

Rebecca A. Surman
Department of Physics
University of Notre Dame
Notre Dame, IN, USA 46656
phone 574.631.6590
email rsurman@nd.edu

Education

Ph.D. Department of Physics and Astronomy, University of North Carolina at Chapel Hill,
July 1998

Thesis: Freezeout and Neutrinos in r -Process Nucleosynthesis

Advisor: Jonathan Engel

M.S. Department of Physics and Astronomy, Michigan State University, May 1995

B.A. *Summa Cum Laude* in Physics, State University of New York College at Geneseo,
May 1993

Experience

Associate Professor University of Notre Dame, 2014-

Professor Union College, 2011-2014

Visiting Associate Professor University of Notre Dame, 2011-2013

Associate Professor Union College, 2005-2011

Visiting Assistant Professor North Carolina State University, 2002-2003, 2008

Assistant Professor Union College, 2000-2005

Visiting Assistant Professor Union College, 1998-2000

Teaching

Stillman Prize for Excellence in Teaching,

Union College campuswide teaching award, received Sept 2007

Courses Taught:

First-year Physics Seminar

Introduction to Astronomy

The Solar System and History of Astronomy

Introductory Physics (Matter in Motion/Electrodynamics)

Integrated Mathematics/Physics

Laboratory for Relativity, Quantum, and their Applications

Intermediate Classical Mechanics

Particle and Nuclear Physics (advanced undergraduate)

Nuclear Physics (second-year graduate)

Publications

“The impact of individual nuclear properties on r -process nucleosynthesis” M. Mumpower, R. Surman, G.C. McLaughlin, and A. Aprahamian, review article submitted to *Progress in Particle and Nuclear Physics* (2015).

“The impact of individual nuclear masses on r -process abundances”, M. Mumpower, R. Surman, D.-L. Fang, M. Beard, P. Möller, T. Kawano, and A. Aprahamian, submitted to *Phys. Rev. C* (2015) [arXiv:1505.07789].

“Symmetric and Standard Matter-Neutrino Resonances Above Merging Compact Objects”, A. Malkus, G.C. McLaughlin, and R. Surman, submitted to *Phys. Rev. D* (2015) [arXiv:1507.00946].

“Variances in r -process predictions from uncertain nuclear rates”, M. Mumpower, R. Surman, and A. Aprahamian, *Journal of Physics: Conference Series* **599**, 012031 (2015).

“The impact of uncertain nuclear masses near closed shells on the r -process abundance pattern”, M. Mumpower, R. Surman, D.-L. Fang, M. Beard, A. Aprahamian, *J. Phys. G Focus Section: Enhancing the interaction between nuclear experiment and theory through information and statistics* **42**, 034027 (2015).

“The Sensitivity of r -Process Nucleosynthesis to Individual β -Delayed Neutron Emission Probabilities”, R. Surman, M. Mumpower, and A. Aprahamian, *JPS Conference Proceedings: Proceedings of the Conference on Advances in Radioactive Isotope Science (ARIS2014)*, 010010 (2015).

“Neutrinos and the synthesis of heavy elements: the role of gravity”, O.L. Caballero, R. Surman, and G.C. McLaughlin, *EPJ Web of Conferences: Proceedings of the Fifteenth International Symposium on Capture Gamma-Ray Spectroscopy and Related Topics (CGS15)* **93**, 03002 (2015).

“The impact of global nuclear mass model uncertainties on r -process abundance predictions”, M. Mumpower, R. Surman, and A. Aprahamian, *EPJ Web of Conferences: Proceedings of the Fifteenth International Symposium on Capture Gamma-Ray Spectroscopy and Related Topics (CGS15)* **93**, 03003 (2015).

“Sensitivity studies for the main r process: nuclear masses”, A. Aprahamian, I. Bentley, M. Mumpower, R. Surman, *AIP Advances* **4**, 041101 (2014).

“Sensitivity studies for the main r process: β -decay rates”, M. Mumpower, J. Cass, G. Passucci, R. Surman, A. Aprahamian, *AIP Advances* **4**, 041009 (2014).

