreting Black Holes, *Astrophys. J., 456,* 106
14. Miller, J. A., LaRosa, T. N., and Moore, R. L. 1996, Stochastic Electron Acceleration by Cascading Fast Mode Waves in Impulsive Solar Flares, *Astrophys. J., 461,* 445
15. LaRosa, T. N., Moore, R. L., Miller, J. A., and Shore, S. N. 1996, New Promise for Electron Bulk Energization in Solar Flares: Preferential Fermi Acceleration of Electrons over Protons in Reconnection-Driven MHD Turbulence, *Astrophys. J., 467,* 454
16. Li, H., and Miller, J. A. 1997, Electron Acceleration and the Production of Nonthermal Electron Distributions in Accretion Disk Coronae, *Astrophys. J., 478,* L67
17. Miller, J. A., Cargill, P. J., Emslie, A. G., Holman, G. D., Dennis, B. R., LaRosa, T. N., Winglee, R. M., Benka, S. G., and Tsuneta, S. 1997, Critical Issues for Particle Acceleration in Impulsive Solar Flares, *J. Geophys. Res., 102,* 14631 (Invited Review)
18. Miller, J. A. 1997, Electron Acceleration in Solar Flares by Fast Mode Waves: Quasilinear Theory and Pitch-Angle Scattering, *Astrophys. J., 491,* 939
19. Schlickeiser, R., and Miller, J. A. 1998, Quasilinear Theory of Cosmic Ray Transport and Acceleration: The Role of Oblique MHD Waves and Transit-Time Damping, *Astrophys. J., 492,* 352
20. Lenters, G. T., and Miller, J. A. 1998, Electron Acceleration in Solar Flares by Fast-Mode Waves: Coulomb Collisions, *Astrophys. J., 493,* 451
21. Roberts, D. A., and Miller, J. A. 1998, Generation of Nonthermal Electron Distributions by Turbulent Waves near the Sun, *Geophys. Res. Lett., 25,* 607
22. Miller, J. A. 1998, Particle Acceleration in Impulsive Solar Flares, *Sp. Sci. Rev., 86,* Issue 1-2, 79 (Invited Review)

23. Lenters, G. T., Miller, J. A., and Sommer, J. C. 2000, A Heuristic Coulomb Collision Operator for Cylindrical Velocity Coordinates, Astrophys. J., 534, 997
24. Emslie, A. G., Miller, J. A., Vogt, E., Henoux, J.-C., and Sahal-Brechot, S. 2000, Observations of H-alpha Polarization During a Solar Flare: Global Energetics and Implications for Particle Acceleration, *Astrophys. J.*, *542,* 513
25. Mason, G. M., Wiedenbeck, M. E., Miller, J. A., Mazur, J. E., Cohen, C., Cummings, A. C., Dwyer, J. R., Gold, R. E., Krimigis, S. M., Leske, R. A., Mewaldt, R. A., Slocum, P. L., Stone, E. C., and von Rosenvinge, T. T. 2002, Spectral Properties of He and Other Heavy Ions in He-3 Rich Solar Flares, *Astrophys. J., 574,* 1039
26. Emslie, A. G., Miller, J. A., and Brown, J. C. 2004, An Explanation for the Different Locations of Electron and Ion Acceleration in Solar Flares, *Astrophys. J., 602,* L69
27. Tao, X., Chan, A. A., Albert, J. M. and Miller, J. A. 2008, Stochastic Modeling of Multidimensional Diffusion in the Radiation Belts, *J. Geophys. Res.*, *113*, A07212, doi:10.1029/2007JA012985
28. Miller, J. A. 2018, Solving the Fokker-Planck and Diffusion Equations with Spectral Collocation, *Astrophys. J.*, in preparation

Chapters in Books

1. Vestrand, W. T., and Miller, J. A. 1998, Particle Acceleration During Solar Flares, in *The Many Faces of the Sun: A Summary of the Results From NASA's Solar Maximum Mission*, ed. K. Strong et al. (New York Springer-Verlag), ISBN 038798481X
2. Emslie, A. G., and Miller, J. A. 2003, Particle Acceleration, in *Dynamic Sun,* ed. B. Dwivedi (Cambridge: Cambridge Univ. Press), ISBN 0521810574

