

Brian W. O'Shea

Department of Computational Mathematics, Science, and Engineering

Department of Physics and Astronomy

Facility for Rare Isotope Beams

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Appointments

- 2023 – Interim Director, MSU [Bioinformatics Core](#)
- 2019 – Director, MSU [Institute for Cyber-Enabled Research](#)
- 2014 – Associate Professor (2014-2019) and full Professor (2019-),
Department of Computational Mathematics, Science, and
Engineering, Department of Physics and Astronomy, and Facility
For Rare Isotope Beams, Michigan State University
- 2008 – 2014 Assistant Professor, Lyman Briggs College and Department of Physics and
Astronomy, Michigan State University
- 2005 – 2008 Director's Postdoctoral Fellow, Theoretical Astrophysics Group and Applied
Physics Division, Los Alamos National Laboratory
- 2005 Graduate Research Assistant, Theoretical Astrophysics Group, Los Alamos
National Laboratory
- 2002 – 2005 Graduate Research Assistant, Center for Astrophysics and Space Sciences,
University of California, San Diego
- 2000 – 2002 Graduate teaching assistant and University of Illinois Graduate Fellow,
Department of Physics, University of Illinois at Urbana-Champaign

Education

- 2005 University of Illinois at Urbana-Champaign, M.S. & PhD, Physics.
Dissertation advisor: Michael L. Norman (UCSD/SDSC)
- 2000 University of Illinois at Urbana-Champaign, B.S., *cum laude*, Engineering
Physics with concentrations in astrophysics and computational physics

Research Interests

Theoretical and computational astrophysics: numerical simulation of galaxies, galaxy clusters, and galaxy/intergalactic medium interaction. Galactic chemical evolution. High-redshift structure formation. Turbulence. Plasma processes. **Computational science:** High performance computing, scientific visualization, open-source software development. Analysis and management of massive datasets. Algorithms for massively parallel and heterogeneous architectures. **Education:** Physics and computational science education, student problem-solving, curriculum reform.

Teaching

CMSE 402, Visualization of Scientific Datasets, Spring 2018, Spring 2022
PHY 905/AST 911, Computational Astrophysics and Astrostatistics, Spring 2017, Fall 2018, Spring 2021, Spring 2023
CMSE 890, Algorithms for Next-Generation Architectures, Fall 2018
CMSE 201, Introduction to Computational Modeling: Spring 2016, Fall 2016
LB 271/273, Introductory Physics, I: Fall 2008, 2009, 2010, 2011, 2012, 2013
LB 272/274, Introductory Physics, II: Spring 2009, 2010, 2012
LB 290, Interdisciplinary BRAID seminar, Spring 2012, Fall 2013
LB 490A, Methods in Computational Science, Spring 2014
LB 492, The Nuclear Age, Spring 2011, Spring 2013
AST-410, Senior thesis research, all semesters Fall 2008-Spring 2014

Publications

121 refereed publications in The Astrophysical Journal, ApJ Supplements, ApJ Letters, Physics of Plasmas, Monthly Notices of the Royal Astronomical Society, Transactions on Parallel and Distributed Computing, Journal of Computational Physics, Parallel Computing, Physical Review E, Nature, and Science. ([13,196 citations](#), [h-index of 59](#), [i10-index of 117 \[on Google Scholar\]](#))
5 refereed education research publications in The Physics Teacher, American Journal of Physics, CBE-Life Science Education, Nature Climate Change, and Transactions of Computing Education
7 refereed computer science conference proceedings
37 conference proceedings, book chapters, and white papers
72 invited seminars and colloquia (since 2008)
43 invited and contributed talks and reviews at conferences, workshops, and summer schools (since 2008)

Awards and Honors

LANL Center for Nonlinear Studies Stanislaw M. Ulam Distinguished Scholar, 2025
MSU STEM Gateway Fellowship, 2016-18
Fellow of the American Physical Society, 2016
MSU Teacher-Scholar Award, 2015
University of Michigan MIRA Faculty Sabbatical Fellowship, 2014-15
Lilly Teaching Fellowship, 2011-12
National Science Foundation Astronomy and Astrophysics Postdoctoral Fellow, 2008
Los Alamos National Laboratory Director's Postdoctoral Fellowship, 2005-2008
University of Illinois Graduate Fellowship, 2000
James Scholar in Engineering, University of Illinois at Urbana-Champaign, 2000
Received the University of Illinois Graduate Teaching Certificate, 2002
Outstanding Teaching Assistant Award, UIUC Physics Department, Fall 1998, Spring 1999, Fall 1999, Spring 2000
On The Incomplete List of TAs Ranked "Excellent" By Their Students, Fall 1998, Spring 1999, Fall 1999, Spring 2000 (Ranked "Exceptional" Spring 1999, Fall 1999, Spring 2000)

Students and postdoctoral researchers mentored

PhD dissertations: Carolyn Peruta (MSU, PhD May 2013), Sam Skillman (CU/Boulder, with Jack Burns; PhD May 2013), Greg Meece (MSU, with Mark Voit; PhD May 2016), Brian Crosby (MSU, PhD July 2016), Forrest Glines (MSU, PhD April 2022), Claire Kopenhafer (MSU, PhD November 2022), Gina Vasey (MSU, PhD July 2025; w/Andrew Christlieb)

Current graduate students: Ian Freeman (MSU, 2023-present), Mackenzie Scott (MSU, 2023-present), Thomas Behling (MSU, 2024-present), Tony Romero (MSU, 2025-present)

Former graduate advisees: Matthew Turk (Stanford, w/Tom Abel; 2007-9), David Ventimiglia (MSU, w/Mark Voit; 2008-10, 2013), Jennifer Jones (MSU, 2009), Marios Chatzikos (U. Virginia; visiting student, 2011-12), Chris Richardson (MSU, FAST fellowship advisor, 2011-13), Tom Finzell (MSU, FAST fellowship advisor, 2013-2014), Jennifer Ranta (2015), Hilary Egan (2013-2015), Austin Edmister (MSU MS in Astrophysics, 2015 – 2017), Jasmin Shin (MSU MS in Physics, 2016-2017), Justin Grace (MSU, 2017-2019), Jared Carlson (MSU MS in CMSE, 2019-2021; w/Sean Couch), Carlos J. Llorente (MSU MS in Astrophysics, 2019-2024)

Undergraduate research students: Nicholas Earl (Astrophysics, 2009-11), Monica Derris (Physics, 2009-11), Chris Heuser (Computer science, 2010-11), Dan Perez (Computer Science, 2011-12), Nathan Butcher (Physics, 2012 – 2014), Hilary Egan (Physics, 2012 – 2013), Ciara Johnson (Astrophysics, 2013-2015), Jacob Kneibel (Astrophysics, w/Dr. Devin Silvia; 2013-2015), Luc Menard (Astrophysics, 2015), Yunxiao “Barry” Jia (Astrophysics, 2015), Alex Kreger (Physics, 2015-2016), Claire Kopenhafer (Physics, 2013-2017), Larissa Kennerley (Astrophysics, 2015-2017), Thomas Bolden (Chemical Physics, 2016-2017), Sarah Clay (Astrophysics, 2016-2018), Austin Gilbert (Physics; Summer 2017 CMSE REU), David Crowe (Computer Science; Summer 2017 CMSE REU), Katie Schram (Astrophysics, 2018), Meghan Davis (Astrophysics, 2018 – 2019), Birkan Cetinkaya (Computational Mathematics, 2018 – 2019), Aurora Cossairt (Physics and Math, CMSE REU; Summer 2019), Sebastian Lacayo (Astrophysics, CMSE REU; Summer 2019), Carleen Markey (Astronomy and Statistics, CMSE REU; Summer 2019), Brendan Boyd (Astrophysics; w/Devin Silvia; 2019 – 2020), Trevor Fush (Astrophysics, 2019 – 2022), Evelyn Fuhrman (Physics and Astrophysics, 2020 – 2021), Keara Hayes (Astrophysics, 2021 – 2024), Lucas Clatterbaugh (Astrophysics, 2022-2023), Zilin Dong (Astrophysics, 2022-2023), Jason Williams (Physics, 2023), Sophie Hodgson (Astrophysics, 2023-2024), Elias Taira (Astrophysics, 2022 – 2024; post-bac student 2024-2025), Jazzmin Partridge (Astrophysics, 2025-present), Ryan McCormick (Physics, 2025-present)