“Sensitivity studies for the weak r process: neutron capture rates”, R. Surman, M. Mumpower, R. Sinclair, K.L. Jones, W.R. Hix, G.C. McLaughlin, *AIP Advances* **4**, 041008 (2014).

“Production of ^{56}Ni in black hole-neutron star merger accretion disk outflows”, R. Surman, O.L. Caballero, G.C. McLaughlin, O. Just, H.-Th. Janka, *J. Phys. G Focus Section: Nucleosynthesis and the neutrino* **41**, 044006 (2014).

“The Influence of Neutrinos on the Nucleosynthesis of Accretion Disk Outflows”, O.L. Caballero, A.C. Malkus, G.C. McLaughlin, R.A. Surman, *J. Phys. G Focus Section: Nucleosynthesis and the neutrino* **41**, 044004 (2014).

“Sensitivity studies for r -process nucleosynthesis in three astrophysical scenarios”, R. Surman, M. Mumpower, J. Cass, I. Bentley, A. Aprahamian, G.C. McLaughlin, *Proceedings of the International Nuclear Physics Conference*, EPJ Web of Conferences **66**, 07024 (2014) [arXiv:1309.0059].

- “Beta-decay study of neutron-rich bromine and krypton isotopes”, K. Miernik, K.P. Rykaczewski, R. Grzywacz, C.J. Gross, D.W. Stracener, J.C. Batchelder, N.T. Brewer, L. Cartegni, A. Fijalkowska, J.H. Hamilton, J.K. Hwang, S.V. Ilyushkin, C. Jost, M. Karny, A. Korgul, W. Królas, S.H. Liu, M. Madurga, C. Mazzocchi, A.J. Mendez II, D. Miller, S.W. Padgett, S.V. Paulauskas, A.V. Ramayya, R. Surman, J.A. Winger, M. Wolińska-Cichočka, E.F. Zganjar, *Phys. Rev. C* **88**, 014309 (2013).
- “The sensitivity of r -process nucleosynthesis to the properties of neutron-rich nuclei”, R. Surman, M.R. Mumpower, J. Cass, A. Aprahamian, *Proceedings of the Fifth International Conference on Fission and Properties of Neutron-Rich Nuclei*, editors J.H. Hamilton and A.V. Ramayya, World Scientific, p. 538-545 (2014) [arXiv:1309.0058].
- “Beta decay and the r process”, J. Cass, G. Passucci, R. Surman, A. Aprahamian, *Proceedings of Science*, **NIC-XII** 154 (2012).
- “The sensitivity of the r -process to nuclear masses”, S. Brett, I. Bentley, N. Paul, R. Surman, A. Aprahamian, *European Physical Journal A* **48**, 184 (2012) [arXiv:1211.7310].
- “Neutrino oscillations above black hole accretion disks: Disks with electron-flavor emission”, A. Malkus, J.P. Kneller, G.C. McLaughlin, R. Surman, *Phys. Rev. D* **86**, 085015 (2012).
