

Richard Leigh Longland

Nuclear Astrophysicist

421 Riddick Hall
Campus Box 8202
Raleigh, NC 27695-8202
Telephone: (919) 515-3398
E-mail: richard_longland@ncsu.edu

Professional Experience

North Carolina State University, Raleigh, North Carolina
Associate Professor of Physics
Assistant Professor

August 2020 – Present
August 2014 – August 2020

University of North Carolina at Chapel Hill, Chapel Hill, North Carolina
Postdoctoral Researcher

August 2013 – August 2014

- Upgrading nucleosynthesis codes to improve efficiency by up to a factor of 100
- Advising graduate students on research projects and training them in analysis techniques
- Extending Monte Carlo nucleosynthesis models and developing data management tools

Universitat Politècnica de Catalunya (UPC), Barcelona, Spain
Postdoctoral Researcher

September 2010 – July 2013

- Modernized post-processing nucleosynthesis codes to improve stability and efficiency
- Developed methods for mapping white dwarf abundance patterns onto Smooth Particle Hydrodynamics (SPH) simulations to model white dwarf merger nucleosynthesis
- Developed and performed experiments to measure nuclear properties by α -particle transfer
- Collaborated on international experiments to determine the properties of nuclei important for nova and x-ray burst nucleosynthesis
- Contributed expertise towards the development of the Canfranc Underground Nuclear Astrophysics Laboratory, Canfranc Estación, Spain

Tesla Engineering Ltd., Storrington, UK
Scientist

May – September 2004

- Developed Magnetic Resonance Imaging (MRI) gradient coil design software
- Developed and implemented training record database
- Analyzed quadrupole magnet fields with specialized equipment

Intern

May – August 2002 & 2001

- Added user interface to MRI gradient coil modeling software
- Assisted with code upgrades to coil modeling software

Education

Ph.D. Physics

December 2006 – May 2010

The University of North Carolina at Chapel Hill (UNC), Chapel Hill, North Carolina

Dissertation: "Investigation of the s-Process Neutron Source $^{22}\text{Ne}+\alpha$ "

I reduced the reaction rate uncertainties for the $^{22}\text{Ne}+\alpha$ reactions by a factor of 100 by performing a nuclear resonance fluorescence experiment at the High Intensity γ -ray Source facility. Additionally, I developed a novel method of extracting ^{22}Ne concentrations in targets that involved implementing complex deconvolution routines to fit yield data, resulting in the most precise low-energy $^{22}\text{Ne}(p,\gamma)^{23}\text{Na}$ resonance strength to date. To analyze both experiments, I utilized extensive detector response modeling in Geant4 and developed a Monte Carlo reaction rate code that was a first for calculating statistically-realistic rate uncertainties.

M.S. Physics

September 2004 – December 2006

The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina

Thesis: "The γ -ray Detection System at the Laboratory for Experimental Nuclear Astrophysics"

This project involved characterization of the detection system at the Laboratory for Experimental Nuclear Astrophysics (LENA) at the Triangle Universities Nuclear Laboratory. By exploring coincidence detection schemes, I obtained high background suppression of a factor of 3000, thus greatly increasing the sensitivity for measuring small reaction cross-sections.

Master in Physics (Physics with Satellite Technology)

September 2000 – May 2004

The University of Surrey, Guildford, UK

Degree awarded with First Class Honors

This program included a one-year independent research project at UNC designing, building, and characterizing a cosmic muon veto shield for the LENA γ -ray detection system. The shield utilized a novel wavelength shifting fiber readout system to reduce detector footprint and improve operating lifetime.

Additional Training

2014 New Faculty Workshop

College Park, Maryland

23 – 26 June 2014

2009 National Nuclear Physics Summer School

Michigan State University, East Lansing, Michigan

28 June – 10 July 2009

Asymptotic Giant Branch (AGB) star modeling

with John Lattanzio. Monash University, Clayton, Victoria, Australia

12 August – 9 September 2007

Geant4 Tutorial

Jefferson Laboratory, Newport News, Virginia

22 – 26 May 2006

Affiliations and Awards

- US Department of Energy Early Career Award, 2017
- Awarded travel grant for invited talk at APS April Meeting, 2013
- Awarded ESF EUROCORES program, EuroGENESIS funding, 2010 - 2013
- Awarded travel grant for Nuclei in the Cosmos meeting, 2012
- Member of the European Physical Society since 2011
- Member of the American Physical Society since 2004
- Awarded the Agilent Technologies Master in Physics Prize for best overall performance of undergraduates in Physics, 2004