Peer-Reviewed Conference Papers

1. Miller, J. A. 2002, Heavy Ion Acceleration in Solar Flares, in *Multi-Wavelength Observations of Coronal Structure and Dynamics* (COSPAR Colloquia Series Vol. 13), eds. P. C. H. Martens and D. Cauffman (Amsterdam: Pergamon Press), p. 387

Editorially-Reviewed Conference Papers

1. Ramaty, R., Miller, J. A., Hua, X.-M., and Lingenfelter, R. E. 1988, Models of Gamma-Ray Production in Solar Flares, in *Nuclear Spectroscopy of Astrophysical Objects*, eds. N. Gehrels and G. H. Share (New York: AIP), p. 217 (for invited talk; presented by R. Ramaty)
2. Ramaty, R., Murphy, R. J., and Miller, J. A. 1990, Solar Accelerated Particles: Comparisons of Abundances and Energy Spectra from Particle and Gamma-Ray Observations, in *Particle Astrophysics*, eds. V. Jones, J. Ormes, and F. Kerr (New York: AIP), p. 143 (for invited talk; presented by R. Ramaty)
3. Miller, J. A., and Ramaty, R. 1992, Stochastic Acceleration in Impulsive Flares, in *Particle Acceleration in Cosmic Plasmas*, eds. G. P. Zank and T. K. Gaisser (New York: AIP), p. 223 (for invited talk; presented by J. Miller)
4. Steinacker, J., and Miller, J. A. 1992, Proton Gyroresonance with Parallel Waves in a Low-Beta Solar Flare Plasma, in *Particle Acceleration in Cosmic Plasmas*, eds. G. P. Zank and T. K. Gaisser (New York: AIP), p. 235 (for contributed talk; presented by J. Steinacker)
5. Lenters, G. T., and Miller, J. A. 1996, Charged Particle Diffusive Transport, in *High Energy Solar Physics*, eds. R. Ramaty, N. Mandzhavidze, and X.-M. Hua (New York: AIP), p. 505 (for contributed talk; presented by G. Lenters)
6. Miller, J. A., and Reames, D. V. 1996, Heavy Ion Acceleration by Cascading Alfven Waves in Impulsive Solar Flares, in *High Energy Solar Physics,* eds. R. Ramaty, N. Mandzhavidze, and X.-M. Hua (New York: AIP), p. 450 (for invited talk; presented by J. Miller)

7. Miller, J. A. 1999, Particle Acceleration in Solar Flares, in *Highly Energetic Physical Processes and Mechanisms for Emission from Astrophysical Plasmas,* eds. P. C. H. Martens, S. Tsuruta, and M. A. Weber (Paris: IAU), Vol. 195, p. 277 (for invited talk; presented by J. Miller)
8. Miller, J. A. 2000, Stochastic Particle Acceleration in Solar Flares, in *High Energy Solar Physics: Anticipating HESSI,* eds. R. Ramaty and N. Mandzhavidze (Astro. Soc. Pacific Conf. Series), Vol. 206, p. 145 (for invited talk; presented by J. Miller)
9. Ramaty, R., Lenters, G. T., Mandzhavidze, N., and Miller, J. A. 2000, Gamma Ray Evidence for Time-Dependent Heavy Ion Enhancement in a Solar Flare, in *Acceleration and Transport of Energetic Particles Observed in the Heliosphere,* ed. R. A. Mewaldt et al. (New York: AIP), 119 (for contributed talk; presented by R. Ramaty)