- “Influence of neutron capture rates in the rare earth region on the r -process abundance pattern”, M. Mumpower, G.C. McLaughlin, R. Surman, *Phys. Rev. C* **86**, 035803 (2012) [arXiv:1204.0437].
- “The Rare Earth Peak: An Overlooked r -Process Diagnostic”, M. Mumpower, G.C. McLaughlin, R. Surman, *Astrophys. J* **752**, 117 (2012) [arXiv:1202.1758].
- “New half-lives of neutron-rich Zn and Ga isotopes measured with electromagnetic separation”, M. Madurga, R. Surman, I.N. Borzov, R. Grzywacz, K.P. Rykaczewski, C.J. Gross, D. Miller, D.W. Stracener, J.C. Batchelder, N.T. Brewer, L. Cartegni, J.H. Hamilton, J.K. Hwang, S.H. Liu, S.V. Ilyushkin, C. Jost, M. Karny, A. Korgul, W. Królas, A. Kuźniak, C. Mazzocchi, A.J. Mendez II, K. Miernik, S.W. Padgett, S.V. Paulauskas, A.V. Ramayya, J.A. Winger, M. Wolińska-Cichočka, E.F. Zganjar, *Phys. Rev. Lett.* **109**, 112501 (2012).
- “Formation of the Rare Earth Peak: Gaining Insight into Late-time r -Process Dynamics”, M. Mumpower, G.C. McLaughlin, R. Surman, *Phys. Rev. C* **85**, 045801 (2012) [arXiv:1109.3613].
- “Neutrino Spectra from Accretion Disks: Neutrino General Relativistic Effects and the Consequences for Nucleosynthesis”, O.L. Caballero, G.C. McLaughlin, R. Surman, *Astrophys. J.* **745**, 170 (2012) [arXiv:1105.6371].
- “Beta-decay of nuclei around ^{90}Se : Search for signatures of an $N = 56$ sub-shell closure relevant to the r process”, M. Quinn, A. Aprahamian, J. Pereira, R. Surman, O. Arndt, T. Baumann, A. Becerril, T. Elliot, A. Estrade, D. Galaviz, T. Ginter, M. Hausmann, S. Hennrich, R. Kessler, K.-L. Kratz, G. Lorusso, P.F. Mantica, M. Matos, F. Montes, B. Pfeiffer, M. Portillo, H. Schatz, F. Schertz, L. Schnorrenberger, E. Smith, A. Stolz, W.B. Walters, A. Wöhr, *Phys. Rev. C* **85**, 035807 (2012).
- “Neutron capture rates and r -process nucleosynthesis”, R. Surman, M. Mumpower, G.C. McLaughlin, R. Sinclair, W.R. Hix, K.L. Jones, *Proceedings of the 14th International Symposium on Capture Gamma-Ray Spectroscopy and Related Topics*, World Scientific (2011) [arXiv:1309.0057].
- “Nucleosynthesis of Nickel-56 from Gamma-Ray Burst Accretion Disks”, R. Surman, G.C. McLaughlin, N. Sabbatino, *Astrophys. J.* **743**, 155 (2011) [arXiv:1112.2673].
- “The influence of collective neutrino oscillations on a supernova r process”, H. Duan, A. Friedland, G.C. McLaughlin, R. Surman, *J. Phys. G* **38**, 035201 (2011) [arXiv:1012.0532].