Skills Summary

Laboratory Experience

- Spectrometer systems
 - Enge split-pole spectrograph at the Triangle Universities Nuclear Laboratory, North Carolina
 - Enge Splitpole at Yale University, New Haven, Connecticut, and at the Institut de Physique Nucléaire, Orsay, France
 - Quadrupole-Dipole-Dipole-Dipole (Q3D) at Maier-Leibnitz-Laboratorium, Technische Universität München, Munich, Germany
- γ -ray detection systems
 - Germanium detectors for γ -ray spectroscopy
 - Segmented NaI(Tl) Annulus for use in $\gamma\gamma$ -coincidence systems
 - Plastic scintillators for muon shields - built and characterized detectors
- Accelerator systems
 - High Intensity γ -ray Source
 - 1 MV Van deGraff Accelerator - upgraded from proton beam to α -particle beam capability
 - 200 kV Eaton ion implanter - repaired the inoperable system
- Target fabrication using ion implantation
- High vacuum and gas handling systems, including operation of leak test equipment
- Quadrupole magnet field analyzing equipment
- NIM-based electronics
- VME data acquisition systems
- Equipment design, including a vacuum leak test station, detector stands, and beam apertures

Teaching & Mentoring Skills

- Directly supervised 6 graduate students (two graduated)
- Supervised 7 NCSU undergraduate students and 7 Research Experiences for Undergraduates (REU)
- Trained one UPC and 5 UNC graduate students in hardware operation and software analysis techniques
- Lab instructor for non-calculus and calculus-based physics, Fall 2004 – Spring 2006
- One-on-one tutoring at the UNC Physics Tutorial Center, 2004 – 2005
- Judge for science fairs at high school level in physics and engineering, including at the North Carolina Student Academy of Science and the North Carolina State Science Fair

Computing & Analysis Skills

- Post-processing nucleosynthesis calculations
- SPH stellar modeling codes
- Parallel-computing systems using the Sun Grid Engine
- Familiarity with Monash AGB star hydrodynamics and nucleosynthesis codes: MONSTAR, MONSOON
- VME Firmware coding experience
- Edited MRI scanner modeling codes
- Physics software: SRIM, root, Geant4
- Mathematical software: R, gnuplot, Mathematica, Gnu Scientific Library
- Programming languages: FORTRAN, C, C++, Java, bash
- Desktop computing: OpenOffice, L^AT_EX, MSOffice, Autodesk Inventor (CAD)

Selected Computer Codes Authored

- Monte Carlo nuclear reaction rate error propagation code, available for public use online
- Geant4 Monte Carlo codes of detector systems
- Suite of coincidence summing correction codes for spectroscopy, used by researchers at LENA and at Los Alamos National Laboratory, Los Alamos, New Mexico
- Spectrum analysis code utilizing Bayesian statistics for uncertainty determination
- Thick target yield curve fitting using Markov-Chain Monte Carlo parameter estimation
- Efficient nucleosynthesis post-processing codes coupled with automated analysis and parallel processing used at UNC and UPC

