Sean Michael Couch – Biographical Sketch

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Professional preparation

Butler University	Indianapolis, IN	Physics	B.S., 2006
University of Texas at Austin	Austin, TX	Astrophysics	M.A., 2008
University of Texas at Austin	Austin, TX	Astrophysics	Ph.D., 2010
University of Chicago (Postdoc)	Chicago, IL	Astrophysics	2010 – 2014
California Institute of Technology (Postdoc)	Pasadena, CA	Astrophysics	2014 – 2015

Appointments

Assistant Professor 6/2015 –
Department of Physics and Astronomy
Department of Computational Mathematics, Science, and Engineering
Facility for Rare Isotope Beams, National Superconducting Cyclotron Laboratory
Joint Institute for Nuclear Astrophysics – Center for the Evolution of the Elements
Michigan State University, East Lansing, MI

Sr. Postdoctoral Scholar 10/2014 – 6/2015
California Institute of Technology, Pasadena, CA

Hubble Fellow 8/2011 – 9/2014
Postdoctoral Scholar 6/2010 – 7/2011
University of Chicago, Chicago, IL

Joint Postdoctoral Appointee 12/2010 – 9/2014
Argonne National Lab/UChicago Computation Institute, Chicago, IL

Five Products Directly Relevant to This Proposal

S.M. Couch, E. Chatzopoulos, W.D. Arnett, F.X. Timmes 2015, *The Three-dimensional Evolution to Core Collapse of a Massive Star*, ApJL, 808, L21

S.M. Couch, C.D. Ott 2015, *The Role of Turbulence in Neutrino-Driven Core-Collapse Supernova Explosions*, ApJ, 799, 5

S.M. Couch, E.P. O'Connor 2014, *High-Resolution Three-Dimensional Simulations of Core-Collapse Supernovae in Multiple Progenitors*, ApJ, 785, 123

S.M. Couch, C.D. Ott 2013, *Revival of The Stalled Core-Collapse Supernova Shock Triggered by Precollapse Asphericity in the Progenitor Star*, ApJL, 778, L7

S.M. Couch 2013, *On the Impact of Three Dimensions in Simulations of Neutrino-Driven Core-Collapse Supernova Explosions*, ApJ, 775, 35

Five Other Significant Products

E.P. O'Connor & **S.M. Couch** 2015, *Two Dimensional Core-Collapse Supernova Explosions Aided by General Relativity with Multidimensional Neutrino Transport*, arXiv:1511.07443

D. Radice, **S.M. Couch**, C.D. Ott 2015, *Implicit large eddy simulations of anisotropic weakly compressible turbulence with application to core-collapse supernovae*, CompAC, 2, 7

S.M. Couch, C. Graziani, N. Flocke 2013, *An Improved Multipole Approximation for Self-gravity and Its Importance for Core-collapse Supernova Simulations*, ApJ, 778, 181

S.M. Couch, J.C. Wheeler, M. Milosavljević 2009, *Aspherical Core-Collapse Supernovae in Red Supergiants Powered by Nonrelativistic Jets*, ApJ, 696, 953

M. Milosavljević, **S.M. Couch**, V. Bromm 2009, *Accretion Onto Intermediate-Mass Black Holes in Dense Proto-*

galactic Clouds, ApJL, 696, L146

Selected Synergistic Activities

- Undergraduate Research Mentor, Michigan State University.
- Lead Organizer, Microphysics in Computational Relativistic Astrophysics (MICRA) 2017 Workshop, East Lansing, MI
- Developer, FLASH open-source simulation framework.

Collaborators and other affiliations

Collaborators and Co-editors

E. Abdikamalov (Nazarbayev University); A. Arcones (Technische Universität Darmstadt); W.D. Arnett (University of Arizona); E. Chatzopoulos (Louisiana State University); A. Christlieb (Michigan State University); D. Clausen (California Institute of Technology); E.P. O'Connor (North Carolina State University); A. Dubey (Argonne National Lab); J. Ellis (California Institute of Technology); N. Flocke (University of Chicago); C. Fröhlich (North Carolina State University); C. Graziani (University of Chicago); R. Haas (National Center for Supercomputing Applications); D.Q. Lamb (University of Chicago); D. Lee (University of California Santa Cruz); M. Milosavljević (University of Texas at Austin); V. Morozova (Princeton University); G.A. Moses (University of Wisconsin); B.W. O'Shea (Michigan State University); C.D. Ott (California Institute of Technology); A.L. Piro (Carnegie Observatories); D. Pooley (Trinity University); D. Radice (Princeton University/Institute for Advanced Study); L.F. Roberts (Michigan State University); D.R. van Rossum (University of Chicago); E. Schnetter (Perimeter Institute for Theoretical Physics); N. Smith (University of Arizona); T.A. Thompson (Ohio State University); F.X. Timmes (Arizona State University); P. Tzeferacos (University of Chicago); J.C. Wheeler (University of Texas at Austin); R.T. Wollaeger (Los Alamos National Lab); M. Zingale (Stony Brook University)

Graduate Advisors and Postdoctoral Sponsors

D.Q. Lamb (University of Chicago); M. Milosavljević (University of Texas at Austin; PhD co-advisor); C.D. Ott (California Institute of Technology); J.C. Wheeler (University of Texas at Austin, PhD advisor)

Postdoctoral Advisees:

M. Warren (Michigan State University); K.-C. Pan (Michigan State University)

Graduate Advisees:

C. Fields (Michigan State University); C. Mattes (TU Darmstadt); J. Ranta (Michigan State University)