Senior thesis or professorial assistant advisees: Emily Chouinard (2008-9), Nicole Kiriazis (2008-9), Joel Adelsberg (2009-10), Talya Krasnert (2010-11), Jessica Domine (2010-2011), Becca Robinson (w/Dr. Facundo Gomez; 2012-13), Jacob Kneibel (w/Dr. Devin Silvia; 2014-15), Madison Fitzgerald (2015-2016), Madison Harris (2015-2016), Erika Christensen (Computer Science, 2018 – 2019), Chris Lu (Computer Science, 2018 – 2020), Lucas Clatterbaugh (Astrophysics, 2023), Elias Taira (Astrophysics, 2024)

Postdoctoral researchers: Britton Smith (2009-2012), Facundo Gomez (2011-2014), Devin Silvia (2013-2017; NSF AAPF, 2014-2017), Brian Danielak (2015-2017), Benoit Cote (2015-2018; 2020), Philipp Grete (2016-2021), Deovrat Prasad (2018-2022), Benjamin Wibking (2022-present)

Grants awarded

“Galaxy Formation at the Edge: Simulating the Smallest Galaxies to be Explored by Webb and Roman,” PI: Molly Peeples (I am co-PI and MSU Institutional PI). NASA Astrophysics Theory Program. \$286,066. 1/2025-12/2027

“CC* Storage – Campus: The MSU Data Hub: A campus-wide hub for data storage, collaboration, and sharing to enable data-intensive research and education.” PI: Brian O'Shea. National Science Foundation Campus Cyberinfrastructure program grant #2429466. \$629,7900, 12/2024-11/2026

“Center for Hierarchical and Robust Modeling of Non-Equilibrium Transport (CHaRMNET),” PI:

Andrew Christlieb (I am co-PI). Department of Energy Mathematical Multifaceted Integrated Capability Centers (MMICC) program. \$4,925,000, 9/2022 – 8/2027

“NRT-AI-HDR: Harnessing the data revolution (HDR) to enable predictive multi-scale modeling across STEM,” PI: Daniel Appelö (I am co-PI). NSF National Research Traineeship grant #2152014. \$2,965,563, 9/2022 – 10/2027

“CC* Compute: The MSU Data Machine - a high-memory, GPU-enabled compute cluster for data-intensive and AI applications,” PI: Brian O'Shea, NSF Campus Cyberinfrastructure grant #2200792. \$399,864, 8/2022-7/2025

“Gas and Galaxies through Cosmic Time with Enzo-E,” PI: Molly Peeples (I am MSU PI). NASA TCAN Grant # 80NSSC21K1053, \$245,902, 6/2021-5/2025

“Baryon Cycles in the Biggest Galaxies,” PI: Mark Voit (I am co-PI). NSF Grant #2106575, \$541,163, 9/2021-8/2025

“CC* Networking Infrastructure: A Science DMZ For Quantitative Biology and Precision Agriculture,” PI: Brian O'Shea, NSF Campus CyberInfrastructure grant #2018432, \$483,122, 7/2020-6/2022.

“Strategic Partnership Grant: The Institute for Biodiversity, Ecology, Evolution, and Macrosystems (IBEEEM),” PI: Phoebe Zarnetske (I am a co-I). MSU Strategic Partnership Grant (MSU Foundation), \$480,000, 7/2021-6/2024

“Connecting the Smoke to the Fire: Mapping Andromeda's Inner Circumgalactic Medium,” PI: Nicolas Lehner (I am the MSU PI), Hubble Space Telescope grant. HST proposal #16730. \$12,858 to MSU, 5/2022-1/2025

“HDR DSC: Increasing Accessibility through Building Alternative Data Science Pathways,” PI: Andrew Christlieb (I am a co-PI). NSF grant #2123260, \$1,022,779, 9/2021-8/2024

“Creating equitable pathways to advanced degrees in data science, a Spelman MSU partnership,” PI: Andrew Christlieb (I am a co-PI). Alfred P. Sloan Foundation, \$205,179, 1/2022-12/2024.

“Collaborative Proposal:Framework:Software:NSCI:Enzo for the Exascale Era (Enzo-E),” MSU PI: Brian O'Shea (Michael Norman at UC San Diego is the overall PI). NSF CSSI program grant #1835402, \$480,055 (MSU component), 10/1/2018 – 9/31/2022

“NRT-HDR: Intersecting computational and data science to address grand challenges in plant biology,” PI: Shinhan Shiu (I am co-PI). NSF NRT program, grant #1828149, \$2,999,052, 10/1/2018-9/31/2023

“A Framework for Data Intensive Discovery in Multimessenger Astrophysics,” MSU PI: Claudio Kopper (I am co-PI), \$2,800,000, NSF award #1934752, 9/2019-8/2022

“Collaborative Research: The Spatially Resolved Circumgalactic Medium of Galaxies,” MSU PI Brian O'Shea, NSF AAG grant #1908109, \$242,250, 8/2019-7/2022

“Precipitation-regulated AGN Feedback in Halos from 10^{12} - 10^{15} Msun,” MSU PIs: Mark Voit and Brian O'Shea, NASA Chandra Theory Grant, \$60K, 1/1/2018-12/31/2019

“Figuring Out Gas & Galaxies in Enzo (FOGGIE): The Gas-Galaxy Connection at $z>2$,” MSU PI: Brian O'Shea (Molly Peeples at STScI is the overall PI), NASA Astrophysics Theory Program grant #80NSSC18K1105, \$86,105 (MSU component), 8/1/2018-7/31/2021

“REU Site: ICER ACRES: iCER Advanced Computational Research Experience for Students,” PIs: Kenneth Merz & Brian O'Shea, NSF REU program, grant #1560168, \$360K, 3/1/2016-2/28/2019; Renewal with PI O'Shea and co-PI Arjun Krishnan, NSF grant #1949921, \$401,234, 4/2020-3/2023

"Collaborative research: Multiscale physics and feedback in real and simulated circumgalactic gas over cosmic time," MSU PI: Brian O'Shea, NSF AST program, grant #1514700, \$234,275, 9/14/2015 – 9/13/2019

"Can thermal instabilities drive galactic precipitation and explain observed circumgalactic structure?", PI: Brian O'Shea, Hubble Theory Program, grant #AR-14315, \$60K, 12/1/2015-11/30/2016

"Petascale adaptive mesh simulations of Milky Way-type galaxies and their environments," PI: Brian O'Shea, NSF PRAC program #1514580, \$32K and 80 million core-hours on Blue Waters, 9/1/2015 – 8/31/2017.

"Beyond the fluid approximation: Improved modeling of the intracluster plasma," PI: Brian O'Shea. NASA ATP program, grant #14-ATP14-0038, \$631,630, 10/1/2015 – 9/31/2018

"Unlocking the secrets of absorption line complexes in the intergalactic medium," PI: Brian O'Shea. Hubble Theory Program, grant #AR-13261.01, \$53K, 10/1/2013-9/30/2015.

"Modeling multi-wavelength observations of galaxy clusters with adaptive mesh refinement cosmological simulations." PI: Brian O'Shea. NASA ATP program, grant #NNX12AC98G, \$534K, 1/1/2012-12/31/2016

"Collaborative research: Software institute for abstractions and methodologies for HPC simulation codes on Future Architectures." PI: Anshu Dubey (I am a co-PI). NSF SI2 program. MSU component is \$9,218, 7/1/2012-6/30/2014.