- “Neutron capture in the r process”, R. Surman, G.C. McLaughlin, M. Mumpower, W.R. Hix, K. Jones, *Proceedings of Science*, **NIC-XI** 284 (2010).
- “Neutron Capture Rates and the Rare Earth Peak”, M. Mumpower, G.C. McLaughlin, R. Surman, *Proceedings of Science*, **NIC-XI** 273 (2010).
- “Nucleosynthesis from Black Hole Accretion Disks”, G.C. McLaughlin, L. Caballero, R. Surman, *Proceedings of Science*, **NIC-XI** 31 (2010).
- “Gamma-ray burst black hole accretion disks as a site for the νp process”, L.-T. Kizivat, G. Martinez-Pinedo, K. Langanke, R. Surman, G.C. McLaughlin, *Phys. Rev. C* **81**, 025802 (2010).
- “Detecting neutrinos from black hole-neutron star mergers”, O.L. Caballero, G.C. McLaughlin, R. Surman, *Phys. Rev. D* **80**, 123004 (2009) [arXiv:0910.1385].
- “Neutron Capture Rates near $A \sim 130$ which Effect a Global Change to the r -process Abundance Distribution”, R. Surman, J. Beun, G.C. McLaughlin, W.R. Hix, *Phys. Rev. C* **79**, 045809 (2009) [arXiv:0806.3753].
- “Neutron capture on ^{130}Sn during r -process freeze-out”, J. Beun, J.C. Blackmon, W.R. Hix, G.C. McLaughlin, M.S. Smith, R. Surman, *J. Phys. G* **36**, 025201 (2009) [arXiv:0806.3895].
- “ r -Process Nucleosynthesis in Black Hole - Neutron Star Mergers”, R. Surman, G.C. McLaughlin, M. Ruffert, H.-Th. Janka, W.R. Hix, *Proceedings of Science*, **NIC-X** 149 (2008).
- “ r -Process Nucleosynthesis in Hot Accretion Disk Flows from Black Hole-Neutron Star Mergers”, R. Surman, G.C. McLaughlin, M. Ruffert, H.-Th. Janka, W.R. Hix, *Astrophys. J.* **679**, L117 (2008) [arXiv:0803.1785].
- “Fission Cycling in a Supernova r -process”, J. Beun, G.C. McLaughlin, R. Surman, W.R. Hix, *Phys. Rev. C* **77**, 035804 (2008).
- “Nucleosynthesis in Outflows from Kerr Black Hole Accretion Disks”, R. Surman, G.C. McLaughlin, N. Sabbatino[†], W.R. Hix, *First Stars III*, edited by B.W. O’Shea, A. Heger, and T. Abel (2008).
- “The Role of Neutrinos in r -Process Nucleosynthesis in Supernovae and Gamma-ray Bursts”, R. Surman, J. Beun, G.C. McLaughlin, W.R. Hix, S. Kane[†], *J. Phys. G* **35**, 014059 (2007).
- “Supernova Neutrinos: The Accretion Disk Scenario”, G.C. McLaughlin, R. Surman, *Phys. Rev. D* **75**, 023005 (2007) [arXiv:astro-ph/0605281].
- “Element production in the Outflow from Black Hole Accretion Disks”, R. Surman, G.C. McLaughlin, W.R. Hix, *Proceedings of Science*, **NIC-IX** 035 (2006).
- “Neutrinos, Fission Cycling, and the r process”, J. Beun, G.C. McLaughlin, R. Surman, W.R. Hix, *Proceedings of Science*, **NIC-IX** 140 (2006).
- “Nucleosynthesis in the Outflow from Gamma Ray Burst Accretion Disks”, R. Surman, G.C. McLaughlin, W.R. Hix, *Astrophys. J.* **643**, 1057 (2006) [arXiv:astro-ph/0509365].
- “Fission cycling in supernova nucleosynthesis: Active-sterile neutrino oscillations”, J. Beun, G.C. McLaughlin, R. Surman, W.R. Hix, *Phys. Rev. D* **73**, 093007 (2006) [arXiv:hep-ph/0602012].
- “Neutrino Scattering, Absorption, and Annihilation above the accretion disks of Gamma Ray Bursts”, J.P. Kneller, G.C. McLaughlin, R. Surman *J. Phys. G* **32**, 443 (2006).
- “Prospects for obtaining an r process from Gamma Ray Burst Disk Winds”, G.C. McLaughlin, R. Surman, *Nucl. Phys. A* **758**, 189 (2005) [arXiv:astro-ph/0407555].
- “Neutrino Interactions in the Outflow from Gamma-Ray Burst Accretion Disks”, R. Surman, G.C. McLaughlin, *Astrophys. J.* **618**, 397 (2005) [arXiv:astro-ph/0407206].

