DR. JARED CARL WORKMAN

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EDUCATION

2010 Ph.D., Astrophysics

- University of Colorado Boulder, CO

2005 M.S., Astrophysics *3.94 GPA*

- University of Colorado Boulder, CO

2003 B.S., Physics and Mathematics *Summa Cum Laude 3.94 GPA*

- Temple University Philadelphia, PA

2000 B.A., Psychology *Summa Cum Laude 3.96 GPA*

- Temple University Philadelphia, PA

AWARDS

W.W. Smith Scholarship 1998-2000
Murray Greene Award
Presidential Scholars Award 2000 and 2003
Richard Nelson Thomas Award 2010

COMPUTER SKILLS

Operating Systems - Windows, Linux, MacOs
Software Packages - Microsoft Office, Mathematica, Maxwell's 3d Simulator, VAPOR, VISIT
Programming Languages, Extensive Experience - C, IDL, Fortran, (X)HTML/CSS
Programming Languages, Basic Proficiency - JAVA, PHP, MySQL
Programming Languages, Familiarity – OpenMP, MPI
Extensive experience with OpenMP and MPI parallelized MHD & Fluid grid based codes
Extensive Experience with the OSIRIS particle in cell (PIC) code
Extensive experience using supercomputing platforms Teragrid, Columbia, & Nersc
Extensive experience developing application specific scientific software solvers and analysis routines

RESEARCH EXPERIENCE

Summer 2010 – Spring 2011 University of Rochester Rochester, NY

Research Scientist

Working to jointly model the large scale reconnection dynamics and slow shock launching in solar flares using parallel MHD solver while probing the particle dynamics in the shocks using PIC simulations. Adapted PIC code OSIRIS to include a moving wall boundary condition. Adapting the results of the multi-scale simulations to generate sub grid models for fluid codes based on kinetic codes.

Spring 2005 – Spring 2010 JILA - Phil Armitage's Group Boulder, CO

Research Assistant

Simulated accretion disks, Molecular Cloud/Black Hole mergers and Magnetohydrodynamic (MHD) instabilities using numerous Fortran and C based advanced parallel 3-D grid based codes. Studied MHD turbulence and instabilities, variability in accretion disks due to hydrodynamic turbulence and thermal effects, star formation and Bondi Accretion onto black holes. Semi-Analytically modeled the afterglow spectrum in Gamma Ray Bursts incorporating relativistic effects and varying magnetic field topologies. Published in multiple, peer-reviewed journals. Presented several talks to faculty and students. Oversaw the development, implementation and analysis of multiple, concurrent projects.

2004 - 2005 SWRI - Solar Physics Group Boulder, CO

Research Assistant

Modeled the thermal response of satellite hardware using IDL. Developed image filtering/manipulation routines image and data analysis routines to examine sounding rocket solar images.