Publications

Refereed Journal Articles

- [51] D. S. Harrouz, N. de Séréville, P. Adsley, F. Hammache, **R. Longland**, B. Bastin, T. Faestermann, R. Hertenberger, M. La Cognata, L. Lamia, A. Meyer, S. Palmerini, R. G. Pizzone, S. Romano, A. Tumino, and H. F. Wirth, *Experimental study of the $^{30}\text{Si}(\beta\text{He},d)^{31}\text{P}$ reaction and thermonuclear reaction rate of $^{30}\text{Si}(p,\gamma)^{31}\text{P}$* , Phys. Rev. C **105** (2022) 015805.
- [50] C. Marshall, K. Setoodehnia, F. Portillo, J. H. Kelley, and **R. Longland**, *New energy for the 133-keV resonance in the $^{23}\text{Na}(p,\gamma)^{24}\text{Mg}$ reaction and its impact on nucleosynthesis in globular clusters*, Phys. Rev. C **104** (2021) L032801.
- [49] **R. Longland** and N. de Séréville, *Correlated energy uncertainties in reaction rate calculations*, A&A **642** (2020) A41.
- [48] A. Meyer, N. de Séréville, A. M. Laird, F. Hammache, **R. Longland**, T. Lawson, M. Pignatari, L. Audouin, D. Beaumel, S. Fortier, J. Kiener, A. Lefebvre-Schuhl, M. G. Pellegriti, M. Stanoiu, and V. Tatischeff, *Evaluation of the $^{13}\text{N}(\alpha,p)^{16}\text{O}$ thermonuclear reaction rate and its impact on the isotopic composition of supernova grains*, Phys. Rev. C **102** (2020) 035803.
- [47] C. Marshall, P. Morfouace, N. de Séréville, and **R. Longland**, *Bayesian analysis of the $^{70}\text{Zn}(d,^3\text{He})^{69}\text{Cu}$ transfer reaction*, Phys. Rev. C **102** (2020) 024609.
- [46] W. A. Richter, B. A. Brown, textbfR. Longland, C. Wrede, P. Denissenkov, C. Fry, F. Herwig, D. Kurtulgil, M. Pignatari, and R. Reifarth, *Shell-model studies of the astrophysical $r p$ -process reactions $^{34}\text{S}(p,\gamma)^{35}\text{Cl}$ and $^{34g,m}\text{Cl}(p,\gamma)^{35}\text{Ar}$* , Phys. Rev. C **102** (2020) 025801.
- [45] J. Dermigny, C. Iliadis, A. Champagne, and **R. Longland**, *Thermonuclear reaction rate of $^{30}\text{Si}(p,\gamma)^{31}\text{P}$* , Phys. Rev. C **102** (2020) 014609.
- [44] C. B. Hamill, P. J. Woods, D. Kahl, **R. Longland**, J. P. Greene, C. Marshall, F. Portillo, and K. Setoodehnia, *Study of the $^{25}\text{Mg}(d,p)^{26}\text{Mg}$ reaction to constrain the $^{25}\text{Al}(p,\gamma)^{26}\text{Si}$ resonant reaction rates in nova burning conditions*, European Physical Journal A **56** (2020) 36.
- [43] K. Setoodehnia, J. H. Kelley, C. Marshall, F. Portillo Chaves, and **R. Longland**, *Experimental study of ^{35}Cl excited states via $^{32}\text{S}(\alpha,p)$* , Phys. Rev. C **99** (2019) 055812.
- [42] C. Marshall, K. Setoodehnia, K. Kowal, F. Portillo, A. E. Champagne, S. Hale, A. Dummer, and **R. Longland**, *The focal-plane detector package on the tunl split-pole spectrograph*, IEEE Transactions on Instrumentation and Measurement **68** (2019) 533–546.
- [41] K. Setoodehnia, C. Marshall, J. H. Kelley, J. Liang, F. Portillo Chaves, and **R. Longland**, *Excited states of ^{39}Ca and their significance in nova nucleosynthesis*, Phys. Rev. C **98** (2018) 055804.
- [40] D. Martin, J. José, and **R. Longland**, *On the parallelization of stellar evolution codes*, Computational Astrophysics and Cosmology **5** (2018) 3.
- [39] **R. Longland**, J. Dermigny, and C. Marshall, *Reaction rates for the $^{39}\text{K}(p,\gamma)^{40}\text{Ca}$ reaction*, Phys. Rev. C **98** (2018) 025802.
- [38] S. Manwell, A. Parikh, A. A. Chen, N. de Séréville, P. Adsley, D. Irvine, F. Hammache, I. Stefan, **R. Longland**, J. Tomlinson, P. Morfuace, and B. Le Crom, *Effectiveness of using a magnetic spectrograph with the Trojan Horse method*, in *Journal of Physics Conference Series*, vol. 940 of *Journal of Physics Conference Series*, p. 012046, Jan., 2018.
- [37] **R. Longland**, *Correlated uncertainties in Monte Carlo reaction rate calculations*, Astron. Astrophys. **604** (2017) A34.
- [36] S. Hunt, C. Iliadis, and **R. Longland**, *Characterization of a ^{10}B -doped liquid scintillator as a capture-gated neutron spectrometer*, Nucl. Instr. and Meth. A **811** (2016) 108–114.
- [35] C. T. Nsangu, A. M. Laird, A. Parikh, P. Adsley, M. D. Birch, A. A. Chen, T. Faestermann, S. P. Fox, B. R. Fulton, R. Hertenberger, D. Irvine, B. P. Kay, **R. Longland**, S. Manwell, A. S. J. Murphy, K. Schmitt, N. de Séréville, J. R. Tomlinson, and H.-F. Wirth, *The $^{20}\text{Ne}(d,p)^{21}\text{Ne}$ transfer reaction in relation to the s -process abundances*, J. of Phys. Conf. Ser. **665** (2016) 012026.
- [34] J. L. Tain, D. Jordán, J. Agramunt, A. Algora, I. Bandac, A. Bettini, R. Caballero-Folch, F. Calviño, D. Cano-Ott, G. Cortés, C. Domingo-Pardo, L. M. Fraile, A. R. García, J. J. Gomez-Cadenas, J. José, **R. Longland**, E. Mendoza, and A. Parikh, *Measurement of very low (α,n) cross sections of astrophysical interest*, J. of Phys. Conf. Ser. **665** (2016) 012031.
- [33] A. Coc, P. Petitjean, J.-P. Uzan, E. Vangioni, P. Descouvemont, C. Iliadis, and **R. Longland**, *New reaction rates for improved primordial D/H calculation and the cosmic evolution of deuterium*, Phys. Rev. D **92** (2015) 123526.