"The astrophysics of galaxy clusters: the effect of nonthermal baryonic processes on cluster observables." PI: Brian O'Shea. NASA ATP Program, Grant #08-ATFP08-0028, \$238,989, 2/1/2009 – 1/31/2012

"Formation of the First Galaxies: predictions for the next generation of observatories." PI: Brian O'Shea. NSF PRAC program, grant #0832662. \$40,000. 5/1/2009-4/31/2013

"Tracing the History of Galaxy Formation." PI: Brian O'Shea. DOE/LANL IGPP collaborative grant program. \$150,000. 10/1/2009 – 9/31/2012

"Cooling and star formation in the Universe's largest galaxies." PI: Mark Voit (I am a co-PI). NSF AST program, grant #0908819. \$267,520, 9/15/2009-8/31/2013

"CDI Type II Proposal: From models and data to knowledge and understanding." NSF CDI program, grant #0941373. PI: Scott Pratt (I am a co-PI). \$2,360,715. 11/1/2009-10/31/2014

"Predicting the Gamma-ray signature of cosmic ray protons in galaxy clusters using numerical cosmological simulations." PI: Eric Hallman (CU Boulder). I am a co-PI. NASA Fermi guest investigator program, Cycle 2. Grant #21077. \$79,921. 8/14/2009-8/13/2010.

"Conduction and multiphase structure in the ICM," PI: Mark Voit (MSU). I am a co-PI. NASA Chandra Theory Program, grant #TM9-0008X. \$76,403. 1/1/2009-12/31/2009

Computing time awarded

"Feedback and energetics from magnetized AGN jets in galaxy groups and clusters." PI: Brian O'Shea (all co-PIs are my former students and postdocs). DOE INCITE Leadership Computing program. 1.26 million Frontier node-hours (630K in 2023; renewed for 600K in 2024).

"Probing galaxy formation at low and high redshifts." PI: Brian O'Shea. NSF XRAC program (Formerly via NSF XSEDE; now ACCESS), Grant #TG-AST090040 (MCA08X028). 6.28M CPU-hours (2008), 3.2M CPU-hours (2010; renewal), 4.5M CPU-hours (2011; renewal), 4.7M CPU-hours (2012;

renewal); 1.53M CPU-hours (2014; renewal); 284K node-hours (2017; renewal; note change from CPU- to node-hours); 1.3M Comet core-hours and 182K Stampede2 node-hours (2019; renewal); 20K Stampede node-hours, 3.2M Expanse core-hours and 15K Expanse GPU-hours; 300K Delta core-hours and 84K Delta GPU-hours (2021; renewal); 1.7M Expanse CPU core-hours; 42K Delta GPU-hours; 70K Delta CPU-hours (2023; renewal); 120K Delta GPU-hours; 4.32M Expanse CPU core-hours; 70K Stampede3 node-hours; 2M Jetstream Sus (2024; renewal)

"Measuring performance and scaling of Kokkos-accelerated Athena++ on Summit." PI: Brian O'Shea. Oak Ridge Leadership Computing Facility Director's Discretionary Time. 100K Summit node-hours (2019); renewed for an additional 100K node-hours in 2020, and again in 2021, 2022, 2023, and 2024.

"The compressible, magnetized Taylor-Green Vortex," PI: Dr. Philipp Grete (I am the co-PI), NSF XRAC program, Grant #AST190021, 7/1/2019-6/30/2020, 40K Stampede2 node-hours.

"Precipitation-regulated AGN feedback in halos from 10^{12} - 10^{15} Msun," PI: Dr. Deovrat Prasad (I am the co-PI), NSF XRAC program, Grant #190022, 7/1/2019-6/31/2020 (with extension), 550K core-hours on Comet; 1/1/2020-12/31/2021, 84K core-hours on Expanse.

"Probing the fossils of the Local Group using petascale adaptive mesh galaxy simulations," PI: Brian O'Shea, NSF PRAC program, 6/1/2018 – 3/31/2019, 24 million core-hours on Blue Waters.

"Beyond the Fluid Approximation: Improved Modeling of the Intracluster Plasma," PI: Brian O'Shea, NASA HEC program (SMD-15-6514 and SMD-16-7720, on Pleiades). 100K SBUs (2015), 853K SBUs (2016), 1M SBUs (2017), 1M SBUs (2018). Note: 4 SBUs is approximately 1 node-hour (24 core-hours) on Pleiades.

"Petascale adaptive mesh simulations of Milky Way-type galaxies and their environments," PI: Brian O'Shea, NSF PRAC program, 9/1/2015 – 1/31/2018, 80 million core-hours on Blue Waters.

"Petascale adaptive mesh simulations of Milky Way-type galaxies and their environments." PI: Brian O'Shea. Great Lakes Consortium for Petascale Computation program (for Blue Waters), 4/1/2015 – 3/31/2016, 12.8 million CPU-hours.

"Formation of the First Galaxies: Predictions for the Next Generation of Observatories." PI: Brian O'Shea. NSF PRAC program (for the Blue Waters supercomputer), 2013-2015. 124 million CPU-hours.

"Computational studies of cosmological structure on the largest scales: galaxy clusters and filaments." PI: Eric Hallman (I am a co-PI). NSF XRAC program, grant #TG-AST100004. 4.4 million CPU-hours (2010), 4.5 million CPU-hours (2010; renewal), 2.5 million CPU-hours (2011; renewal), 3.9 million CPU-hours (2012; renewal); 1.0 million CPU-hours (2014; renewal)

"Understanding the nature of the missing baryons and the warm-hot intergalactic medium," PI: Britton Smith (I am a co-PI). NSF XRAC program, grant #TG-AST120009. 7.5 million CPU-hours (2012)

"Characterizing the formation history of the Milky Way," PI: Facundo Gomez (I am a co-PI). NSF XRAC program, grant #TG-AST120022. 1.2 million CPU-hours (2012); 3.93 million CPU-hours (2014; renewal)

"Searching for the missing baryons: non-equilibrium chemistry and synthetic spectra," PI: Devin Silvia (I am a co-PI). NSF XRAC program, grant #TG-AST140065. 1.1 million CPU-hours (2014)

"Examining the Processes of Formation and Feedback for Stars and AGN in the AMR Code Enzo," PI: John Wise (I am a co-PI). NSF XRAC program, grant #TG-AST140081. 868,000 CPU-hours (2014)

Experiment-related awards

"Pulsed magnetic jets as models for astrophysical jets," PI: Pat Knapp (I am one of two co-PIs). Awarded 12/2024. Sandia Z Fundamental Science Program. Two sets of shots (4 total) on the [Sandia Z Pulsed Power Facility](#) (the "Z Machine") in 2025 and 2026.

Service

National service: Enzo project (<http://enzo-project.org>) community leader and software developer (2000-present), NSF "Future of HPC in the United States" panelist, 2009-2012, Great Lakes Consortium for Petascale Computing Applications Committee (2009-present), Argonne National Laboratory CELS review panel (2015), Blue Waters SETAC Advisory Panel (2016-2019), LANL CSES advisory panel (2016-2019), "Beyond Blue Waters" advisory panel (astrophysics section leader), US Extremely Large Telescope (ELT) Program Advisory Committee (2018-2019), SUNY-Stony Brook Institute for Advanced Computational Science External Advisory Panel (2020-present), ACCESS Research Advisory Committee (2023-present)

University committees: Computational Science Department Committee (co-chair), Learning Management Systems Futures Committee, CIRTl advisory council / FAST fellowship advisory committee, CRCSTL advisory panel, ICER Scientific Advisory Panel, AI Advisory Committee, NIH Data Management working group