Summer 2000 Physics Department Temple University

Research Assistant

	Conducted research and performed computer modeling in project to detect a candidate for dark matter. Responsibilities included object modeling using "Maxwell's 3D Simulator" (an AutoCAD like program designed to measure electrical and magnetic field forces), examining naturally occurring radiation output from a steel containment chamber, and information analysis. *1996 - 2003* *Counselors for Management Inc.* *Abington, PA* *Research Assistant* Worked as an independent contractor assisting in government and industry sponsored projects. Projects involved technical assessment of new and emerging products and processes. Responsibilities included database construction, data analysis, and report creation.
PUBLICATIONS & CONFERENCE PROCEEDINGS	**PUBLICATIONS** **"Magnetized Bondi-Hoyle-Lyttleton Accretion in The Galactic Center"**, Jared C. Workman & Brian J. Morsony, In preparation **"Analytical Models of Exoplanetary Atmospheres: Atmospheric Dynamics via the Shallow Water System",** Kevin Heng & Jared Workman, submitted **"'Modeling Increased Metal Production in Galaxy Clusters with Pair-Instability Supernovae'",** Brian Morsony, Caitlin Heath, and Jared Workman, accepted. **"Particle-in-cell simulations of particle energization via shock drift acceleration from low Mach number quasi-perpendicular shocks in solar flares"**, Jaehong Park, Chuang Ren, Jared C. Workman, Eric G. Blackman, ApJ, 765, 147,2013 **"Particle-in-cell simulations of particle energization from low Mach number fast mode shocks"**, Jaehong Park, Jared C. Workman, Eric Blackman, Chuang Ren, and Robert Siller, Volume 19, 6, 2012 **"Simulations Reveal Fast Mode Shocks in Magnetic Reconnection Outflows"**, Jared C. Workman, Eric Blackman, & Chuang Ren, Physics of Plasmas, Volume 18, 9, 2011 **"Jitter radiation, images, spectra, and lightcurves from a relativistic, spherical blastwave"**, Brian C. Morsony, Jared C. Workman, Davide Lazzati, (JILA, U. Colorado), Mikhail V. Medvedev (U. Kansas) MNRAS, Volume 392, pp 1397-1402, 2009 **"Jitter Radiation In Gamma Ray Bursts and their afterglows: Emission and Self Absorption"**, Jared C. Workman, Brian C. Morsony, Davide Lazzati, (JILA, U. Colorado), Mikhail V. Medvedev (U. Kansas) MNRAS, Volume 386, pp. 199-210, 2008 **"Interaction of the magnetorotational instability with hydrodynamic turbulence"**, Jared C. Workman & Philip J. Armitage, The Astrophysical Journal, Volume 685, pp. 406-417, 2008 **"Jitter radiation as a possible mechanism for Gamma-Ray Burst afterglows. Spectra and lightcurves"**, Mikhail V. Medvedev (U. Kansas), Davide Lazzati, Brian C. Morsony, Jared C. Workman (JILA, U. Colorado) The Astrophysical Journal, Volume 666, Issue 1, pp. 339-345, 2007 **CONFERENCE PROCEEDINGS** **"Accounting for Anomalously High Metal Production in Galaxy Clusters",** Morsony, Brian J.; Heath, C.; Workman, J. C., American Astronomical Society, AAS Meeting #221, #226.06

	"PIC Simulations of particle energization From low Mach number fast mode shocks", Jaehong Park, Jared C. Workman, Eric G. Blackman, Chuang Ren, and Robert Siller, 220th Meeting, American Astronomical Society, Anchorage, Alaska, June 10th-14th, 2012 **"The importance of high-mass stars for metal enrichment in galaxy clusters"**, C. A. Heath, B. J. Morsony, and J. C. Workman 220th Meeting, American Astronomical Society, Anchorage, Alaska, June 10th-14th, 2012 **"Fast shocks in magnetic reconnection outflows"**, Jared C. Workman, Eric G. Blackman, and Chuang Ren, Division Plasma Physics, 53rd Annual Meeting, Salt Lake City, November 14th-18th, Utah, 2011 **"PIC simulations of low Mach number perpendicular shocks using the moving wall method and ion shock drift acceleration",** Jaehong Park, Jared C. Workman, Eric G. Blackman, Chuang Ren, and Robert Siller, Division Plasma Physics, 53rd Annual Meeting, Salt Lake City,Utah, November 14th-18th, 2011
TEACHING EXPERIENCE	*Fall 2011 - Present Physical & Environmental Sciences Colorado Mesa University* *Assistant Professor* Professor of physics and astronomy. *Spring 2010 Science Department Front Range Community College* *Adjunct Faculty* Served as primary instructor in for Astronomy 101 – Planets and our Solar System, at Front Range Community College. *2003 – 2010 Astrophysical Department University of Colorado* *Teaching Assistant* Developed review session, exams, and homework assignments. Created a very efficient database driven system to record the grades of hundreds of students from multiple sources. *2001 – 2003 Mathematics Department Temple University* *Adjunct Faculty* Served as primary instructor in introductory mathematics courses at Temple University. Increased the proficiency and taught hundreds of students. *2000 – 2002 Math & Science Resource Center Temple University* *Tutor* Tutored math and physics courses, prepared students for tests and ran final review and recitation sessions.