Other Conference Papers

1. Miller, J. A., Ramaty, R., and Murphy, R. J. 1987, Stochastic Acceleration in the Transrelativistic Regime and Pion Production in Solar Flares, in *Proc. 20th Internat. Cosmic Ray Conf. (Moscow), 3,* 33 (for contributed talk; presented by R. Ramaty)
2. Miller, J. A., Ramaty, R., and Guessoum, N. 1990, Ion Acceleration by Alfven Turbulence in Solar Flares, in *Proc. 21st Internat. Cosmic Ray Conf. (Adelaide), 5,* 36 (for contributed talk; presented by J. Miller)
3. Miller, J. A., Vinas, A. F., and Reames, D. V. 1993, Selective He-3 and Fe Acceleration in Impulsive Solar Flares, in *Proc. 23rd Internat. Cosmic Ray Conf. (Calgary), 3,* 13 (for contributed talk; presented by J. Miller)
4. Miller, J. A., Vinas, A. F., and Reames, D. V. 1993, Heavy Ion Acceleration and Abundance Enhancements in Impulsive Solar Flares, in *Proc. 23rd Internat. Cosmic Ray Conf. (Calgary), 3,* 17 (for contributed talk; presented by J. Miller)
5. Miller, J. A., and Reames, D. V. 1997, Cascading Alfven Wave Acceleration in Solar Flares, in *Proc. 25th Internat. Cosmic Ray Conf. (Durban), 1,* 141 (for contributed talk; presented by J. Miller)
6. Miller, J. A., and Roberts, D. A. 1997, Electron Acceleration in Impulsive Solar Flares, in *Proc. 25th Internat. Cosmic Ray Conf. (Durban), 1,* 145 (for contributed talk; presented by J. Miller)
7. Schlickeiser, R., and Miller, J. A. 1997, On the Mean Free Path Discrepancy of Solar Cosmic Rays, in *Proc. 25th Internat. Cosmic Ray Conf. (Durban), 1,* 237 (for contributed talk; presented by J. Miller)

Published Abstracts of Presentations (Invited)

1. “Heavy Ion Acceleration in Solar Flares”, Miller, J. A., AGU Spring Meeting (Boston, MA: 31 May-4 June 1999)
2. “Particle Acceleration in Solar Flares”, Miller, J. A., IAU Symposium 195 (Bozeman, MT: 6-10 July 1999)
3. "Particle Acceleration in Solar Flares", Miller, J. A., IAU Symposium 219: Stars as Suns-Activity, Evolution, Planets (Sydney, Australia: 21-25 July 2003)
4. “Particle Acceleration in Impulsive Solar Flares”, Miller, J. A., Bulletin of the AAS, Vol. 36, No. 2, p. 736, 204th AAS Meeting (Denver, CO: 30 May – 3 June 2004)
5. “Stochastic Acceleration by Two Novel Wave-Particle Interactions”, Miller, J. A., SHINE Abstract Volume, p. 21, Abstract 30, NSF Solar, Heliospheric, and Interplanetary Environment (SHINE) Workshop (Big Sky, MT: 27 June – 2 July 2004)
6. “Stochastic Acceleration by Novel Wave-Particle Interactions”, Miller, J. A., Bulletin of the APS, Vol. 49, No. 8, p. 181 (46th Annual Meeting of the Division of Plasma Physics) (Savannah, GA: 15-19 November 2004)
7. “Stochastic Acceleration and Atmospheric Response in Solar Flares”, Miller, J. A., SHINE Abstract Volume, p. 27, Abstract No. 39, NSF Solar, Heliospheric, and Interplanetary Environment (SHINE) Workshop (Keauhou, HI: 11-15 July 2005)

8. "Adaptive Runge-Kutta Algorithms for Solving Fokker-Planck Associated Stochastic Differential Equations" (Session MS55) Miller, J. A., 2006 SIAM Annual Meeting (Boston, MA: 10-14 July 2006)
9. "Particle Acceleration in Solar Flares" (Abstract E2.3-0011-06) Miller, J. A., 36th COSPAR Scientific Assembly (Beijing, China: 16-23 July 2006)
10. "Particle Acceleration via 2nd-Order Fermi" Miller, J. A., 7th Annual International Astrophysics Conference ("Particle Acceleration and Transport in the Heliosphere and Beyond") (Kauai, HI: 7-13 March 2008)
11. "Adaptive Algorithms for Solving Fokker-Planck Associated Stochastic Differential Equations" Miller, J. A., Astronum 2008 ("3rd International Conference on Numerical Modeling of Space Plasma Flows") (St. John, USVI: 8-13 June 2008)
12. "Particle Acceleration and Atmospheric Response in Solar Flares" Miller, J. A., Astronum 2010 ("5th International Conference on Numerical Modeling of Space Plasma Flows") (San Diego, CA: 13-18 June 2008)

Published Abstracts of Presentations (Contributed)

