Luke F. Roberts

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Department of Physics and Astronomy
Michigan State University
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Professional preparation

Colorado College, Colorado Springs, CO	B.A. in Physics (2006)
University of California Santa Cruz	M.A. in Astronomy & Astrophysics (2009)
University of California Santa Cruz	Ph.D. in Astronomy & Astrophysics (2012)
California Institute of Technology	Postdoctoral Fellow, Astrophysics (08/2012 – 07/2016)

Appointments

Assistant Professor 7/2016 –
National Superconducting Cyclotron Laboratory, Theory Group
Department of Physics and Astronomy
Michigan State University, East Lansing, MI
NASA Einstein Fellow 08/2013 – 07/2016
Lee DuBridge Postdoctoral Fellow 08/2012 – 07/2013

Five publications relevant to the proposal

Roberts, L. F. & Reddy, S., *Charged current neutrino interactions in hot and dense matter*, 2017, Submitted to Physical Review C (arXiv:1612.02764).

Roberts, L. F., Lippuner, J., Duez, M. D., Faber, J. A., F. Foucart, F., Lombardi, J. C., Ning, S., Ott, C. D., and Ponce, M., *The Influence of Neutrinos on r-Process Nucleosynthesis in the Ejecta of Black Hole-Neutron Star Mergers*, 2017, Monthly Notices of the Royal Astronomical Society, 464, 3907.

Roberts, L. F., Ott, C. D., Haas, R., Diener, P., and Schnetter, E., *General Relativistic Three-Dimensional Multi-Group Neutrino Radiation-Hydrodynamics Simulations of Core-Collapse Supernovae*, 2016, The Astrophysical Journal, 831, 98.

Roberts, L. F., Reddy, S., & Shen, G. *Medium modification of the charged-current neutrino opacity and its implications*, 2012, Physical Review C, 86, 065803.

Roberts, L. F., Woosley, S. E., & Hoffman, R. D. *Integrated Nucleosynthesis in Neutrino-driven Winds*, 2010, The Astrophysical Journal, 722, 954.

Five Other Significant Publications

Mösta, P., Ott, C. D., Radice, D., **Roberts, L. F.**, Haas, R., and Schnetter, E., *A large-scale dynamo and magnetoturbulence in rapidly rotating core-collapse supernovae*, 2015, Nature, 528, 376.

Lippuner, J., & **Roberts, L. F.** *r-process Lanthanide Production and Heating Rates in Kilonovae*, 2015, The Astrophysical Journal, 815, 82.

Roberts, L. F., *A New Code for Proto-neutron Star Evolution*, 2012, The Astrophysical Journal, 755, 126.

Roberts, L. F., Shen, G., Cirigliano, V., et al. *Protoneutron Star Cooling with Convection: The Effect of the Symmetry Energy*, 2012, Physical Review Letters, 108, 061103.

Roberts, L. F., Kasen, D., Lee, W. H., & Ramirez-Ruiz, E. *Electromagnetic Transients Powered by Nuclear Decay in the Tidal Tails of Coalescing Compact Binaries*, 2011, The Astrophysical Journal, 736, L21.

Examples of Synergistic Activities

- Organizer, Simulating the Neutrino Sphere with Heavy Ion Collisions, international workshop held in April 2014 at the ECT*, Trento, Italy.
- Developer of `ZelmaniM1` neutrino transport package for the `Cactus` computational framework.
- Reviewer for Nature Communications, Physical Review Letters, The Astrophysical Journal, Physical Review C, Physical Review D, and Monthly Notices of the Royal Astronomical Society.

Collaborators and Co-Editors

Ernazar Abdikamalov (Nazerbaev), Sebastiano Bernuzzi (Parma), Drew Clausen (Industry), Sean Couch (MSU), Peter Diener (LSU), Matt Duez (WSU), Justin Ellis (JPL), Joshua Faber (RIT), Francois Foucart (UC Berkeley), Filippo Galeazzi (Frankfurt am Main), Roland Haas (NCSA), Jeff Kaplan (Industry), Lawrence Kidder (Cornell), Kenta Kiuchi (Kyoto), Hannah Klion (Berkeley), William Lee (UNAM), Jonas Lippuner (Caltech), Jamie Lombardi (Allegheny College), Morgan MacLeod (IAS), Philipp Moesta (Berkeley), Viktoriya Morozova (Princeton), Sandra Ning (Caltech), Evan O'Connor (NCSU), Christian Ott (Caltech), Harald Pfeiffer (Toronto), Anthony Piro (Carnegie), Marcelo Ponce (Guelph), David Radice (Princeton), Enrico Ramirez-Ruiz (UCSC), Sanjay Reddy (Washington), Mathieu Renzo (Amsterdam), Luciano Rezzolla (Frankfurt), Martha Saladino-Rosas (Leiden), Mark Scheel (Caltech), Erik Schnetter (Perimeter), Gang Shen (Industry), Bela Szilagyi (Caltech), Michele Trenti (Melbourne)

Graduate Advisors and Postdoctoral Sponsors

Christian Ott (Caltech), Stan Woosley (UCSC; PhD Advisor)

Graduate Advisees

Jonas Lippuner (Caltech)