“On the Contribution of Gamma-Ray Bursts to the Galactic Inventory of Some Intermediate Mass Nuclei”, J. Pruet, R. Surman, G.C. McLaughlin, *Astrophys. J.* **602**, L101 (2004) [arXiv:astro-ph/0309673].

“Neutrinos and Nucleosynthesis in Gamma-Ray Burst Accretion Disks”, R. Surman, G.C. McLaughlin, *Astrophys. J.* **603**, 611 (2004) [arXiv:astro-ph/0308004].

“Changes in r -process abundances in late times”, R. Surman, J. Engel, *Phys. Rev. C* **64**, 035801 (2001) [arXiv:nucl-th/0103049].

“Beta-decay from closed-neutron-shell r -process waiting point nuclei”, J. Engel, M. Bender, J. Dobaczewski, W. Nazarewicz, R. Surman, *Phys. Rev. C* **60**, 014302 (1999) [arXiv:nucl-th/9902059].

“Low energy resonance strengths for proton capture of Mg and Al nuclei”, D.C. Powell, C. Iliadis, A.E. Champagne, S. Hale, V. Hansper, R.A. Surman, K.D. Veal, *Nucl. Phys. A* **644**, 263 (1998).

“Neutrino capture by r -process waiting-point nuclei”, R. Surman, J. Engel, *Phys. Rev. C* **58**, 2526 (1998) [arXiv:nucl-th/9805007].

“Source of the rare-earth element peak in r -process nucleosynthesis”, R. Surman, J. Engel, J. Bennett, B.S. Meyer, *Phys. Rev. Lett.* **79**, 1809 (1997) [arXiv:astro-ph/9701007].

Presentations

“ r -Process abundance pattern variations due to nuclear physics uncertainties”, invited talk, Mazurian Lakes Conference on Physics, Piaski, Poland, September 2015

“Astrophysical alchemy”, CETUP* outreach talk, Black Hills State University, July 2015

“Neutrino interactions and heavy element synthesis”, workshop talk, Institute of Nuclear Theory Program INT-15-2a: Neutrino Astrophysics and Fundamental Properties, University of Washington, Seattle, Washington, June 2015

“Nuclear Reaction Rate Needs for Heavy Element Nucleosynthesis”, workshop talk, Institute of Nuclear Theory Program INT-15-58W: Reactions and Structure of Exotic Nuclei, University of Washington, Seattle, Washington, March 2015

“FRIB and the Origin of the Heavy Elements”, invited talk, 2015 Conference of The National Society of Black Physicists, Baltimore, Maryland, February 2015

“Nuclear physics and the origin of the heaviest elements”, Physics Division seminar, Argonne National Laboratory, October 2014

“Astrophysical alchemy: creating the heaviest elements in the galaxy’s biggest explosions”, invited seminar, Conference Experience for Undergraduates, 4th Joint Meeting of the Divisions of Nuclear Physics of the APS and JPS, Waikoloa, Hawaii, October 2014

“ r -Process Sensitivities to Neutrino and Nuclear Physics”, invited talk, ECT* Workshop on Nuclear Physics and Astrophysics of Neutron-Star Mergers and Supernovae, and the Origin of r -Process Elements, September 2014

“Astrophysical alchemy: heavy element synthesis in supernovae and compact object mergers”, colloquium, Central Michigan University, Mount Pleasant, Michigan, September 2014

“Heavy element synthesis in black hole accretion disk outflows”, invited talk, Nuclei in the Cosmos, Debrecen, Hungary, July 2014

“Sensitivity studies for r -process nucleosynthesis”, invited talk, Advances in Radioactive Isotope Science (ARIS) 2014, Tokyo, Japan, June 2014

“Astrophysical alchemy: creating the heaviest elements in the galaxy’s biggest explosions”, outreach talk, Albany Area Amateur Astronomers, Schenectady, New York, May 2014

“The sensitivity of r -process nucleosynthesis to individual nuclear properties”, invited talk, American Physical Society April Meeting, Savannah, Georgia, April 2014

“ r -Process Nucleosynthesis in GRBs”, invited talk, Workshop on Supernovae and Gamma-Ray Bursts, YITP, Kyoto, Japan, November 2013

“Neutrinos and black hole accretion disk outflow nucleosynthesis”, invited talk, Southeastern Section of the American Physical Society annual meeting, Bowling Green, Kentucky, November 2013

“Neutrinos and heavy element synthesis”, invited talk, Implications of Neutrino Flavor Oscillations (INFO 13) Workshop, Santa Fe, New Mexico, August 2013

“Neutrinos and heavy element synthesis”, invited talk, CETUP* program on Neutrino Physics and Astrophysics, Lead, South Dakota, July 2013

“Nuclear data needs for r -process nucleosynthesis”, invited talk, Gordon Research Conference in Nuclear Chemistry, Colby-Sawyer College, June 2013

