

KELLY M. PATTON

EDUCATION

- 2014 PhD. in Physics, North Carolina State University, Raleigh, NC
- 2008 B.A. in Physics, Summa Cum Laude, The College of Wooster, Wooster, OH

EMPLOYMENT HISTORY

- 2021 - present Assistant Professor
 Department of Physics
 Trinity College
 Hartford, CT
- 2019 - 2021 Faculty Fellow
 Department of Physics and Astronomy
 Colby College
 Waterville, ME
- 2016 - 2019 Research Associate
 University of Washington
 Institute for Nuclear Theory
 Seattle, WA
- 2014 - 2016 Postdoctoral Research Associate
 Arizona State University
 Physics Department
 Tempe, AZ

ARTICLES IN REFEREED JOURNALS

1. Ebraheem Farag, F.X. Timmes, Morgan Taylor, **Kelly M. Patton**, R. Farmer “On Stellar Evolution In A Neutrino Hertzsprung-Russell Diagram”, *Astrophys. J.* **893** 133 (2020) [arXiv:2003.05844](https://arxiv.org/abs/2003.05844)
2. **K. M. Patton**, C. Lunardini, R. J. Farmer, and F. X. Timmes “Neutrinos from beta processes in a presupernova: probing the isotopic evolution of a massive star”, *Astrophys. J.* **851** 6 (2017) [arXiv:1709.01877](https://arxiv.org/abs/1709.01877)
3. **K. M. Patton**, C. Lunardini, and R. J. Farmer “Presupernova Neutrinos: Realistic Emissivities from Stellar Evolution”, *Astrophys. J.* **840** 2 (2017) [arXiv:1511.028020](https://arxiv.org/abs/1511.028020)
4. **K. M. Patton**, J. P. Kneller and G. C. McLaughlin “Stimulated neutrino transformation through turbulence on a changing density profile and application to supernovae”, *Phys. Rev. D* **91**, 025001 (2015) [arXiv:1407.7835](https://arxiv.org/abs/1407.7835)
5. **K. M. Patton**, J. P. Kneller and G. C. McLaughlin “Stimulated Neutrino Transformation Through Turbulence”, *Phys. Rev. D* **89**, 073022 (2014) [arXiv:1310.5643](https://arxiv.org/abs/1310.5643)
6. **K. M. Patton**, G. C. McLaughlin and K. Scholberg “Prospects for using coherent elastic neutrino-nucleus scattering to measure the nuclear neutron form factor”, *Int. J. Mod. Phys. E* **22** 1330013 (2013).
7. J. P. Kneller, G. C. McLaughlin and **K. M. Patton**, “Stimulated Neutrino Transformation with Sinusoidal Density Profiles”, *J. Phys. G* **40**, 055002 (2013). [arXiv:1202.0776](https://arxiv.org/abs/1202.0776)

8. **K. M. Patton**, J. Engel, G. C. McLaughlin and N. Schunck, “Neutrino-nucleus coherent scattering as a probe of neutron density distributions”, *Phys. Rev. C* **86**, 024612 (2012). [arXiv:1207.0693](https://arxiv.org/abs/1207.0693)
9. A. Huff, **K. M. Patton**, H. Odhner, D. T. Jacobs, B. C. Clover and S. C. Greer, “Micellization and phase separation for triblock copolymer 17R4 in H₂O and in D₂O”, *Langmuir* **27**, 1707 (2011).
10. J. F. Lindner, **K. M. Patton**, P. M. Odenthal, J. C. Gallagher and B. J. Breen, “Experimental observation of soliton propagation and annihilation in a hydromechanical array of one-way coupled oscillators”, *Phys. Rev. E* **78**, 066604 (2008).

HONORS AND AWARDS

2010-2013	GAANN Fellowship in Nuclear Science and Engineering North Carolina State University
2008	The Jonas O. Notestein Prize, The College of Wooster
2008	The Arthur H. Compton Prize in Physics, The College of Wooster
2007	Phi Beta Kappa, The College of Wooster