1. "Ion Acceleration in Impulsive Solar Flares", Miller, J. A., Roberts, D. A., and Reames, D. V. (presented by J. A. Miller), Meeting of the Solar Physics Division of the AAS (Memphis, TN: 4-8 June 1995)
2. "Electron Acceleration in Impulsive Solar Flares", LaRosa, T. N., Moore, R. L., Miller, J. A., and Shore, S. (presented by J. A. Miller), Meeting of the Solar Physics Division of the AAS (Memphis, TN: 4-8 June 1995)
3. "Alfven Wave Dissipation and Heating", Vinas, A. F., and Miller, J. A. (presented by A. F. Vinas), 1996 Spring AGU Meeting (Baltimore, MD: 20-24 May 1996)
4. "Transit-Time Electron Acceleration", Miller, J. A. (presented by J. A. Miller), 1996 AAS SPD Meeting (Madison, WI: 9-13 June 1996)
5. "Stability of Electron Distributions That Result from Transit-time Damping", Lenters, G. T., and Miller, J. A. (presented by G. Lenters), 1996 AAS SPD Meeting (Madison, WI: 9-13 June 1996)
6. "Electron Acceleration by Electric Fields in Solar Flares", Sommer, J. C., and Miller, J. A. (presented by J. Sommer), 1996 AAS SPD Meeting (Madison, WI: 9-13 June 1996)
7. "Electron Acceleration by Fast Mode Waves in Impulsive Solar Flares", Lenters, G. T., and Miller, J. A. (presented by G. Lenters), Meeting of the Solar Physics Division of the AAS (Bozeman, MT: 27 June-1 July 1997)
8. "A Coulomb Collision Operator for Diffusion Equations in Cylindrical Velocity Space", Lenters, G. T., and Miller, J. A. (presented by G. Lenters), Joint meeting of the Solar Physics Division of the AAS and the AGU (Boston, MA: 26-29 May 1998)
9. "Spatial Distribution of Hard X-ray Emission in Competing Solar Flare Acceleration Models", Emslie, A. G., Sommer, J. C., Lenters, G. T., and Miller, J. A. (presented by A. G. Emslie), Joint meeting of the Solar Physics Division of the AAS and the AGU (Boston, MA: 26-29 May 1998)
10. "Electric Field Acceleration in Solar Flares", Sommers, J. C., and Miller, J. A. (presented by J. A. Miller), Joint meeting of the Solar Physics Division of the AAS and the AGU (Boston, MA: 26-29 May 1998)
11. "Nonthermal Tail Formation in Solar Flares", Miller, J. A. (paper presented by J. A. Miller), Joint meeting of the Solar Physics Division of the AAS and the AGU (Boston, MA: 26-29 May 1998)
12. "Preferential Heavy Ion Acceleration in Impulsive Solar Flares", Miller, J. A. (presented by J. A. Miller), AGU Fall Meeting (San Francisco, CA: 15-19 December 2000)
13. "Loop-Top Hard X-ray Emission from Impulsive Solar Flares", Marsteller, B., Orr, E., and Miller, J. A. (presented by B. Marsteller), AGU Fall Meeting (San Francisco, CA: 15-19 December 2000)
14. "Spatial Dependence of Hard X-ray Emission in Solar Flares", Marsteller, B., Orr, E., and Miller, J. A. (presented by B. Marsteller), AGU Spring Meeting (Boston, MA: 29 May-2 June 2001)
15. "A Unified Model of Particle Acceleration and Atmospheric Response in Solar Flares" (paper SH13A-1149), Miller, J. A., and Mariska, J. T. (presented by J. Miller), AGU Fall Meeting (San Francisco, CA: 13-17 December 2004)