“Nuclear data and rapid neutron capture nucleosynthesis”, invited parallel session talk, International Nuclear Physics Conference 2013, Florence, Italy, June 2013

“Nuclear data and the astrophysical site of the r process”, invited talk, 2013 Canadian Association of Physicists Congress, Montreal, Quebec, May 2013

“Neutrinos and nucleosynthesis in supernovae and collapsars”, invited talk, Fifty-one Ergs Supernova Workshop, North Carolina State University, May 2013

“The sensitivity of r -process nucleosynthesis to beta-delayed neutron emission probabilities”, invited talk, North American Workshop on Beta-delayed Neutron Emission, Oak Ridge National Laboratory, May 2013

“Nuclear data and the astrophysical site of the r process”, invited talk, International Workshop XLI on Gross Properties of Nuclei and Nuclear Excitations, Hirschegg, Austria, January 2013

“The sensitivity of r -process nucleosynthesis to the properties of neutron-rich nuclei”, invited talk, 5th International Conference on Fission and Properties of Neutron-rich Nuclei, Sanibel Island, Florida, November 2012

“Sensitivity of the r -process to individual β decay rates”, contributed talk, APS Division of Nuclear Physics Fall Meeting, Newport Beach, CA, October 2012

“Open questions in r -process and νp -process nucleosynthesis”, invited review talk, Nuclear Astrophysics Town Meeting, Detroit, MI, October 2012

“Neutrino and nuclear physics in the astrophysical synthesis of the heaviest elements”, colloquium, Department of Physics, University of Notre Dame, August 2012

“The Rare Earth Peak: an overlooked r -process diagnostic”, workshop talk, INT 12-2a Core Collapse Supernovae: Models and Observable Signals, Institute of Nuclear Theory, University of Washington, July 2012

“Nuclear data for r -process nucleosynthesis”, nuclear physics seminar, Oak Ridge National Laboratory, April 2012

“Nuclear data for r -process models”, Joint Institute for Nuclear Astrophysics webinar, University of Notre Dame, April 2012

“Nuclear data for r -process nucleosynthesis”, nuclear physics seminar, National Superconducting Cyclotron Laboratory, Michigan State University, November 2011

“Neutrinos and Nucleosynthesis”, invited talk, Frontiers in Neutrino Physics, AstroParticule et Cosmologie, Paris, France, October 2011

“Heavy element synthesis in supernovae and gamma-ray bursts”, colloquium, Department of Physics, Florida State University, September 2011

“The nuclear physics of r -process nucleosynthesis”, nuclear physics seminar, Department of Physics, Florida State University, September 2011

“Sterile Neutrinos and Supernova Nucleosynthesis”, invited talk, Sterile Neutrinos at the Crossroads 2011, Center for Neutrino Physics, Virginia Tech, September 2011

“Neutron capture rates and r -process nucleosynthesis”, invited talk, CGS14: 14th International Symposium on Capture Gamma-Ray Spectroscopy and Related Topics, Guelph, Canada, August 2011

“Beta decay rates and r -process nucleosynthesis”, invited contribution, Joint ATLAS-HRIBF-NSCL-FRIB Users Meeting, National Superconducting Cyclotron Laboratory, Michigan State University, August 2011

“Neutrino oscillations and supernova nucleosynthesis”, invited talk, HANSE 2011: Hamburg Neutrinos from Supernova Explosions, DESY, Germany, July 2011

“Nuclear data and r -process nucleosynthesis”, invited talk, Workshop on “Decay Spectroscopy at CARIBU: Advanced Fuel Cycle Applications, Nuclear Structure, and Astrophysics”, Argonne National Laboratory, April 2011

“Heavy element synthesis in supernovae and gamma-ray bursts”, colloquium, Department of Astronomy, University of Illinois, March 2011

“Neutrinos and the r -process in hot astrophysical environments”, nuclear physics seminar, University of Notre Dame, March 2011

“Heavy element synthesis in supernovae and gamma-ray bursts”, astrophysics colloquium, Rochester Institute of Technology, March 2011

