

Dr. MacKenzie Warren
Postdoctoral Research Fellow
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PROFESSIONAL APPOINTMENTS

NSF Astronomy & Astrophysics Postdoctoral Fellow – 2018-Present
North Carolina State University Department of Physics
Michigan State University Department of Physics & Astronomy
Joint Institute for Nuclear Astrophysics — Center for the Evolution of the Elements
Postdoctoral Research Associate, Michigan State University — 2016-18
Department of Physics & Astronomy
Joint Institute for Nuclear Astrophysics — Center for the Evolution of the Elements
Graduate Research Assistant, University of Notre Dame — 2015-16
Department of Physics & Astronomy
Joint Institute for Nuclear Astrophysics — Center for the Evolution of the Elements
Graduate Teaching Assistant, University of Notre Dame — 2011-15
Department of Physics & Astronomy

EDUCATION

University of Notre Dame, Notre Dame, IN — Ph.D. in Physics, 2016
Advisor: Dr. Grant Mathews
Thesis: Neutrinos in core-collapse supernovae
University of Notre Dame, Notre Dame, IN — M.S. in Physics, 2014
Reed College, Portland, OR — B.A. in Physics, 2011

GRANTS & AWARDS

2020,-19,-18 Co-I, Department of Energy INCITE computing allocation (1 million node-hours/year)
2018 National Science Foundation Astronomy & Astrophysics Postdoctoral Fellowship
2016 University of Notre Dame Shaheen Graduate School Award
2015,-13 University of Notre Dame Downes Memorial Professional Development Grant
2015,-14,-13 University of Notre Dame Graduate Student Union Conference Grant
2013 University of Notre Dame Luksic Travel Grant
2013 University of Notre Dame Notebaert Professional Development Travel Grant
2013 National Science Foundation Graduate Research Fellowship Honorable Mention
2012 Department of Energy Office of Science Graduate Fellowship Finalist

PUBLICATIONS

- [1] **M. L. Warren**, S. M. Couch, E. P. O'Connor, and V. Morozova. "Constraining properties of the next nearby core-collapse supernova with multi-messenger signals." Submitted to *Ap.J.* arXiv:1912.03328
- [2] S. M. Couch, **M. L. Warren**, and E. P. O'Connor. "Simulating turbulence-aided neutrino driven core-collapse supernova explosions in one dimension." *Ap.J.*, 890:2, 2020. arXiv:1902.01340
- [3] J. P. Olson, **M. L. Warren**, M. Meixner, G. J. Mathews, N. Q. Lan, and H. E. Dalhed. "Generalized density functional equation of state for astrophysical simulations with 3-body forces and quark gluon plasma." Submitted to *Phys.Rev.C.* arXiv:1612.08992
- [4] G. J. Mathews, **M. L. Warren**, J. Hidaka, and T. Kajino. "Sterile neutrino dark matter and core-collapse supernovae." *Proceedings of the Fourteenth Marcel Grossmann Meeting*, p. 2459-2464, 2016. arXiv:1604.012431
- [5] **M. L. Warren**, M. Meixner, G. J. Mathews, J. Hidaka, and T. Kajino. "Impact of sterile neutrino dark matter in core-collapse supernovae." *IJMPA*, 31:25, 2016. arXiv:1603.05503
- [6] **M. L. Warren**, M. Meixner, G. J. Mathews, J. Hidaka, and T. Kajino. "Sterile neutrino oscillations in core-collapse supernovae." *Phys.Rev.D*, 90:103007, 2014. arXiv:1405.6101