16. "Observed Relationship Between Ion Energization and the Broadband ELF Spectrum" (paper SM23A-0495), Coffey, V. N., Chandler, M. O., Singh, N., and Miller, J. A. (presented by V. Coffey), AGU Fall Meeting (San Francisco, CA: 13-17 December 2004)
17. "Stochastic Particle Acceleration in a Self-Consistent Solar Flare Atmosphere" (paper SP41C-02), Miller, J. A., and Mariska, J. T. (presented by J. Miller), AGU Spring Meeting/AAS SPD Meeting (New Orleans, LA: 23-27 May 2005)
18. "Numerical Solution of the 2-D Momentum Diffusion Equation" (paper SP21A-07), Piscicelli, M. and Miller, J. A. (presented by M. Piscicelli), AGU Spring Meeting/AAS SPD Meeting (New Orleans, LA: 23-27 May 2005) (Outstanding Student Paper Award from the AGU)
19. "An Adaptive Runge-Kutta Algorithm for Solving Fokker-Planck Associated Stochastic Differential Equations" (paper SH33B-0371), Miller, J. A., and Piscicelli, M. (presented by J. Miller), AGU Fall Meeting (San Francisco, CA: 4-9 December 2005)
20. "Modeled and Observed Relationship Between Ion Energization and the Broadband ELF Spectrum" (paper SM51A-1274) Coffey, V. N., Singh, N., Chandler, M. O., and Miller, J. A. (presented by V. N. Coffey), AGU Fall Meeting (San Francisco, CA: 4-9 December 2005)
21. "Electron Acceleration by Stochastic Electric Fields in Thunderstorms: Terrestrial Gamma-Ray Flashes" (paper AE33A-0438) Alnussirat, S., Miller, J. A., Christian, H., Fishman, G. (presented by S. Alnussirat), AGU Fall Meeting (San Francisco, CA: 12-16 December 2016)

Other Presentations – no published abstract or paper (Invited)
(Unless otherwise specified, J. A. Miller was the only author)

1. "Plasma Physics of Transit-Time Acceleration" (1 hour), Weekly Solar Physics Branch Meeting, NASA Marshall Space Flight Center (Huntsville, AL: 19 July 1995)
2. "A Unified Solar Flare Particle Acceleration Model" (10 minutes), High Energy Solar Physics Workshop, NASA Goddard Space Flight Center (Greenbelt, MD: 15-18 August 1995)
3. "Solar Flare Particle Acceleration" (1 hour), Space Physics Seminar, University of California at Berkeley (Berkeley, CA: 19 September 1995)
4. "The Plasma Physics of Solar Flares" (1 hour), Dept. of Physics Seminar, Univ. of Mississippi (Oxford, MS: 16 January 1996)
5. "A Unified Acceleration Model for Solar Flares" (1 hour), Weekly Astrophysics Seminar, Max-Planck-Institut fur Radioastronomie (Bonn, Germany: 7 May 1996)
6. "Particle Simulations of Wave-Particle Interactions" (1 hour), Weekly Space Physics Seminar, Los Alamos National Laboratory (Los Alamos, NM: 11 September 1996)
7. "Particle Acceleration in Solar Flares: Diagnostics and Model Predictions" (40 minutes), *Advanced Composition Explorer* Science Workshop, California Institute of Technology (Pasadena, CA: 7-9 January 1997)
8. "Stochastic Particle Acceleration by Plasma Waves in AGN Jets" (30 minutes), H. Li, J. A. Miller, and S. Colgate (presented by H. Li), Relativistic Jets in AGN (Cracow, Poland: 27-30 May 1997)
9. "A Unified Particle Acceleration Model for Solar Flares" (40 minutes), Energetic Processes on the Sun and in the Heliosphere, Physikzentrum (Bad Honnef, Germany: 18-21 October 1998)
10. "Cascading MHD Turbulence and Particle Acceleration" (1 hour), Weekly SOHO seminar, NASA Goddard Space Flight Center (Greenbelt, MD: 17 December 1998)
11. "Stochastic Acceleration in Solar Flares" (20 minutes), High Energy Solar Physics Workshop, University of Maryland (College Park, MD: 18-20 October 1999)
12. "Stochastic Heavy Ion Acceleration: Comparison to ACE Data" (30 minutes), *Advanced Composition Explorer*: 2000 Symposium (The Acceleration and Transport of Energetic Particles Observed in the Heliosphere) (Indian Wells, CA: 5-8 January 2000)
13. "Impulsive Flare Energetic Particles Near the Sun" (1 hour), Particles Near the Sun: Implications for NASA's Solar Probe Mission (Atlanta, GA: 12-14 March 2000)