“Topics in Nuclear Astrophysics”, invited lecturer for five lectures at the Norwegian Centre for International Cooperation in Higher Education/Michigan State University/University of Oslo Nuclear Physics Winter School, Michigan State University, January 3-7, 2011

“Astrophysical Alchemy: Creating the heaviest elements within the galaxy’s biggest explosions”, colloquium, Hamilton College, January 2011

“Modeling r -Process Nucleosynthesis in Hot Astrophysical Flows”, invited talk, American Physical Society Division of Nuclear Physics Fall Meeting, Santa Fe, NM, November 2010

“Astrophysical Alchemy: Creating the heaviest elements within the galaxy’s biggest explosions”, astrophysics seminar, Rensselaer Polytechnic Institute, and colloquium, Union College, September 2010

“Neutrinos and Nucleosynthesis”, invited talk, NOW 2010 Neutrino Oscillations Workshop, Conca Specchiulla, Italy, September 2010

“Neutron capture and the r process”, invited talk, EMMI Workshop *Neutron Matter in Astrophysics: From Neutron Stars to the r Process*, GSI, Darmstadt, Germany, July 2010

“Nucleosynthesis in extreme astrophysical environments”, nuclear physics seminar, Rutgers University, April 2010

“Nuclear data and r -process nucleosynthesis”, nuclear physics seminar, University of Tennessee, Knoxville, March 2010

“Nucleosynthesis of Nickel-56 from Gamma-Ray Burst Accretion Disks”, contributed talk, American Physical Society Division of Nuclear Physics Fall Meeting, Waikoloa, Hawaii, October 2009

“Nuclear data and r -process nucleosynthesis”, invited talk, COMEX3, Third International Conference on “Collective Motion in Nuclei under Extreme Conditions”, Mackinac Island, MI, June 2009

“The Astrophysics and Nuclear Physics of r -Process Nucleosynthesis”, seminar, TRIUMF National Laboratory, Vancouver, Canada, October 2008

“Neutron Capture and the Site of the r Process”, seminar, National Superconducting Cyclotron Laboratory, Michigan State University, September 2008

“ r -Process Nucleosynthesis in Black Hole-Neutron Star Mergers”, contributed poster, Nuclei in the Cosmos X, Mackinac Island, MI, July 2008

“Aspects of the Astrophysics and Nuclear Physics of r -Process Nucleosynthesis”, invited talk, Workshop on Statistical Nuclear Physics and Applications in Astrophysics and Technology, Ohio University, Athens, OH, July 2008

“Neutrinos from Black Hole Accretion Disks”, astrophysics seminar, North Carolina State University, May 2008

“Neutrinos from Black Hole Accretion Disks”, high energy physics seminar, Duke University, April 2008

“Neutrinos from Black Hole-Neutron Star Mergers”, contributed talk, April Meeting of the American Physical Society, St. Louis, April 2008

“The Nuclear Physics of Black Hole Accretion Disks and Outflows”, invited talk, ECT* Workshop on Exotic Modes of Excitation: from Nuclear Structure to Astrophysics, Trento, Italy, October 2007

“Nucleosynthesis in Outflows from Collapsar Accretion Disks”, contributed poster, First Stars III, Santa Fe, NM, July 2007

“Neutrinos from Black Hole Accretion Disks”, invited talk, Santa Fe Summer Workshop on Implications of Neutrino Flavor Oscillations, Santa Fe, NM, July 2007

“Heavy Element Synthesis from Black Hole Accretion Disks”, contributed talk, April Meeting of the American Physical Society, Jacksonville, FL, April 2007

“The Ashes of Gamma-Ray Bursts”, colloquium, Department of Physics and Astronomy, Bucknell University, April 2007

“The Role of Neutrinos in Supernovae and Gamma-Ray Bursts”, invited talk, Nuclear Physics in Astrophysics III, Dresden, Germany, March 2007

“Gamma-Ray Bursts: Neutrinos and Nucleosynthesis”, nuclear physics seminar, Institute of Nuclear and Particle Physics, Ohio University, October 2006