SEMINARS & INVITED TALKS

- [1] *HEP/Theory Seminar*, Duke University, 2020.
- [2] *CITA Seminar*, Canadian Institute for Theoretical Astrophysics, 2020.
- [3] *Particle Astrophysics Seminar*, Fermi National Accelerator Laboratory, 2019.
- [4] *FRIB Theory Seminar*, Michigan State University, 2019.
- [5] *Astronomy Seminar*, McGill University, 2018.
- [6] *Astronomy Colloquium*, University of Michigan, 2018.
- [7] *Astronomy Seminar*, University of Notre Dame, 2018.
- [8] *Astronomy Seminar*, Stockholm University, 2018.
- [9] *Microphysics in Computational Relativistic Astrophysics*, Michigan State University, 2017.
- [10] *Astronomy Seminar*, Michigan State University, 2016.
- [11] *Symposium on Neutron Stars in the Multimessenger Era*, Ohio University, 2016.
- [12] *Triangle Nuclear Theory Seminar*, North Carolina State University, 2015.
- [13] *Astrophysics Seminar*, University of Notre Dame, 2015.
- [14] *Physics Department Seminar*, Reed College, 2014.
- [15] *ICRANet Meeting: Black Holes: the largest energy sources in the universe*, National Academy of Sciences, Armenia, 2014.
- [16] *Supernovae, Gamma-ray bursts, and Induced Gravitational Collapse*, Ecole de Physique, France, 2014.

CONFERENCE PRESENTATIONS

- [1] *236th Meeting of the American Astronomical Society*, virtual meeting, 2020.
- [2] *PAN Neutrino Theory Symposium*, Arlington, VA, 2020.¹
- [2] *Joint Institute for Nuclear Astrophysics Frontiers Meeting*, University of Notre Dame, 2020.¹
- [3] *235th Meeting of the American Astronomical Society*, Honolulu, HI, 2020.
- [4] *NSF Astronomy & Astrophysics Postdoctoral Fellowship Symposium*, Honolulu, HI, 2020.
- [5] *Supernova Neutrinos in the Multimessenger Era*, Laurentian University, 2019.
- [6] *Fifty One Ergs*, North Carolina State University, 2019.
- [7] *Midwest Workshop on Supernovae & Transients*, University of Chicago, 2019.
- [8] *233rd Meeting of the American Astronomical Society*, Seattle, WA, 2019.
- [9] *5th Joint Meeting of the APS Division of Nuclear Physics and the Physical Society of Japan*, Hawaii, 2018.
- [10] *Forging Connections: Nuclei to the Cosmic Web*, Facility for Rare Isotope Beams, 2017.
- [11] *Fifty One Ergs*, Oregon State University, 2017.
- [12] *r-Process Nucleosynthesis: Connecting FRIB with the Cosmos*, Michigan State University, 2016.
- [13] *IceCube Particle Astrophysics Symposium*, University of Wisconsin-Madison, 2015.
- [14] *American Physical Society April Meeting*, Maryland, 2015.
- [15] *Joint Institute for Nuclear Astrophysics Frontiers Meeting*, Michigan State University, 2015.
- [16] *4th Joint Meeting of APS Division of Nuclear Physics & Physical Society of Japan*, Hawaii, 2014.

¹ Cancelled due to Covid19 pandemic.

[17] *III INCAI Workshop: Exploring the Nature of the Evolving Universe*, Pontificia Universidad Catolica de Chile, Chile, 2013.

[18] *222nd American Astronomical Society Meeting*, Indiana, 2013.

[19] *American Physical Society April Meeting*, Colorado, 2013.

[20] *Joint Institute for Nuclear Astrophysics Frontiers Meeting*, Michigan State University, 2012.

SCHOOLS & WORKSHOPS

- 2018 “Software Tools for Simulations in Nuclear Astrophysics,” University of Hull
- 2016 “MESA Summer School,” UC Santa Barbara
- 2015 “TALENT School on Nuclear Physics of Neutron Stars & Supernovae,” Institute for Nuclear Theory, University of Washington
- 2014 “ICRANet School in Armenia: Black Holes,” International Center for Relativistic Astrophysics, Armenia
- 2014 “TALENT School on Nuclear Theory for Astrophysics,” Joint Institute for Nuclear Physics, Michigan State University
- 2013 “National Nuclear Physics Summer School,” Stony Brook University

TEACHING & MENTORING EXPERIENCE

Mentoring Experience

Brandon Barker, REU Student – 2018

Department of Physics, Michigan State University

Project: Equation of state sensitivities of core-collapse supernovae

Theo Cooper, REU Student – 2018

Department of Physics, Michigan State University

Project: Fitting convective parameters for 1D turbulence modeling

Jack Mueller, Honors College Professorial Assistant — 2017-2018

Department of Physics, Michigan State University

Project: Statistical analysis of explosive outcomes for landscape of supernova progenitors