College-level (LBC) and departmental (Physics and CMSE) committees: LBC Educational Policy Committee (Chair, 2013-15), LBC Student Evaluation Committee (2011-13), JINA advisory committee (2008-present), astrophysics seminar co-chair (AY2010-11, 12-13, 15-16), galaxy formation discussion group organizer (2012-14), biophysics search committee (2011-12), LBC physics faculty search committee (2013-14; chair), CMSE Chair's Advisory Committee (2015-2017), CMSE Graduate Studies Committee (2015-present), CMSE Undergraduate Study Committee (2015-2020), CMSE search committees (2015-16, 2016-17 [chair], 2017-18, 2018-19 [chair], 2019-20 [chair]), P&A "Computing through the Curriculum" committee (2016-present), CMSE data science degree committee (2017-2020), PI and leader of CMSE/ICER REU (2016-present), CMSE Colloquium committee (2016-2019; chair), CMSE Learning and Research Technology Committee (2017-present), PA RPT Committee (2017-present; occasionally), CMSE Strategic Planning Committee (2015-2017), CMSE Graduate Director (2015-2019), CMSE Departmental Advisory Committee (2019-2022; chair); CMSE Reappointment, Promotion, and Tenure Committee (2017-present; chair 2020-present); CMSE teaching assignment committee (2016-2025; chair), Engineering College Advisory Committee (ECAC; 2022-2025), Engineering College Research Committee

Referee for The Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Advances in Astronomy, New Astronomy Reviews, Science, Nature, Parallel Computing, and the Journal of Computational Science Education.

Reviewer for DOE (funding and computing time; INCITE, SciDAC, ALCF), Research Corporation for Science Advancement, National Science Foundation, NASA, Netherlands Organization for Scientific Research, the Templeton Foundation, the Krell Institute

Conference Organization: First Stars III (Santa Fe, 2007; LOC chair), Chair of JINA GCE 2010 workshop organizing committee (in East Lansing, MI, April 29-May 1, 2010), 1st Annual Enzo User and Developer Workshop (San Diego, 2010; SOC and LOC), Enzo Developer Workshop (East Lansing, 2011; LOC Chair), Enzo Developer workshop (New York, 2011, SOC), YT user workshop (Chicago, 2012; SOC), Nuclear Astrophysics Town Meeting (Detroit, 2012; SOC member, GCE/BBN working group chair), University of Chicago SIMAC workshop (Chicago, 2012; SOC), Notre Dame Workshop on the Circumgalactic Medium (South Bend, IN, 2014, SOC), SC14 (Applications technical

committee; 2014), Great Lakes Cosmology Workshop 2016, Forging Connections: From Nuclei to the Cosmos (2017; chair of SOC and LOC), Education 2035 (East Lansing, MI, 2019, LOC/SOC), "Algorithms for Multiphysics Models in the Post-Moore's Law Era" (Los Alamos, NM, 2025, Lead organizer of LOC and SOC)

Conference proceedings: Chief editor of First Stars III conference proceedings, American (Institute of Physics Conference Proceedings Series #990, 2008)

Professional memberships: American Astronomical Society (1998-present), American Physical Society (1998-present), Society of Industrial and Applied Mathematics (2015-present), International Astronomical Union, American Association of Physics Teachers (2008-2015), American Association for the Advancement of Science (2008-2012),

Community Outreach

Lecturer, MSU Physics of Atomic Nuclei Summer School, 2009-present
MSU Research Experience for Undergraduates seminar speaker, 2009-present
Presenter at Astronomical Horizons lecture series, MSU Abrams Planetarium, 2008-present
Impression 5 Physics & Astronomy Day, 2015 - present (lead organizer 2015-2016)
Astronomy on Tap presenter and panelist, 2015-present
MSU Data Science Student Association, faculty advisor (2016-present)
Lecturer on computational astrophysics, MSU Society of Physics Students, 2009, 2013, 2014, 2017
MSU Grandparents University, 2009-2014
Michigan Science Olympiad, 2009-2014
Judge, New Mexico Supercomputing Challenge, 2006, 2007
EarthWatch Lecturer, Los Alamos National Lab Bradbury Science Museum, 2007
Los Alamos Summer School Lecturer, 2006-2008

Refereed Astrophysics, Plasma Physics, and Computer Science Publications

Notes: the most up-to-date version of this list can be found at my [Google Scholar page](#). For papers published since 2008, papers coming from my research group or where I am the primary senior scientist in terms of intellectual contribution are denoted by an asterisk (*) after my name. Students or postdoctoral researchers working in my research group at the time of paper publication are denoted by a + symbol after their name

126. *Project AMIGA: The Inner Circumgalactic Medium of Andromeda from Thick Disk to Halo*. N. Lehner et al. (including **B.W. O'Shea**), 2025, ApJ, submitted ([arXiv:2506.16573](#))
125. *Precipitation plausible: magnetized thermal instability in the intracluster medium*. B.D. Wibking⁺, G.M. Voit, **B.W. O'Shea**, 2025, MNRAS, submitted ([arXiv:2506.10277](#))
124. *Figuring Out Gas & Galaxies in Enzo (FOGGIE) X: Characterizing the Small-Scale Structure of the CGM and its Imprint on Observables*. R. Augustin, J. Tumlinson, M.S. Peeples, **B.W. O'Shea**, B.D. Smith, C. Lochhaas, A.C. Wright, A. Acharyya, J.K. Werk, N. Lehner, J.C. Howk, L. Corlies, R.C. Simons, J.M. O'Meara, 2025, ApJ, submitted ([arXiv:2501.06551](#))
123. *Figuring Out Gas & Galaxies in Enzo (FOGGIE) IX: The Angular Momentum Evolution of Milky Way-like Galaxies and their Circumgalactic Gas*. R.C. Simons, J. M.S. Peeples, J. Tumlinson, **B.W. O'Shea**, C. Lochhaas, A.C. Wright, A. Acharyya, R. Augustin, K.A. Hamilton-Campos, B.D. Smith, N. Lehner, J.K. Werk, Y. Zheng, 2024, ApJ, submitted ([arXiv:2409.17244](#))
122. *Application of the Cyberinfrastructure Production Function Model to R1 Institutions*. P. Smith, J. Gemmill, D.Y. Hancock, **B.W. O'Shea**, W. Snapp-Childs, J. Wilgenbusch. 2025, Frontiers in Research Metrics and Analytics, accepted ([arXiv:2501.10264](#))
121. *XMAGNET: Velocity structure functions of active galactic nucleus-driven turbulence in the multiphase intracluster medium*. M. Fournier, P. Grete, M. Brüggen, **B.W. O'Shea**, D. Prasad, B.D. Wibking, F.W. Glines, R. Mohapatra, [2025, Astronomy & Astrophysics, 698, id.A121](#)
120. *The XMAGNET Exascale MHD Simulations of SMBH Feedback in Galaxy Groups and Clusters: Overview and Preliminary Cluster Results*. P. Grete, **B.W. O'Shea**, F.W. Glines, D. Prasad, B.D. Wibking, M. Fournier, M. Brüggen, G.M. Voit, [2025, ApJ, 988, 155](#)
119. *Influence of initial conditions on data-driven model identification and information entropy for ideal MHD problems*. G. Vasey⁺, D. Messenger, D. Bortz, A. Christlieb, **B.W. O'Shea**^{*}, [2025, Journal of Computational Physics, 524, 113719](#)
118. *Precipitation possible: turbulence-driven thermal instability with constrained entropy profiles*. B.D. Wibking⁺, G.M. Voit, **B.W. O'Shea**^{*}, [2025, MNRAS, 537, 739-751](#)
117. *Figuring Out Gas & Galaxies in Enzo (FOGGIE) VIII: Complex and Stochastic Metallicity Gradients at $z > 2$* . A. Acharyya, M.S. Peeples, J. Tumlinson, **B.W. O'Shea**, C. Lochhaas, A.C. Wright, R.C. Simons, R. Augustin, B.D. Smith, E. Hyeonmin Lee, [2025, The Astrophysical Journal, 979, 129](#)
116. *A Heavy Seed Black Hole Mass Function at High Redshift -- Prospects for LISA*. J. McCaffery, J. Regan, B. Smith, J. Wise, **B.W. O'Shea**, M. Norman, [2025, Open Journal of Astrophysics, 8, 11](#)
115. *The properties of magnetized cold filaments in a cool-core galaxy cluster*. M. Fournier, P. Grete, M. Brüggen, F.W. Glines, **B.W. O'Shea**, [2024, Astronomy & Astrophysics, 691, 239](#)
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Publications, Presentations, and Additional Information - Brian W. O'Shea