14. "High-Energy Solar Physics" (1 hour), Weekly Plasma Physics Seminar, Dept of Physics, University of Maryland (College Park, MD: 25 October 2000)
15. "Particle Acceleration in Solar Flares" (30 minutes), HESSI Solar Physics Meeting (Greenbelt, MD: 11 December 2000)
16. "Vlasov Simulations" (1 hour), Department of Physics Seminar, University of Kentucky (Lexington, KY: 9 November 2002)
17. "Solar Impulsive Events" (45 minutes), ACE/RHESSI/WIND Workshop (Taos, NM: 7-9 October 2003)
18. "Astrophysical Particle Acceleration" (1 hour), Department of Physics Seminar, University of Rochester (Rochester, NY: 26 April 2004)
19. "Particle Acceleration in Solar Flares: A Review" (30 minutes), The Paradoxes of Massive Black Holes: Case Study in the Milky Way (UCSB, CA, Kavli Institute for Theoretical Physics: 14-16 April 2005). Talk published at http://online.kitp.ucsb.edu/online/galactic_c05/miller/

Other Presentations – no published abstract or paper (Contributed)
(Unless otherwise specified, J. A. Miller was the only author)

1. "Solar Flares" (1 hour), Physics Department Colloquium, UAH (Huntsville, AL: 6 December 1994)
2. "Requirements for a High-Energy Solar Flare Mission" (poster), A. G. Emslie and J. A. Miller (presented by both), Second Sun-Earth Connections Workshop (Pasadena, CA, Jet Propulsion Laboratory: 28-30 October 1996)
3. "Electron Acceleration and the Production of Nonthermal Electron Distributions in Accretion Disk Coronae" (poster), H. Li and J. A. Miller (presented by H. Li), 18th Texas Symposium on Relativistic Astrophysics (Chicago, IL: 15-20 December 1996)
4. "A New Finite Differencing Technique for 2-D PDEs" (1 hour), Weekly Solar Physics Branch meeting, NASA Marshall Space Flight Center (Huntsville, AL: 10 December 1997)
5. "The Efficiency of Proton Acceleration by Alfven Waves" (1 hour), Solar Seminar, Observatoire de Paris (Meudon, France: 12 May 1998)
6. "A One-Dimensional Electrostatic Vlasov Simulation" (1 hour), Physics Department Colloquium, UAH (Huntsville, AL: 19 November 2002)
7. "The Doomsday Argument" (1 hour), Physics Department Colloquium, UAH (Huntsville, AL: 9 March 2004)
8. "Arnold Diffusion" (1 hour), Physics Department Colloquium, UAH (Huntsville, AL: 23 November 2004)
9. "An Adaptive Runge-Kutta Algorithm for Solving Fokker-Planck Associated Stochastic Differential Equations" (1 hour), Scientific Colloquium, NSSTC (Huntsville, AL: 26 August 2005)
10. "When Zombies Attack!" (1 hour), PH 110 Frontiers of Science class, UAH (Huntsville, AL: 31 October 2018)

Media (Contributed)
(Unless otherwise specified, J. A. Miller was the only author)

11. "Examples in Special Relativity", GitHub Gists. Numerous special relativity examples and illustrations in Tikz.

AWARDED CONTRACTS AND GRANTS

Science Research

Ion Acceleration and Transport in Solar Flares
$50,000 (PI)
Unsolicited Proposal to NASA Goddard Space Flight Center
10/1994 - 9/1995

Particle Acceleration in Active Galactic Nuclei
$14,200 (Co-I; UAH subcontract amount)
NASA Compton Gamma Ray Observatory GI Program
2/1995 – 1/1996

Ion Acceleration in Solar Flares
$10,000 (PI)
Unsolicited Proposal to NASA Goddard Space Flight Center
5/1995 – 4/1996

Ion Acceleration and Abundance Enhancements in Impulsive Solar Flares
$112,753 (PI)
NASA SR&T Cosmic and Heliospheric Physics Program
4/1995 – 3/1998

Runaway Electrons and Nonlinear Ion Acceleration in Impulsive Solar Flares
$132,807 (PI)
NSF Solar Terrestrial Research Program
2/1995 – 9/1998

The Role of Turbulence in Heliospheric Plasmas
$115,500 (Co-I; UAH subcontract amount)
NASA Space Physics Theory Program
11/1996 – 10/1999

Electron Acceleration in Impulsive Solar Flares
$225,858 (PI)
NASA SR&T Solar Physics Program
5/1996 – 12/1999

