

BRIAN W. O’SHEA

Professional preparation

University of Illinois, Urbana-Champaign, IL, Engineering Physics (cum laude), B.S., 2000,
University of Illinois, Urbana-Champaign, IL, Physics, M.S., 2001,
University of Illinois, Urbana-Champaign, IL, Physics, PhD, 2005,
Los Alamos National Laboratory, Los Alamos, NM, Theoretical Astrophysics (postdoctoral education; 2005 – 2008)

Appointments

2008-present: Assistant and Associate Professor, Department of Computational Mathematics, Science and Engineering; Department of Physics and Astronomy; and National Superconducting Cyclotron Laboratory, Michigan State University

2005-2008: Director’s Postdoctoral Fellow, Theoretical Astrophysics Group, Los Alamos Nat. Lab.

2005: Graduate Research Assistant, Theoretical Astrophysics Group, Los Alamos Nat. Lab.

2002-2005: Graduate Research Assistant, Lab. for Computational Astrophysics, UC San Diego

Related products and synergistic activities

5 closely related products

1. Côté, B., Silvia, D., O’Shea, B. W., Smith, B., & Wise, J. H. “Validating Semi-Analytic Models of High-Redshift Galaxy Formation using Radiation Hydrodynamical Simulations,” 2017, ApJ, submitted (arXiv:1710.06442)
2. Barrow, K. S. S., Wise, J. H., Norman, M. L., O’Shea, B. W., & Xu, H. “First light: exploring the spectra of high-redshift galaxies in the Renaissance Simulations,” 2016, MNRAS, 469, 4863
3. Xu, H., Wise, J. H., Norman, M. L., Ahn, K., & O’Shea, B. W. “Galaxy Properties and UV Escape Fractions during the Epoch of Reionization: Results from the Renaissance Simulations,” 2016, ApJ, 833, 84
4. O’Shea, B.W., Wise, J.H., Xu, H., & Norman, M.L., “Probing the Ultraviolet Luminosity Function of the Earliest Galaxies with the Renaissance Simulations,” 2015, ApJL, 805, 12
5. Bryan, G. L., Norman, M. L., O’Shea, B. W., et al. “ENZO: An Adaptive Mesh Refinement Code for Astrophysics,” 2014, Ap. J. S., 211, 19

5 other significant products

1. Gomez, F.A., Coleman-Smith, C. E., O’Shea, B. W., Tumlinson, J., & Wolpert, R. L. “Dissecting Galaxy Formation Models with Sensitivity Analysis - a New Approach to Constrain the Milky Way Formation History,” 2014, Ap. J., 787, 20
2. Meece, G. R., Smith, B. D., & O’Shea, B. W. “Fragmentation in Dusty Low-metallicity Star-forming Halos,” 2014, Ap. J., 783, 75

3. Skillman, S.W., Xu, H., Hallman, E.J., O'Shea, B.W., Burns, J.O., Li, H., Collins, D.C., & Norman, M.L., "Cosmological MHD Simulations of Galaxy Cluster Radio Relics: Insights and Warnings for Observations," 2013, Ap. J., 765, 21
4. Turk, M.J., Abel, T., & O'Shea, B.W. 2009, "The Formation of Population III Binaries from Cosmological Initial Conditions," Science, Vol. 395, Issue 5940, pp.601-606
5. O'Shea, B.W. & Norman, M.L. 2007, "Population III Star Formation in a Lambda CDM Universe, I: Effect of Environment on Protostellar Accretion Rates," ApJ, 654, 66-92

Synergistic activities

1. Co-developer of the Enzo AMR cosmology code, organizer of multiple public code releases, and co-organizer of several Enzo User and Developer Workshops.
2. PI of two sequential NSF PRAC grants with a total of 200 million core-hours on the Blue Waters supercomputer (both of which use the Enzo code).
3. Active collaboration with the National Center for Supercomputing Applications scientific visualization group (led by Prof. Donna Cox) to do scientific visualizations for PBS, Discovery Channel, planetarium shows, and the Internet.
4. Co-founder of MSU's Department of Computational Mathematics, Science and Engineering; director of both undergraduate and graduate programs and developer of introductory computational modeling and data analysis courses.
5. Head of effort to create a calculus-based introductory physics sequence, targeted toward life science majors, that utilizes current research on active learning and effective teaching techniques.