- Smidt, J. & Norman, M.L., [2008, ApJ, 679, 925](#)
11. *Population III Star Formation in a Lambda CDM Universe, II: Effects of a photodissociation background*, **O'Shea, B.W.** & Norman, M.L., [2008, ApJ, 673, 14](#)
 10. *The Cosmic Code Comparison Project*, Heitmann, K., Lukic, Z., Fasel, P., Habib, S., Warren, M.S., White, M., Ahrens, J., Ankeny, L., Armstrong, R., **O'Shea, B.W.**, Ricker, P.M., Springel, V., Stadel, J., & Trac, H., [2008, Computational Science and Discovery, Volume 1, Article 015003](#)
 9. *The Santa Fe Light Cone Simulation Project: I. Confusion and the WHIM in upcoming Sunyaev-Zel'Dovich Effect Surveys*, Hallman, E.J., **O'Shea, B.W.**, Burns, J.O., Norman, M.L., Harkness, R. & Wagner, R., [2007, ApJ, 671, 27-39](#)
 8. *Population III Star Formation in a Lambda CDM Universe, I: Effect of Environment on Protostellar Accretion Rates*, **O'Shea, B.W.** & Norman, M.L., [2007, ApJ, 654, 66](#)
 7. *Population III Star Formation in a Lambda WDM Universe*, **O'Shea, B.W.** & Norman, M.L., [2006, ApJ, 648, 31](#)
 6. *CMB Polarization Due to Scattering in Clusters*, Shimon, M., Rephaeli, Y., **O'Shea, B.W.**, & Norman, M.L., [2006 MNRAS, 368, 511-517](#)
 5. *Comparing AMR and SPH Cosmological Simulations, I: Dark Matter & Adiabatic Simulations*, **O'Shea, B.W.**, Nagamine, K., Springel, V., Hernquist, L. & Norman, M.L., [2005, ApJS, 160, 1](#)
 4. *Forming a Primordial Star in a Relic HII Region*, **O'Shea, B.W.**, Abel, T., Whalen, D. & Norman, M.L., [2005, ApJ, 628, L5](#)
 3. *A Concordance Model of the Lyman-Alpha Forest at $z = 1.95$* , Jena, T., Norman, M.L., Tytler, D., Kirkman, D., Suzuki, N., Chapman, A., Melis, C., So, G., **O'Shea, B.W.**, Lin, W., Lubin, D., Paschos, P., Reimers, D., Janknecht, E., Fechner, C., [2005, MNRAS, 361, 70](#)
 2. *Did Massive Primordial Stars Preenrich the Lyman Alpha Forest?*, Norman, M.L., **O'Shea, B. W.**, & Paschos, P., [2004, ApJ, 601, L115-118](#)
 1. *Baryons in the Warm-Hot Intergalactic Medium*, Dave, R., Cen, R., Ostriker, J.P., Bryan, G.L., Hernquist, L., Katz, N., Weinberg, D.H., Norman, M.L. & **O'Shea, B. W.**, [2001, ApJ, 552, 473-483](#)

Refereed Education Research Publications

5. *A Learner-Centered Approach to Teaching Computational Modeling, Data Analysis, and Programming*, D. Silvia, **B.W. O'Shea**, B. Danielak, 2019, Proceedings of the International Conference on Computational Science – ICCS 2019, pp. 374-388
4. *Promoting interdisciplinary through climate change education*. A. McCright, **B.W. O'Shea**, R. Sweeder, G. Urquhart, and A.K. Zeleke. [2013, Nature Climate Change, DOI: 10.1038/NCLIMATE1844](#).
3. *From $F=ma$ to flying squirrels: Curricular change in an introductory physics course*. **B.W. O'Shea**, L. Terry, and W. Benenson. [2013, CBE-Life Science Education, 12, 230-238](#) ([ADS link](#))
2. *Assessing gender differences in response system questions for an introductory physics course*, Richardson, C. & **O'Shea, B.W.**, [2013, American Journal of Physics, 81, 231](#)
1. *Tutorials in Physics: The pain and the gain*, Cruz, E., **O'Shea, B.W.**, Schaffenberger, W., Wolf, S., & Kortemeyer, G., [2010, The Physics Teacher, 48, 453-457](#)

Conference Proceedings, Research Notes, and Book Chapters

24. *Metagalactic Ultraviolet Background Tables for Calculating Diffuse Astrophysical Plasma Properties*, E. Taira⁺, C. Kopenhafer, B.W. O'Shea, [2025, Research Notes of the AAS, 9, 129](#)

23. *Analyzing Star Formation Feedback Mechanisms in Cosmological Simulations*, S.T. Fush⁺, **B.W. O'Shea**, D.W. Silvia, B.D. Smith, J.H. Wise. [2022, Research Notes of the AAS, 6, 38](#)
22. *Halo Environment for Population III Star Formation*, J. Grace⁺, **B.W. O'Shea**, & J.H. Wise, 2020, [Research Notes of the AAS, 4, 6](#)
21. *FRIB and the GW170817 Kilonova*, A. Aprahamian et al., proceedings for the FRIB Theory Alliance Workshop "FRIB and the GW170817 Kilonova," held 16-27 July 2018 ([arXiv:1809.00703](#))
20. *JINA-NuGrid Galactic Chemical Evolution Pipeline*, B. Cote, C. Ritter, F. Herwig, **B.W. O'Shea**, M. Pignatari, D. Silvia, S. Jones, C. Fryer, 2017, in Proceedings of Nuclei in the Cosmos XIV, [id.020203](#)
19. *The formation of the first second generation star*. B.D. Smith, J.W. Wise & **B.W. O'Shea**. 2012, in [Proceedings of First Stars IV – From Hayashi To The Future](#), AIP Conference Proceedings #1480, pp. 135-138
18. *Probing the formation of the Milky Way*. **B.W. O'Shea**, F. Gomez, C. Coleman-Smith, I. Minchev, J. Tumlinson, Y.S. Lee, and T. Beers. 2012, in [Galactic archaeology: Near-field cosmology and the formation of the Milky Way. Proceedings of the conference held 16-20 May 2011 in Shuzenji, Japan](#). Astronomical Society of the Pacific Conference Proceedings, Vol. 458
17. *Vertical density waves in the Milky Way induced by the Sagittarius dwarf galaxy*. F. Gomez, I. Minchev, **B.W. O'Shea**, T. Beers, J. Bullock and C. Purcell. 2012, in [Proceedings of the Argentina Astronomical Association](#), Vol. 55
16. *Characterizing the formation history of Milky Way-like stellar halos with model emulators*. F. Gomez, C. Coleman-Smith, **B.W. O'Shea**, J. Tumlinson, and R. Wolpert. 2012, in "Proceedings of the Argentina Astronomical Association, Vol. 55
15. *Protostellar Feedback Processes and the Mass of the First Stars*, Tan, J.C., Smith, B.D., & **O'Shea, B.W.**, in [Proceedings of The First Stars and Galaxies: Challenges for the Next Decade](#), Eds. D. Whalen, V. Bromm & N. Yoshida, 2010, AIP conference proceedings series.
14. *Local and Global Radiative Feedback from Population III Star Formation*, **O'Shea, B.W.** & Whalen, D. in [Proceedings of The First Stars and Galaxies: Challenges for the Next Decade](#), Eds. D. Whalen, V. Bromm & N. Yoshida, 2010, AIP conference proceedings series.
13. *Population III Binary Formation*, Turk, M., Abel, T., Norman, M.L. & **O'Shea, B.W.** in [Proceedings of The First Stars and Galaxies: Challenges for the Next Decade](#), Eds. D. Whalen, V. Bromm & N. Yoshida, 2010, AIP conference proceedings series.
12. *Towards More Realistic Simulations of Galaxy Clusters: Shocks and Radio Relics*, Skillman, S.W., O'Shea, B.W., Hallman, E.J. & Burns, J.O. [Proceedings of The Monster's Fiery Breath: Feedback in Galaxies, Groups and Clusters](#), Eds. S. Heinz & E. Wilcots, 2009, AIP conference proceedings series #1201, pp. 334-341
11. *Population III Supernovae and the Assembly of the First Galaxies*, Whalen, D.W., Van Veelen, B., **O'Shea, B.W.**, & Norman, M.L., [Proceedings of IAUS #255: Low Metallicity Star Formation: from the First Stars to the First Galaxies](#), Eds. L.K. Hunt, S. Madden, & R. Schneider, 2008 (arXiv: 0808.0524)
10. *First Stars III Conference Summary*, **O'Shea, B.W.**, McKee, C., Heger, A., & Abel, T. In [Proceedings of First Stars III](#), Eds. B. O'Shea, A. Heger & T. Abel, 2008, AIP conference proceedings series #990, pp. xiii-xxiii
9. *Toward Forming a Primordial Star in a Cosmological AMR Simulation*, Turk, M., Abel, T., & **O'Shea, B.W.** In [Proceedings of First Stars III](#), Eds. B. O'Shea, A. Heger & T. Abel, 2008, AIP conference proceedings series #990, pp. 16-20
8. *The Role of the First Metals in Forming the Second Stars*, Smith, B., Sigurdsson, S., **O'Shea, B.W.** & Norman, M.L. In [Proceedings of First Stars III](#), Eds. B. O'Shea, A. Heger & T. Abel, 2008, AIP conference proceedings series #990, pp. 73-75
7. *Photoionization of Clustered Halos by the First Stars*, Whalen, D. , **O'Shea, B.W.**, Smidt, B. & Norman, M.L. In [Proceedings of First Stars III](#), Eds. B. O'Shea, A. Heger & T. Abel, 2008, AIP conference proceedings series #990, pp. 381-385