INVITED TALKS

2018	“Neutrinos from Beta Processes in Presupernovae” 2018 JINA-CEE Frontiers in Nuclear Astrophysics, South Bend, IN 23-25 May 2018
2018	“Neutrinos from Pre-Collapse Massive Stars” N3AS Collaboration Meeting, San Diego, CA 11-12 January 2018
2017	“CE ν NS as a Probe of Nuclear Neutron Density Distributions” ν ECLIPSE, Knoxville, TN 20-22 July 2017
2017	“Presupernova Neutrinos: Realistic Emissivities from Stellar Evolution” Fifty-One Erg 2017, Corvallis, OR 5-8 June 2017
2013	“Stimulated Neutrino Transformation With Multiple Sinusoidal Potentials” Southeast Section of APS 2013, Bowling Green, KY 20-23 November 2013
2013	“Neutrino-nucleus coherent scattering as a probe of nuclear neutron density distributions” NANPino-2013, Valday, Russia 24-29 June 2013
2013	“Neutrino-Nucleus Coherent Scattering as a Probe of Nuclear Neutron Density Distributions” Aspen Winter Workshop - New Directions in Neutrino Physics 2013, Aspen, CO 3-9 February 2013
2012	“Neutrino-Nucleus Coherent Scattering as a Probe of Nuclear Neutron Density Distributions” Workshop on Neutrinos at the Spallation Neutron Source 2012, Oak Ridge, TN 3-4 May 2012

CONTRIBUTED TALKS

- 2018 “CE ν NS as a Probe of Nuclear Neutron Form Factors”
Magnificent CE ν NS, Chicago, IL
2-3 November 2018
- 2018 “Neutrinos from Beta Processes in Presupernovae”
Conference on the Intersections of Particle and Nuclear Physics, Palm Springs, CA
29 May - 3 June 2018
- 2017 “Presupernova Neutrinos: Realistic Emissivities from Stellar Evolution”
APS April Meeting 2017, Washington D. C.
28-31 January 2017
- 2017 “Prospects for using coherent elastic neutrino-nucleus scattering to measure the nuclear neutron form factor”
APS April Meeting 2017, Washington, D. C.
28-31 January 2017
- 2015 “Presupernova Neutrino Spectra”
Institute for Nuclear Theory Program 15-2A - Neutrino Astrophysics and Fundamental Properties 2015, Seattle, WA
1-26 June 2015
- 2013 “Nuclear Form Factors and Stimulated Transition”
INFO13, Santa Fe, NM
26-30 August 2013
- 2013 “Prospects for Using Coherent Elastic Neutrino-Nucleus Scattering to Measure the Nuclear Neutron Form Factor”
APS-Division of Nuclear Physics Meeting 2013, Newport News, VA
23-26 October 2013
- 2011 “Neutrino-nucleus coherent scattering as a probe of neutron density distributions”
APS-Division of Nuclear Physics Meeting 2011, East Lansing, MI
26-29 October 2011

TEACHING AND MENTORING EXPERIENCE

- 2019-2020 Instructor - PH431 Quantum Mechanics, Colby College
- 2019-2020 Instructor - PH311 Classical Mechanics, Colby College
- 2019 Instructor - PH397 Topics in Theoretical Physics (Nuclear Astrophysics)
Colby College
- 2019-2020 Lab Instructor - PH141 Foundations of Mechanics, Colby College
- 2019-2020 Lab Instructor - PH143 Honors Physics, Colby College
- 2019-2020 Lab Instructor - PH145 Foundations of Electromagnetism, Colby College
- 2019-2020 Research Mentor - Senior Honors Thesis - Hongyong Zhang
“Effects of Energy Resolution and Bin Size on the Measurements of Nuclear Neutron Distributions Using Coherent Elastic Neutrino-Nucleus Scattering”
- 2020-2021 Research Mentor - Senior Honors Thesis - Shannon Gray
“Sterile Neutrino Oscillations in Turbulence”

- 2020-2021 Independent Study Mentor - Topics in Quantum Field Theory
- 2008-2010 Teaching Assistant - Physics for Scientists and Engineers II Laboratory
North Carolina State University

SERVICE TO PROFESSION

- 2019 JINA Frontiers Conference 2019 Organizing Committee Member
- 2019 Organizer and Diversity Coordinator- INT workshop "Weak Elastic Scattering with Nuclei"

Referee for *Physical Review D*, *Astrophysical Journal*, *Monthly Notices of the Royal Astronomical Society*

MEDIA COVERAGE

- 2018 "Capturing Neutrinos From a Star's Final Hours"
by Kerry Hensley, AAS Nova, 20 April 2018
<https://aasnova.org/2018/04/20/capturing-neutrinos-from-a-stars-final-hours>

PROFESSIONAL AFFILIATIONS

American Physical Society