

Adam M. Jacobs

CONTACT INFORMATION	Research Associate JINA-CEE Postdoctoral Fellow Department of Physics and Astronomy Michigan State University Biomedical and Physical Sciences Building, Rm. 3255 567 Wilson Road East Lansing, Michigan 48824 USA	<i>E-mail:</i> ajacobs@pa.msu.edu <i>WWW:</i> http://www.amjacobs.net
EDUCATION	Stony Brook University Stony Brook, NY Ph.D. in Physics Thesis: <i>Low-Mach Number Modeling of Thin Helium Shells on Sub-Chandrasekhar Mass White Dwarfs</i> Advisor: Dr. Michael Zingale	August 2016
	Hendrix College Conway, AR B.A. in Physics (with distinction) and Computer Science (with distinction) <i>summa cum laude</i>	May 2009
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 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, X-Ray Bursts	August 2016 to present
	Course Module Instructor , Michigan State University CMSE 202: Computational Modeling Tools and Techniques Course Instructor: D. Silvia Lead a team of four in developing and implementing inquiry-based activity introducing computational methods	September 2018
	Lab Rotation Instructor , Michigan State University ISP 209L: Mystery of Physical World Lab Course Instructor: S. Beceiro Novo Collaboratively developed and implemented an inquiry-based activity for a freshman physics lab	September 2017
	Research Assistant , Stony Brook University Nuclear Astrophysics Group Advisor: Dr. Michael Zingale Area of Study: Nuclear and Computational Astrophysics, Type Ia Supernovae	August 2010 to August 2016
	Session Instructor , Stony Brook University WSE 187 Introduction to Research: Computational Science and Engineering	February 2015, 2016

Teaching Assistant, Stony Brook University
PHY 277 Computation for Physics and Astronomy

August 2009 to May 2010

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](#)

“Meeting the Challenges of Modeling Astrophysical Thermonuclear Explosions: Castro, Maestro, and the AMReX Astrophysics Suite,” M. Zingale, A. S. Almgren, M. G. Barrios Sazo, V. E. Beckner, J. B. Bell, B. Friesen, **A. M. Jacobs**, M. P. Katz, C. M. Malone, A. J. Nonaka, D. E. Willcox, & W. Zhang, *Journal of Physics Conference Series - ASTRONUM2017*, submitted. [arXiv/1711.06203](#)

RESEARCH GRANTS

2018-2021 \$81,767 (initial year)
National Science Foundation, “Superbursts: Multi-dimensional Simulations of Deep Carbon Explosions on Neutron Stars,” NSF 1812838, PI: Ed Brown, Co-Author: Adam Jacobs

PROFESSIONAL SERVICE

2019 External Reviewer for NASA’s Astrophysics Theory Program
2018 Reviewer for *Monthly Notices of the Royal Astronomical Society*

COMPUTATIONAL ALLOCATIONS

INCITE 2018 award on OLCF’s Cray XK7 Titan machine, “Approaching Exascale Models of Astrophysical Explosions,” M. Zingale (PI); A. S. Almgren, M. G. Barrios Sazo, J. B. Bell, A. C. Calder, B. Friesen, **A. M. Jacobs**, M. P. Katz, C. M. Malone, A. Nonaka, D. Willcox, & W. Zhang. (2018: 40 Mhr, 2019: TBD)

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

“Cosmic Candles in a Computer,” **A. M. Jacobs**, November 30th 2017, Physics and Astronomy Seminar, Bucknell University, Lewisburg, Pennsylvania.

Advanced Computing Workshop, **A. M. Jacobs**, February 6th 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 11th 2017, Astronomy & Astrophysics Seminar, Michigan State University, East Lansing, Michigan.

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

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

Contributed

“Self-Consistently Exploring X-Ray Burst Reaction Rate Sensitivities,” **A. M. Jacobs**, June 26th-29th 2017, JINA-CEE Workshop: Forging Connections From Nuclei to the Cosmic Web, Michigan State University, East Lansing, Michigan.

“OpenACC Case Study: Accelerating Maestro’s Reactions,” **A. M. Jacobs**, Michael Zingale, Oscar Hernandez, May 24th-26th 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 1st - 5th 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 5th 2015, American Astronomical Society’s 225th Meeting, Seattle, Washington.

“Low Mach Number Modeling of Double-Detonation Type Ia Ignition,” **A. M. Jacobs**, April 11th 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 13th - 17th 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

Brookhaven National Lab GPU Hackathon, Brookhaven National Lab, Upton, NY, June 5th-9th 2017.

Institute for Scientist and Engineer Educators' Professional Development Program 2017.

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

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

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

XSEDE, PRACE, and RIKEN International Summer School on HPC Challenges in Computational Sciences, New York University, June 23rd-28th 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," Volunteer Speaker at Greene Correctional Facility, Coxsackie, New York.	Spring 2014
Adopt-a-Physicist Mentor, http://www.adoptaphysicist.org/	Fall 2012 Spring 2011

REFERENCES

* INDICATES TEACHING
REFERENCES

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