Ion Acceleration and Abundance Enhancements in Impulsive Solar Flares
$105,000 (PI)
NASA SR&T Heliospheric and Cosmic Ray Physics Program
5/1998 – 4/2001

Stochastic Particle Acceleration in Impulsive Solar Flares
$365,876 (PI)
NASA SEC Solar Physics Program
4/1999 – 3/2002

Production of Loop-Top Hard X-ray Emission
$148,011 (PI)
NASA SEC Solar Physics Program
10/2000 – 4/2003

Optically Emissive Materials
$50,000 (Co-I)
NASA MSFC (Grant No. NCC8-200)
5/2002 - 8/2005

Ion Acceleration and Spectra in Impulsive Solar Flares
$182,074 (PI)
NASA SEC Solar Physics Program (Grant No. NAG5-12824)
3/2003 – 9/2007

Stochastic Acceleration and Atmospheric Response in Solar Flares
$210,793 (PI)
NASA SEC Guest Investigator Program (Grant No. NAG5-12794)
3/2003 – 2/2005

A Plasmoid Thruster for Electric and Fusion Propulsion
$72,000 (PI)
NASA Graduate Student Fellowship Program (Grant No. NNM04AA01H)
6/2004 – 5/2007

Acquisition of a High-Performance Computing Cluster for Solar and Astrophysics Research
$146,000 (Co-I)
NSF (ATM-Major Research Instrumentation) (Grant No. ATM-0421267)
7/2004 – 6/2005

Production of Energetic Emissions and the Acceleration of Particles in Thunderstorms: Terrestrial Gamma-Ray Flashes
$30,000 (PI)
NASA Earth and Space Science Fellowship (Grant No. NNX16A057H)
9/2016 – 8/2019

Education

Observing and Modeling Shocks in the Solar Wind
$1760 (Co-I; UAH subcontract amount)
NASA Space Physics Education Outreach
11/1996 - 10/1998

Solar Physics Education
$15,000 (PI)
NASA Space Physics Education Outreach
5/1996 – 12/1999

Space Physics and Instrumentation at UAH
$105,000 (Co-I)
NSF Research Experience for Undergraduates (Site)
4/1996 – 9/1999

A Solar Guest Observing Facility
$6,050 (PI)
NASA Education/Public Outreach
4/1999 – 3/2002

Space Physics and Instrumentation at UAH
$135,900 (Co-I)
NSF Research Experience for Undergraduates (Site)
9/1999 – 8/2002

AMSTI Master Site
$4,093,691 (PI)
Alabama Department of Education (Grant No. U200548)
5/2002 – 5/2005

Higher Education Involvement in AMSTI through the Math and Science Partnership
$435,000 (PI)
Alabama Department of Education (Grant No. U500365)
4/2005 – 9/2005

AMSTI Master Site
$2,950,000 (PI)
Alabama Department of Education (Grant No. C6U0123)
10/2005 - 9/2006

AMSTI New Module Training
$297,908 (PI)
Alabama Department of Education (Grant No. U500488)
9/2005 – 4/2006

AMSTI Master Site
$3,400,000 (PI)
Alabama Department of Education (Grant No. U700074)
10/2006 – 9/2007

AMSTI GLOBE Program
$175,243 (PI)
Alabama Department of Education (Grant No. U700113)
10/2006 – 9/2007

Engineering is Elementary
$90,163 (PI)
NASA Marshall Space Flight Center
1/2007 – 12/2007

AMSTI Master Site
$4,312,000 (PI)
Alabama Department of Education
10/2007 – 9/2008

AMSTI Master Site
$4,396,000 (PI) (Prorated from $4,722,000)
Alabama Department of Education (Grant No. U900122)
10/2008 – 9/2009

AMSTI Master Site
$2,661,873 (PI)
Alabama Department of Education (Grant No. U900641)
10/2009 – 9/2010

Content Knowledge Enhancement for Teachers
$280,000 (PI)
DoEd MSP, through Alabama Department of Education (also Grant No. U900641)
10/2009 – 9/2010

Mobile Presentation Technology
$15,000 (PI)
Alabama Public School and College Authority (APSCA) (PSCA Grant No. 1G81)
10/1/09 – 9/30/10