6. *Simulating Cosmological Evolution with Enzo*, Norman, M.L., Bryan, G., Harkness, R., Border, J., Reynolds, D. **O'Shea, B.W.**, Wagner, R. In Petascale Computing: Algorithms and Applications, Ed. David Bader, CRC Press, 2007
5. *AMR simulations of the Cosmological Light Cone: SZE Surveys of the Synthetic Universe*, Hallman, E.J., **O'Shea, B.W.**, Norman, M.L., Wagner, R., and Burns, J.O. In Proceedings of Heating vs. Cooling in Galaxies and Clusters of Galaxies, MPA/ESO/MPE/USM Joint Astronomy Conference, Eds. H. Boehringer, P. Schuecker, G.W. Pratt & A. Finoguenov, Springer-Verlag, 2007
4. *Forming a Primordial Star in a Relic HII Region*, **O'Shea, B.W.**, Abel, T., Whalen, D. & Norman, M.L. In Proceedings of the International Astronomical Union Symposium 228 – From Lithium to Uranium: Elemental Tracers of Early Cosmic Evolution, Eds. V. Hill, P. Francois & F. Primas, Cambridge University Press, 2005
3. *Introducing Enzo, an AMR Cosmology Application*, **O'Shea, B.W.**, Bryan, G., Bordner, J., Norman, M.L., Abel, T., Harkness, R. & Kritsuk, A. In Adaptive Mesh Refinement – Theory and Applications, Eds. T. Plewa, T. Linde & V.G. Weirs, Springer Lecture Notes in Computational Science and Engineering, 2004
2. *Towards Optimizing Enzo, an AMR Cosmology Application*, Bordner, J., Bryan, G., Harkness, R., Kritsuk, A., Norman, M.L. & **O'Shea, B.W.** In Adaptive Mesh Refinement – Theory and Applications, Eds. T. Plewa, T. Linde & V.G. Weirs, Springer Lecture Notes in Computational Science and Engineering, 2004
1. *Studying Dark Energy with Galaxy Cluster Simulations*, Mohr, J., **O'Shea, B.W.**, Evrard, A., Bialek, J. & Haiman, Z. in Proceedings of Dark Matter 2002

Review Articles, White Papers and Technical Reports

14. Horizons: Nuclear Astrophysics in the 2020s and Beyond, H. Schatz et al. [2022, Journal of Physics G. 49, id.110502](#)
13. Cyberinfrastructure Requirements to Enhance Multi-messenger Astrophysics. P. Chang et al. 2019. Astro2020 white paper ([arXiv:1903.04590](#))
12. Understanding the circumgalactic medium is critical for understanding galaxy evolution. M. Peebles et al. 2019. Astro2020 white paper ([arXiv:1903.05644](#))
11. *Catching Element Formation In The Act ; The Case for a New MeV Gamma-Ray Mission: Radionuclide Astronomy in the 2020s*. F.X. Timmes et al. (100+ authors total). 2019. Astro2020 white paper ([arXiv:1902.02915](#))
10. *Circumgalactic Gas and the Precipitation Limit*. Voit, G. M., Babul, A., Babyk, Iu., Bryan, G. L., Chen, H. -W., Donahue, M., Fielding, D., Gaspari, M., Li, Y., McDonald, M., **O'Shea, B. W.**, Prasad, D., Sharma, P., Sun, M., Tremblay, G., Werk, J., Werner, N., Zahedy, F. 2019. Astro2020 white paper ([arXiv:1903.11212](#))
9. *r-Process Nucleosynthesis: Connecting Rare-Isotope Beam Facilities with the Cosmos*, C.J. Horowitz et al., 2018, submitted to Journal of Physics G ([arXiv:1805.04637](#))
8. *The Importance of Computation in Astronomy Education*, M. Zingale, F.X. Timmes, R. Fisher, B.W. O'Shea, submitted to the AAS Education Taskforce Call, June 2016 ([arXiv:1606.02242](#))
7. *ASCR/HEP Exascale Requirements report*. S. Habib et al., community report for the ASCR/HEP Exascale Requirements Review meeting held in June, 2015 ([arXiv:1603.09303](#))
6. *White paper on nuclear astrophysics*, A. Arcones et al., community white paper based on 2012 JINA Town Meeting in Detroit, MI and 2014 APS Town Meeting in College Station, TX. Lead author: H. Schatz, Michigan State University ([arXiv:1603.02213](#))
5. *Snowmass Computing Frontier: Computing for the Cosmic Frontier, Astrophysics, and Cosmology*. A. Connolly, S. Habib, A. Szalay, J. Borrill, G. Fuller, N. Gnedin, K. Heitmann, D. Jacobs, D. Lamb, T. Mezzacappa, B. Messer, S. Myers, B. Nord, P. Nugent, **B.W. O'Shea**, P. Ricker, M. Schneider. 2013. Snowmass working group report. ([arXiv:1311.2841](#))
4. *Dissecting the Epoch of Reionization with Discrete, Embedded Sources*. White Paper for the 2010 Astronomy

Publications, Presentations, and Additional Information - Brian W. O'Shea

Decadal Review. Lead author: Jason Prochaska, UC Santa Cruz. 2009 ([ADS link](#))

3. *Tracing the cosmic star formation history to its beginnings: Gamma ray bursts as tools*. White Paper for the 2010 Astronomy Decadal Review. Lead author: Dieter Hartmann, Clemson U. 2009 ([ADS link](#))
2. *Nuclei in the cosmos*. White Paper for the 2010 Astronomy Decadal Review. Lead author: Ed Brown, MSU. 2009 ([ADS link](#))
1. *First light sources at the end of the dark ages: Direct observations of Pop III stars, proto-galaxies, and supernovae during the reionization epoch*. White Paper for the 2010 Astronomy Decadal Review. Lead authors: Jeff Cooke and Asantha Cooray, UC Irvine. 2009 ([ADS link](#))

