Adam M. Jacobs

CONTACT INFORMATION

Research Associate
JINA-CEE Postdoctoral Fellow
Department of Physics and Astronomy
Michigan State University
Biomedical and Physical Sciences Building 3255
567 Wilson Road
East Lansing, Michigan 48824 USA

E-mail: ajacobs@pa.msu.edu
WWW: http://www.amjacobs.net

EDUCATION

Stony Brook University August 2016
Stony Brook, NY
Ph.D. in Physics
Thesis: *Low-Mach Number Modeling of Thin Helium Shells on Sub-Chandrasekhar Mass White Dwarfs*
Advisor: Dr. Michael Zingale

Hendrix College May 2009
Conway, AR
B.A. in Physics (with distinction) and Computer Science (with distinction)
summa cum laude

RESEARCH INTERESTS

Nuclear astrophysics: compact objects, nucleosynthesis, reactive convection, stellar evolution, type Ia supernovae, X-ray bursts
Computational astrophysics: 3D multi-physics simulations, computational fluid dynamics, GPU and co-processor programming, high performance computing, low Mach hydrodynamics, nuclear reaction networks

EXPERIENCE

Research Associate, Michigan State University August 2016 to present
Joint Institute for Nuclear Astrophysics - Center for the Evolution of the Elements
Postdoctoral Fellow in Theoretical Nuclear Astrophysics
Supervisors: Edward Brown, Hendrik Schatz
Area of Study: Nuclear and Computational Astrophysics, Type I X-Ray Bursts

Research Assistant, Stony Brook University August 2010 to August 2016
Nuclear Astrophysics Group
Advisor: Dr. Michael Zingale
Area of Study: Nuclear and Computational Astrophysics, Type Ia Supernovae

Session Instructor, Stony Brook University February 2015, 2016
WSE 187 Introduction to Research: Computational Science and Engineering

Teaching Assistant, Stony Brook University August 2009 to May 2010
PHY 277 Computation for Physics and Astronomy

National Undergraduate Fellow, Princeton Plasma Physics Laboratory Summer 2008
The Impact of Correlations on MHD Equilibrium Reconstruction
Advisors: Dr. John Finn (Los Alamos National Lab) and Dr. Lang Lao (General Atomics)
Compute and characterize correlations in magnetic data from the DIII-D tokamak for various discharges. Understanding these correlations can improve least squares reconstruction of MHD equilibrium profiles.

Research Assistant, Hendrix College Winter 2007-2008, Summer 2007, Summer 2006
Investigating Geophysical Phenomena Using a Large Ring Laser
Advisor: Dr. Robert Dunn
Implement a data analysis pipeline in LabVIEW for the analysis of experimental data from a large ring laser gyroscope.

PUBLICATIONS

"Low Mach Number Modeling of Convection in Helium Shells on Sub-Chandrasekhar White Dwarfs II: Bulk Properties of Simple Models," **A. M. Jacobs**, M. Zingale, A. Nonaka, A. S. Almgren, & J. B. Bell, *Astrophysical Journal*, 827, 84 (2016). ADS

In Progress

"OpenACC GPU accelerated microphysics in Maestro and Castro," **A. M. Jacobs**, M. P. Katz, D. Wilcox, M. Zingale, C. M. Malone, O. Hernandez, & W. Zhang, 2017, in prep

"Low Mach Number Modeling of Convection in Helium Shells on Sub-Chandrasekhar White Dwarfs III: Ignition in Simple Models," **A. M. Jacobs**, M. Zingale, A. Nonaka, A. S. Almgren, & J. B. Bell, 2017, in prep for *Astrophysical Journal*

COMPUTATIONAL ALLOCATIONS

INCITE 2017 award on OLCF's Cray XK7 Titan machine, "Approaching Exascale Models of Astrophysical Explosions," M. Zingale (PI), A. S. Almgren, J. B. Bell, A. C. Calder, B. Friesen, R. Hix, **A. M. Jacobs**, D. Kasen, M. P. Katz, E. Lentz, C. M. Malone, B. Messer, A. Mezzacappa, A. Nonaka, T. Papatheodore, S. E. Woosley, & W. Zhang. (2017: 45 Mhr)

INCITE 2015 award on OLCF's Cray XK7 Titan machine, "Approaching Exascale Models of Astrophysical Explosions," M. Zingale (PI), A. S. Almgren, J. B. Bell, A. C. Calder, **A. M. Jacobs**, D. Kasen, M. P. Katz, C. M. Malone, & S. E. Woosley. (2015: 50 Mhr, 2016: 55 Mhr)

PRESENTATIONS

Invited

Advanced Computing Workshop, **A. M. Jacobs**, February 6^{th} 2017, Junior Researchers Workshop, JINA-CEE Frontiers in Nuclear Astrophysics Meeting, National Superconducting Cyclotron Laboratory, East Lansing, Michigan.

"The Explosive Possibilities of Sub-Chandrasekhar Mass White Dwarfs," **A. M. Jacobs**, January 11^{th} 2017, Astronomy & Astrophysics Seminar, Michigan State University, East Lansing, Michigan.

"Little Exploding Dwarfs in the Sky," **A. M. Jacobs**, December 1^{st} 2016, Monash Centre for Astrophysics Seminar, Monash University, Victoria, Australia.

"Little Exploding Dwarfs and Nuclear Astrophysics on Compact Objects," **A. M. Jacobs**, February 25^{th} 2016, JINA Seminar, Michigan State University, East Lansing, Michigan.