Multimedia Classrooms
$20,000 (PI)
Alabama Public School and College Authority (APSCA) (PSCA Grant No. 3G64)
10/1/10 – 9/30/11

AMSTI Master Site
$3,283,016 (PI)
Alabama Department of Education (Grant No. U000713)
10/2010 – 9/2011

Content Knowledge Enhancement for Teachers
$270,056 (PI)
DoEd MSP, through Alabama Department of Education (also Grant No. U000713)
10/2010 – 9/2011

AMSTI Master Site
$2,459,944 (PI)
Alabama Department of Education (Grant No. U100570)
10/2011 – 9/2012

Content Knowledge Enhancement for Teachers
$270,037 (PI)
DoEd MSP, through Alabama Department of Education
8/2011 – 6/2013

AMSTI Master Site
$2,775,00 (PI)
Alabama Department of Education (Grant No. U300171)
10/2012 – 9/2013

Lead Teacher Enhancement Program
$73,046 (PI)
Alabama Commission on Higher Education (Grant no. Agr Dtd 2/1/14)
10/2013 – 9/2014

AMSTI Master Site
$2,764,000 (PI)
Alabama Department of Education (Grant No. U400091)
10/2013 – 3/2015

AMSTI Master Site
$2,835,000 (PI)
Alabama Department of Education (Grant No. U500094)
10/2014 – 9/2015

Alabama Science in Motion
$232,482 (PI)
Alabama Department of Education (Grant No. U500127)
10/2014 – 9/2015

Lead Teacher Enhancement Program
$35,000 (PI)
Alabama Commission on Higher Education (Grant no. Agr Dtd 1/29/15)
1/2015 – 9/2015

AMSTI Master Site
$2,790,260 (PI)
Alabama Department of Education (Grant No. U600199)
10/2015 – 9/2016

Alabama Science in Motion (ASIM)
$213, 207 (PI)
Alabama Department of Education (Grant No. U600204)
10/2015 – 9/2016

Lead Teacher Enhancement Program
$35,000 (PI)
Alabama Commission on Higher Education (Grant no. UAH 2014-827R)
1/2015 – 6/2016

AMSTI Master Site
$2,690,260 (PI)
Alabama Department of Education (Grant No. U700206)
10/2016 – 9/2017

Alabama Science in Motion (ASIM)
$220,575 (PI)
Alabama Department of Education (Grant No. U700172)
10/2016 – 9/2017

AMSTI Master Site
$2,652,134 (PI)
Alabama Department of Education (Grant No. _____)
10/2017 – 9/2018

Alabama Science in Motion (ASIM)
$222,575 (PI)
Alabama Department of Education (Grant No. U800177)
10/2017 – 9/2018

AMSTI Master Site
$2,502,134 (PI)
Alabama Department of Education (Grant No. U9O0019)
10/2018 – 9/2019

Alabama Science in Motion (ASIM)
$228,345 (PI)
Alabama Department of Education (Grant No. U9O0029)
10/2018 – 9/2019

AMSTI Master Site
$2,723,252 (PI)
Alabama Department of Education (Grant No. U9O0098)
10/2019 – 9/2020

Alabama Science in Motion (ASIM)
$318,397 (PI)
Alabama Department of Education (Grant No. U9O0141)
10/2019 – 9/2020

AMSTI Master Site
$3,047,263 (PI)
Alabama Department of Education (Grant No. 2C075)
10/2020 – 9/2021

Alabama Science in Motion (ASIM)
$235,821 (PI)
Alabama Department of Education (Grant No. 2C118)
10/2020 – 9/2021

Service

Alabama State Science and Engineering Fair
$35,000 -- $45,000 per year (PI)
Various Corporations (e.g., Boeing, Raytheon, Hudson Alpha, Techni-Core)
1/2000 – 12/2004
4/2015 – Present

Other

Hands-On Science Program (HASP)
$20,000 - $30,000 per year (fee for service) (PI)
Local School Districts
2005 – Present (but diminishing due to AMSTI)

Engineering is Elementary (EiE) Regional Hub Site
About $25,000 per year (fee for service) (PI)
Alabama Statewide and Southeastern Regional Support
2015 – 2017

Alabama Math, Science, Technology, and Engineering Consortium (AMSTEC)
$32,000 per year on average (PI)
AMSTEC
2006 – Present

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