“Neutrinos and Nucleosynthesis in Gamma-Ray Bursts”, contributed plenary talk, Nuclei in the Cosmos IX, Geneva, Switzerland, June 2006

“Nucleosynthesis from Black Hole Accretion Disks”, seminar, Kavli Institute of Theoretical Physics, *The Supernova Gamma-Ray Burst Connection*, University of California - Santa Barbara, March 2006

“The Ashes of Gamma-Ray Bursts”, Conference Experience for Undergraduates Seminar, American Physical Society Division of Nuclear Physics Fall Meeting, Maui, Hawaii, September 2005

“Neutrinos and Nucleosynthesis in Supernovae and Gamma-Ray Bursts”, Institute of Nuclear Theory Program 05-2a - Underground Science, University of Washington, July 2005

“Nucleosynthesis in Gamma-Ray Bursts”, invited talk, American Physical Society April Meeting, Tampa, FL, April 2005

“Neutrinos and Nucleosynthesis in Gamma-Ray Burst Accretion Disks and Outflows”, The Supernova-Gamma Ray Burst Connection workshop, Institute of Nuclear Theory, University of Washington, July 2004

“Supernovae and the Dynamical r Process”, Nuclear and Particle Physics seminar, Rensselaer Polytechnic Institute, November 1999

“Neutrinos and the Formation of Heavy Elements”, invited talk, Astronomical Society of New York Spring Meeting, April 1999

“Neutrino Interactions from Neutron-Rich Nuclei”, contributed talk, American Physical Society Division of Nuclear Physics Fall Meeting, Whistler, BC, October 1997

“Formation of Rare-Earth Nuclei in r -Process Nucleosynthesis”, contributed talk, Southeastern Section of the APS Fall Meeting, Decatur, GA, November 1996

Grants

“Neutrinos and Nucleosynthesis in Gamma-Ray Bursts”, Single P.I. grant

Department of Energy Office of Science

2005-2007, \$55k

2007-2010, \$96k

2010-2013, \$99k

2013-2016, \$102k

Subcontract of the Outstanding Junior Investigator award of Katherine L. Grzywacz-Jones, “Spectroscopic Studies Close to ^{100}Sn and ^{132}Sn Using Direct Reactions and Gamma-Ray Measurements”, 2009-2011, \$50k

“Heavy element synthesis in outflows from gamma-ray burst accretion disks”

Research Corporation Cottrell College Science Award, 2004-2006, \$21k

Service

American Physical Society Division of Nuclear Physics Program Committee, 2013-2015

Graduate Recruitment Committee, University of Notre Dame, 2014-

Undergraduate Curriculum Committee, University of Notre Dame, 2014-

Chair, Department of Physics and Astronomy Search Committee, Union College, 2013-2014

Chair, ad-hoc tenure committee, Union College, Fall 2013

Committee on Teaching, Union College, 2008-2011

Chair, Physics and Astronomy Assessment Committee, Union College, 2007-2011

Chair, ad-hoc tenure committee, Union College, Fall 2009

Ad-hoc tenure committee, Union College, Fall 2005

Center II junior representative, Faculty Review Board, Union College, 2003-2004

Society of Physics Students/ $\Sigma\Pi\Sigma$ National Physics Honor Society advisor, Union College, 2003-2007

Department of Physics and Astronomy Search Committees, Union College, 2001-2011

Department of Physics and Astronomy Curriculum Committee, Union College, 1998-2011

Other

Member, American Physical Society (Division of Nuclear Physics, Division of Astrophysics)

Reviewed journal articles for

- *The Astrophysical Journal*
- *The Astrophysical Journal Letters*
- *Journal of Physics G: Nuclear and Particle Physics*
- *Journal of Applied Physics*
- *Monthly Notices of the Royal Astronomical Society*
- *New Astronomy*
- *Physics Letters B*

Reviewed grant proposals for

- The Department of Energy Office of Science
- The National Science Foundation
- Research Corporation