Contributed

"OpenACC Case Study: Accelerating Maestro's Reactions," **A. M. Jacobs**, Michael Zingale, Oscar Hernandez, May 24^{th}-26^{th} 2016, OLCF User Meeting, Oak Ridge National Lab, Oak Ridge, Tennessee.

"Bulk Properties and Ignition in Simple Models of Double Detonation Type Ia Progenitors," **A. M. Jacobs**, M. Zingale, A. Almgren, A. Nonaka, J. Bell, June 1^{st} - 5^{th} 2015, Fifty-One Erg – an international workshop on the physics and observations of supernovae and supernova remnants, Raleigh, North Carolina.

"Helium Shells on Sub-Chandrasekhar White Dwarfs: Ignition and Convection," **A. M. Jacobs**, M. Zingale, A. Nonaka, A. Almgren, J. Bell, January 5^{th} 2015, American Astronomical Society's 225^{th} Meeting, Seattle, Washington.

"Low Mach Number Modeling of Double-Detonation Type Ia Ignition," **A. M. Jacobs**, April 11^{th} 2014, Max Planck Institute for Astrophysics' XVII Workshop on Nuclear Astrophysics, Ringberg Castle Conference Site, Germany.

"Low Mach Number Modeling of Convection in Helium Shells on Sub-Chandrasekhar Mass White Dwarfs," **A. M. Jacobs**, M. Zingale, A. Almgren, J. Bell, A. Nonaka, S. Woosley, May 13^{th} - 17^{th} 2013, Fifty-One Erg – an international workshop on the physics and observations of supernovae and supernova remnants, Raleigh, North Carolina.

"The Impact of Correlations on MHD Equilibrium Reconstruction," **A.M. Jacobs**, J.M. Finn, L.L. Lao, E.J. Strait, November 2008, Annual Meeting of the American Physical Society's Division of Plasma Physics, Dallas, Texas.

"Using a Large Ring Laser Gyroscope to Understand the Torsional Components of Near-Field Seismic Events," **A. M. Jacobs**, April 2008, Annual April Meeting of the American Physical Society, St. Louis, Missouri.

"Transformation and Analysis of Data from a Large Ring Laser," **A. M. Jacobs**, R. Dunn, April 2007, Fifteenth Annual Arkansas Space Grant Symposium, Morrilton, Arkansas.

AWARDS & RECOGNITION

Junior Researcher Fellowship, Stony Brook Institute for Advanced Computational Science — Fall 2014 - Summer 2016

Elected Member of Phi Beta Kappa — Spring 2009

Outstanding Undergraduate Poster Award, APS DPP Annual Meeting — Fall 2008

Barry M. Goldwater Honorable Mention — Spring 2008

Outstanding Presentation Award, APS April Meeting — Spring 2008

Hendrix College Dean's List — Fall 2005 - Spring 2008

Barry M. Goldwater Honorable Mention — Spring 2007

Joe G. Robbins Physics Award, Hendrix College — Spring 2007

McHenry-Lane Freshman Mathematics Award, Hendrix College — Spring 2006

Arkansas Governor's Distinguished Scholarship, Arkansas Department of Education — Spring 2005

Robert C. Byrd Scholarship, U.S. Department of Education — Spring 2005

WORKSHOPS & TRAINING PROGRAMS

Joint CNA/JINA-CEE Winter School on Nuclear Astrophysics, Shanghai Jiao Tong University, Shanghai, China, December 12^{th}-17^{rd} 2016.

Oak Ridge National Lab GPU Hackathon: OpenACC, Knoxville Marriott, Knoxville, TN, October 19^{th}-23^{rd} 2015.

Argonne Training Program on Extreme-Scale Computing, Pheasant Run Resort/Argonne National Laboratory, July 28^{th}-August 9^{th} 2013.

XSEDE, PRACE, and RIKEN International Summer School on HPC Challenges in Computational Sciences, New York University, June 23^{rd}-28^{th} 2013.

INT Program INT-11-2b, "Astrophysical Transients: Multi-Messenger Probes of Nuclear Physics," Institute for Nuclear Theory, University of Washington, July 2011.

EDUCATION & PUBLIC OUTREACH

"Nature's Extremes: Magnetars," Astronomy on Tap - Lansing, Lansing, Michigan. — November 15th, 2016

"(Super)Computing the Stars," Stony Brook Astronomy Open Night, Stony Brook, New York. — December 5th, 2014

"Cosmology: Precisely Calculating How Little We Know," Spring 2014
Volunteer Speaker at Greene Correctional Facility, Coxsackie, New York.

Adopt-a-Physicist Mentor, Fall 2012
http://www.adoptaphysicist.org/ Spring 2011

REFERENCES

Ann Almgren
Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley, California 94720
(510) 486-5758
ASAlmgren@lbl.gov

Edward Brown
Department of Physics and Astronomy
Michigan State University
Biomed Phys Sci Bldg
567 Wilson Rd
East Lansing, MI 48824
(517) 884-5620
browned@msu.edu

Alan Calder
Department of Physics & Astronomy
Stony Brook University
Stony Brook, New York 11794-3800
(631) 632-1176
alan.calder@stonybrook.edu

Michael Zingale
Department of Physics & Astronomy
Stony Brook University
Stony Brook, New York 11794-3800
(631) 632-8225
michael.zingale@stonybrook.edu