Invited Conference Talks, Seminars, and Colloquia

2025:

1. University of New Mexico Astrophysics seminar, Albuquerque, NM, Feb. 13, 2025
2. New Mexico State University Astronomy colloquium, Las Cruces, NM, March 7, 2025
3. New Mexico Institute of Mining and Technology physics colloquium, Socorro, NM, March 27, 2025
4. Ulam Fellow Invited Lecture, Los Alamos National Laboratory Center for Nonlinear Studies Colloquium, Los Alamos, NM, July 21, 2025

2024:

1. Los Alamos National Laboratory Astrophysics seminar, Los Alamos, NM, April 23, 2024
2. Physics of the Intracluster Medium: Theory and Computation conference, Ann Arbor, MI, June 24-28, 2024
3. Sandia Z Fundamental Science Workshop, Albuquerque, NM Aug. 6-9, 2024
4. University of Pittsburgh Astrophysics seminar, Pittsburgh, PA, Nov. 8, 2024

2023:

1. Oases in the Cosmic Desert, Tempe, AZ, Feb. 21-24, 2023
2. Enzo/Enzo-E Collaboration Meeting, San Diego, CA, May 8-11, 2023
3. Joint Institute for Nuclear Astrophysics meeting, East Lansing, MI, May 21-25, 2023
4. Festschrift for Michael Norman, Kloster Seeon, Seeon-Seebruck, Germany, June 6-9, 2023

2022

1. JINA Frontiers Workshop, May 2022
2. Sandia Z Fundamental Science Workshop, August 2022
3. University of Notre Dame astrophysics seminar, November 2022

2021

1. PASC21 Conference (virtual), July 2021
2. PICUP Virtual Capstone Conference (keynote speaker; virtual), August 2021
3. IEEE HPEC Conference (virtual), September 2021

2020:

1. Bates College Physics Colloquium, February 2020
2. JINA Galactic Chemical Evolution Workshop, March 2020
3. Where the Star Formation Ends, Leiden, the Netherlands, April 2020 (CANCELLED – COVID)
4. Plenary speaker, PICUP Capstone Conference, Grand Rapids, MI, July 2020 (CANCELLED – COVID)
5. ASTRONUM-2020, Pasadena, CA, July 2020 (CANCELLED – COVID)

2019:

1. Florida State University Physics Colloquium, January 2019
2. Physics and astrophysics of the intracluster medium, Budapest, Hungary, March 2019
3. Galaxy formation seminar, Johns Hopkins University, April 2019
4. Fundamental Science with Pulsed Power meeting, hosted by Sandia National laboratories, August 2019
5. Notre Dame Astrophysics Seminar, September 2019
6. Notre Dame Physics Colloquium, September 2019
7. Oakland University Physics Colloquium, October 2019

2018:

1. University of Oregon Institute for Theoretical Science Colloquium, January 2018
2. Oregon State University Physics Colloquium, January 2018
3. University of Washington in Seattle Astronomy Colloquium, January 2018
4. Blue Waters Symposium, June 2018 (one review talk, one invited science talk)

Publications, Presentations, and Additional Information - Brian W. O'Shea

5. AstroNum 2018, June 2018
6. University of Alabama Physics Colloquium, October 2018
7. Argonne National Lab Computational Science colloquium, October 2018
8. Northwestern University CIERA colloquium, October 2018
9. University of Minnesota Astrophysics colloquium, November 2018

2017:

1. SIAM Computational Science and Engineering meeting, Atlanta, February 2017
2. Boston College Physics Colloquium, April 2017
3. Central Michigan University Fall Equinox seminar, September 2017
4. University of Waterloo Astronomy Colloquium, October 2017
5. University of Toronto CITA Colloquium, October 2017
6. UC Berkeley Institute for Theory and Computation seminar, November 2017
7. Stanford KIPAC seminar, November 2017
8. Space Telescope Science Institute Galaxies seminar, December 2017

2016:

1. UC San Diego Astrophysics Seminar, February 2016
2. UC Irvine Astronomy Colloquium, February 2016
3. University of Colorado at Boulder JILA seminar, March 2016
4. Yale Center for Astronomy and Astrophysics Seminar, April 2016
5. Los Alamos National Lab LA-Astro seminar, May 2016
6. JINA R-process workshop, June 2016
7. Blue Waters symposium, June 2016
8. HAWC collaboration meeting (review), July 2016
9. ICM Plasma Physics Workshop, August 2016
10. SUNY Stonybrook Physics Colloquium, September 2016

2015:

1. Florida State University Physics Colloquium, February 2015
2. Arizona State University cosmology seminar, February 2015
3. U. Illinois (Urbana-Champaign) Astronomy Colloquium, March 2015
4. NCSA Director's Colloquium, March 2015
5. U. Michigan Galaxy Cluster seminar, April 2015
6. APS April Meeting, D. Comp. Phys. Invited talk, April 2015
7. U. Michigan Astronomy Colloquium, April 2015
8. U. Michigan Education Research seminar, April 2015
9. NCSA Blue Waters Symposium, May 2015
10. U. Victoria Nucleosynthesis Symposium, May 2015
11. NC State Physics Colloquium, November 2015

2014:

1. Notre Dame Circumgalactic Medium workshop, January 2014
2. UC Irvine Near Field/Far Field Connection conference, February 2014
3. U. Wisconsin Astronomy Colloquium, March 2014
4. Blue Waters Symposium, UIUC, May 2014
5. Quenching & Quiescence Conference, Heidelberg, July 2014
6. Intracluster medium theory and simulation workshop, Copenhagen, August 2014
7. HEP/astrophysics seminar, U. Michigan, September 2014
8. Purdue University astrophysics seminar, November 2014
9. Indiana University Astronomy Colloquium, November 2014
10. Georgia Institute of Technology astrophysics seminar, December 2014

2013:

Publications, Presentations, and Additional Information - Brian W. O'Shea

1. University of Chicago Astrophysics Colloquium, Mar. 2013
2. NCSA Private Sector Partnership meeting, May 2013
3. Aspen Center for Physics workshop on Milky Way formation, July 2013
4. MSU Physics Colloquium, September 2013
5. Lyman Briggs College faculty seminar, November 2013

2012:

1. U. Kentucky astronomy colloquium, Feb. 2012
2. U. Kentucky Center for Computational Sciences Seminar, Feb. 2012
3. Case Western Reserve University, astronomy colloquium, Feb. 2012
4. Ohio State Astronomy Colloquium, Feb. 2012
5. Ohio State physics education seminar, Feb. 2012
6. University of Colorado Astronomy colloquium, March 2012
7. University of Washington Astronomy Colloquium, April 2012
8. Numerical Cosmology 2012, Cambridge, England: **Review talk**, "Comparisons of grid and particle-based methods for cosmological hydrodynamics," July 2012
9. University of Chicago Community Code workshop, "The Enzo community code," September 2012

2011:

1. At "3rd Subaru International Conference," Shuzenji, Japan, Nov. 2011
2. MSU Institute for Cyber-Enabled Research interdisciplinary seminar, Nov. 2011
3. National Institute for Computational Science Director's colloquium, Oak Ridge National Laboratory, October 2011
4. University of Michigan galaxy formation seminar, Sep. 2011
5. MSU ArtScience symposium, June 2011
6. Harvard CfA Institute for Theory and Computation seminar, May 2011
7. Los Alamos National Laboratory astrophysics seminar, May 2011
8. Two invited lectures on N-body simulations in cosmology, TIARA computational astrophysics summer school, Taiwan, Jan. 2011

2010:

1. Michigan State University Galaxy formation seminar, June 2010
2. "The First Stars and Galaxies: Challenges for the Next Decade," University of Texas, Austin, March 2010

2009:

1. "Extreme star formation in dwarf galaxies," University of Michigan, Ann Arbor, July 2009
2. University of Minnesota astronomy colloquium, April 2009
3. University of Minnesota stellar evolution seminar, April 2009

2008:

1. Michigan State University astronomy seminar, Nov. 2008
2. University of Michigan astronomy colloquium, October 2008
3. UC Santa Cruz astronomy colloquium, April 2008
4. Stanford University ACKS seminar, April 2008
5. Michigan State University astronomy seminar, January 2008

2007:

1. University of Chicago astrophysics seminar, Nov. 2007
2. Seminar given "Star formation through cosmic time" workshop, hosted by KITP, UC Santa Barbara, Oct. 2007
3. Fermi National Accelerator Laboratory astrophysics seminar, Sept. 2007
4. University of Notre Dame astrophysics seminar, Sept. 2007
5. Talk given at "Star formation through cosmic time" conference, hosted by KITP, UC Santa Barbara, August 2007

Publications, Presentations, and Additional Information - Brian W. O'Shea

6. Santa Fe Cosmology Workshop, hosted by Los Alamos National Laboratory – **review talk**. July 2007
7. Keele University astrophysics seminar, June 2007
8. University of Central Lancashire astrophysics seminar, June 2007
9. University College London Computational science lecture series, June 2007
10. University College London astrophysics colloquium, June 2007
11. University of New Mexico Institute for Advanced Studies seminar, April 2007

2006 and before:

1. University of Florida astronomy seminar, Dec. 2006
2. University of New Mexico particle physics seminar, Nov. 2006
3. Columbia University astronomy seminar, Oct. 2006
4. American Museum of Natural History astrophysics seminar, Oct. 2006
5. Los Alamos National Laboratory astrophysics seminar, Sept. 2006
6. At "Physics and astrophysics of supermassive black holes," hosted by Los Alamos National Laboratory, July 2006
7. At "First Stars," a workshop hosted by the Institute for Nuclear Theory, University of Washington, July 2006
8. University of Colorado at Boulder JILA seminar, April 2006
9. UC Berkeley astrophysics lunch seminar, Nov. 2005
10. Stanford astrophysics lunch seminar, Nov. 2005
11. At "SF05 Cosmology Summer Workshop," hosted by Los Alamos National Laboratory, Santa Fe, NM, July 2005
12. At "Chemical Enrichment of the Early Universe," hosted by Los Alamos National Laboratory, Santa FE, NM, August 2004
13. At "A workshop on adaptive mesh refinement methods in cosmology," University of Durham, England, June 2004

Contributed Conference Talks and Posters

2024:

1. APS Division of Plasma Physics annual meeting, Atlanta, GA, October 2024

2023:

1. Dense Z-Pinch Meeting, Ann Arbor, MI, July 9-13, 2023
2. Black Holes on Broadway, Center for Computational Astrophysics, New York, NY, Dec. 3-7, 2023

2022:

1. Parthenon user and developer meeting, Los Alamos, NM. Oct. 2022

2016:

1. At the JINA Frontiers Meeting, East Lansing, MI Mar. 2016
2. International Conference on Computational Science, June 2016

2015:

1. At the JINA Frontiers Meeting, East Lansing, MI, Mar. 2015

2012:

1. At the 2012 Joint Space Science Institute workshop on "Nature's particle accelerators," Oct. 22-25, 2012, Annapolis, MD (talk)

2011:

1. At 2011 Enzo Workshop, October 2011 (talk)
2. At "TeraGrid 2011," July 2011 (talk)
3. Kavli Institute for Theoretical Astrophysics galaxy cluster formation conference, March 2011 (poster)

Publications, Presentations, and Additional Information - Brian W. O'Shea

2010:

1. At "Teragrid 2010", Pittsburgh, PA, August 2010 (talk)
2. At "From first stars to galaxies," University of Florida, Gainesville, April 2010 (talk)

2009:

1. At "The Monster's Fiery Breath," University of Wisconsin, Madison, June 2009 (talk)

2008:

1. At "The Warm and Hot Universe," Columbia University, New York, April 2008 (talk)
2. At the American Astronomical Society 211th meeting, Austin, TX, Jan. 2008. (1 talk, 1 poster)

2007:

1. At "Radio surveys: science and techniques," Los Alamos, NM, April 2007 (talk)
2. At "A new zeal for old galaxies," Rotorua, New Zealand, March 2007 (talk)

2006 and before:

1. At the Space Telescope Science Institute May Symposium on "Massive stars, from Pop III and GRBs to the Milky Way," Baltimore, MD, May 2006 (2 posters)
2. At the Space Telescope Science Institute mini-workshop on "The End of the Dark Ages," Baltimore, MD, March 2006 (1 talk, 1 poster)
3. At "Protostars and Planets V," Hawaii, October 2006 (poster)
4. At "International Astronomical Union Symposium 228 - From Lithium to Uranium: Early Tracers of Cosmic Chemical Evolution," Paris, France, May 2005 (poster)
5. At the 205th meeting of the American Astronomical Society, Jan. 2005, San Diego, CA (talk)
6. At the "1st Arizona-Heidelberg Symposium: The High Redshift Frontier," Tucson, AZ, Nov. 2004 (talk)
7. At "A Workshop on Adaptive Mesh Refinement Methods in Cosmology," University of Durham, June 2004 (talk)
8. At the "3rd Annual Theoretical Astrophysics in Southern California (TASC) Meeting," UCLA, October 2003 (talk)
9. At the "Chicago Workshop on Adaptive Refinement Methods," University of Chicago, Sept. 2003 (talk)
10. At the "3rd Annual Theoretical Astrophysics in Southern California (TASC) Meeting," Santa Barbara, CA, October 2002 (talk)

Graduate Student and Postdoctoral Researcher Outcomes

MS and PhD students:

1. [Carolyn Peruta](#) (MSU Astrophysics PhD, 2013): Education Support Scientist, Sonoma State University
2. [Sam Skillman](#) (CU/Boulder Astrophysics PhD, 2013; co-advised with Jack Burns): Cloud HPC Architect, Google (formerly Chief Architect at Descartes Labs)
3. [Greg Meece](#) (MSU Astrophysics PhD, 2016; co-advised with Mark Voit): Business Intelligence Analyst, Sparrow Health System
4. [Brian Crosby](#) (MSU Astrophysics PhD, 2016): Data Scientist (energy futures industry), self-employed
5. [Jared Carlson](#) (MSU CMSE MS, 2021; co-advised with Sean Couch): Senior AI Engineer, Techcyte
6. [Forrest Glines](#) (MSU Astrophysics + CMSE dual PhD, 2022): Metropolis Fellow, Los Alamos National Laboratory, then Research Software Engineer at NVIDIA
7. [Claire Kopenhafer](#) (MSU Astrophysics + CMSE dual PhD, 2022): Research Consultant, Michigan State University Institute for Cyber-Enabled Research

Postdoctoral researchers:

1. [Britton Smith](#) (2009-2012), Chancellor's Fellow, University of Edinburgh
2. [Facundo Gomez](#) (2011-2014), Professor, Universidad de La Serena Department of Astronomy
3. [Devin Silvia](#) (2013-17; NSF AAPF 2014-17), Teaching Specialist, Michigan State University Department of Computational Mathematics, Science, and Engineering
4. [Brian Danielak](#) (2015-2017), Keystone Instructor, University of Maryland
5. [Benoit Côté](#) (2015-2018), Data Services Software Engineer, Argonne National Laboratory
6. [Philipp Grete](#) (2016-2021), Marie Skłodowska-Curie Actions Postdoctoral Fellow at the Hamburg Observatory.
7. [Deovrat Prasad](#) (2018-2022), Postdoctoral Research Associate, Cardiff University School of Physics & Astronomy