Chris Murdter, Undergraduate Research Assistant — 2016-2017

Department of Physics, Michigan State University

Project: Criterion for runaway shock expansion for neutrino-heated core-collapse supernovae

ISEE Professional Development Program; Lansing, MI — 2017

The program results in about 100 hours spent designing and implementing an inquiry activity in the classroom, including several multi-day workshops on inquiry, assessment, and equity & inclusion in the classroom. Participants are responsible for aiding in the design and teaching of the inquiry activity. I was responsible for addressing aspects of equity & inclusion in the process of designing this teaching activity.

Teaching Practicum, University of Notre Dame; Notre Dame, IN — 2015

Structured teaching experience where three lectures are planned, delivered and observed, and reflected upon.

Lectures given in physics courses for engineering students and physics majors.

Teaching Assistant, University of Notre Dame; Notre Dame, IN — 2011-15

Responsible for grading essays, homework assignments, and exams, holding office hours and help sessions, and assisting in laboratory courses. Assisted in undergraduate general science, introductory physics, and advanced undergraduate and graduate level courses.

“Guest” Lectures, University of Notre Dame; Notre Dame, IN — 2013-15

Planned and delivered lectures in several undergraduate courses.

2015 “Geoengineering as a counter strategy,” Climate Physics

2015 “Multi-physics simulations in astrophysics,” Computational Methods in Physics

2014 “Radiation and the radiation reaction,” Electromagnetic Waves

2013 “Parallel transport and the Riemann tensor,” General Relativity

ACADEMIC SERVICE

- Referee: Astrophysical Journal, Physical Review D, NASA
- 2019- Present Organizer & moderator, Joint Institute for Nuclear Astrophysics – Center for the Evolution of the Elements (JINA-CEE) Online Seminar series
- 2019 “Core-collapse supernovae & neutrinos” lecture, *First Frontiers in Nuclear Astrophysics Summer School*
- 2018-19 Member, *First Frontiers in Nuclear Astrophysics Summer School* Organizing Committee
- 2016-17 Chairperson, 2017 *JINA-CEE Frontiers in Nuclear Astrophysics* Conference Organizing Committee
- 2014,-12 Representative, Department of Physics Graduate Recruitment Committee, University of Notre Dame

EQUITY & INCLUSION

- 2019- Present Mentor, oSTEM Mentorship program
- 2017- Present Member, American Astronomical Society Committee for Sexual-orientation and Gender Minorities in Astronomy
- 2020 “Approaches to equity & inclusion at the department level” workshop, University of Toronto
- 2019 “Building an inclusive department” workshop, Canadian Women in Physics Conference
- 2019 “Effective communication and feedback in mentoring” workshop, Michigan State University Astronomy
- 2019 Panel member, LGBTQ+ identities in physics, APS Conference for Undergraduate Women in Physics, Michigan State University
- 2018-19 Cofounder & organizer, Michigan State University Astronomy Equity & Inclusion Discussion group
- 2018-19 Member, LGBTQ+ Postdoc Committee, NOGLSTP/National Postdoctoral Association
- 2018 “Breaking the binary: rethinking approaches to gender equity in STEM” talk, Conversations on Inclusion & Equity Lecture Series, University of Michigan
- 2018 “Making STEM fields LGBTQIA+ inclusive” talk, Central Michigan University & Albion College
- 2014-15 Quality of Life Chairperson, University of Notre Dame Graduate Student Union
- 2014-15 Member, University of Notre Dame Committee for Sexual Assault Prevention
- 2014-15 Cofounder & Member, Graduate LGBTQ & Ally Student Society, University of Notre Dame
- 2013-15 Member, University Committee for Women Faculty & Students, University of Notre Dame
- 2012-16 Cofounder & Member, Association for Women in Science, University of Notre Dame

PUBLIC OUTREACH

- 2014- Present Team member, Popscope Astronomy Outreach Program
- 2017-18 Speaker, Astronomy on Tap — Lansing:
 “Music in Space”
 “Gay is Good: The life of Frank Kameny, astronomer & activist”
 “The Solar Neutrino Problem”