- [32] K. J. Kelly, A. E. Champagne, **R. Longland**, and M. Q. Buckner, *New recommended $\omega \gamma$ for the $E_r^{c.m.}=458$ keV resonance in $^{22}\text{Ne}(p, \gamma)^{23}\text{Na}$* , Phys. Rev. C **92** (2015) 035805.
- [31] M. Q. Buckner, C. Iliadis, K. J. Kelly, L. N. Downen, A. E. Champagne, J. M. Cesaratto, C. Howard, and **R. Longland**, *High-intensity-beam study of $^{17}\text{O}(p, \gamma)^{18}\text{F}$ and thermonuclear reaction rates for $^{17}\text{O}+p$* , Phys. Rev. C **91** (2015) 015812.
- [30] C. Iliadis, **R. Longland**, A. Coc, F. X. Timmes, and A. E. Champagne, *Statistical methods for thermonuclear reaction rates and nucleosynthesis simulations*, J. Phys. G **42** (2015), no. 3 034007.
- [29] P. Mohr, **R. Longland**, and C. Iliadis, *Thermonuclear reaction rate of $^{18}\text{Ne}(\alpha, p)^{21}\text{Na}$ from Monte Carlo calculations*, Phys. Rev. C **90** (2014) 065806.
- [28] A. E. Champagne, C. Iliadis, and **R. Longland**, *Nuclear astrophysics in the laboratory and in the universe*, AIP Advances **4** (2014) 041006.
- [27] **R. Longland**, D. Martin, and J. José, *Performance improvements for nuclear reaction network integration*, Astron. Astrophys. **563** (2014) A67.
- [26] D. Irvine, A. A. Chen, A. Parikh, K. Setoodehnia, T. Faestermann, R. Hertenberger, H.-F. Wirth, V. Bildstein, S. Bishop, J. A. Clark, C. M. Deibel, J. Hendriks, C. Herlitzius, R. Krücken, W. N. Lennard, O. Lepyoshkina, **R. Longland**, G. Rugel, D. Seiler, K. Straub, and C. Wrede, *Evidence for the existence of the astrophysically important 6.40-MeV state of ^{31}S* , Phys. Rev. C **88** (2013) 055803.
- [25] I. Pogrebnyak, C. Howard, C. Iliadis, **R. Longland**, and G. E. Mitchell, *Mean proton and α -particle reduced widths of the Porter-Thomas distribution and astrophysical applications*, Phys. Rev. C **88** (2013) 015808.
- [24] A. M. Laird, A. Parikh, A. S. J. Murphy, K. Wimmer, A. A. Chen, C. M. Deibel, T. Faestermann, S. P. Fox, B. R. Fulton, R. Hertenberger, D. Irvine, J. José, **R. Longland**, D. J. Mountford, B. Sambrook, D. Seiler, and H.-F. Wirth, *Is γ -ray emission from novae affected by interference effects in the $^{18}\text{F}(p, \alpha)^{15}\text{O}$ reaction?*, Phys. Rev. Lett. **110** (2013) 032502.
- [23] **R. Longland**, *Recommendations for Monte Carlo nucleosynthesis sampling*, Astron. Astrophys. **548** (2012) A30.
- [22] **R. Longland**, C. Iliadis, and A. I. Karakas, *Reaction rates for the s-process neutron source $^{22}\text{Ne}+\alpha$* , Phys. Rev. C **85** (2012) 065809.
- [21] **R. Longland**, P. Lorén-Aguilar, J. José, E. García-Berro, and L. G. Althaus, *Lithium production in the merging of white dwarf stars*, Astron. Astrophys. **542** (2012) A117.
- [20] G. Sala, F. Haberl, J. José, A. Parikh, **R. Longland**, L. C. Pardo, and M. Andersen, *Constraints on the Mass and Radius of the Accreting Neutron Star in the Rapid Burster*, Astrophys. J. **752** (2012) 158.
- [19] **R. Longland**, P. Lorén-Aguilar, J. José, E. García-Berro, L. G. Althaus, and J. Isern, *Nucleosynthesis during the merger of white dwarfs and the origin of R Coronae Borealis stars*, Astrophys. J. **737** (2011) L34.
- [18] A. Parikh, K. Wimmer, T. Faestermann, R. Hertenberger, J. José, **R. Longland**, H.-F. Wirth, V. Bildstein, S. Bishop, A. A. Chen, J. A. Clark, C. M. Deibel, C. Herlitzius, R. Krücken, D. Seiler, K. Straub, and C. Wrede, *Improving the $^{30}\text{P}(p, \gamma)^{31}\text{S}$ rate in oxygen-neon novae: Constraints on J^π values for proton-threshold states in ^{31}S* , Phys. Rev. C. **83** (2011) 045806.
- [17] R. J. Deboer, M. Wiescher, J. Görres, **R. Longland**, C. Iliadis, G. Rusev, and A. P. Tonchev, *Photoexcitation of astrophysically important states in ^{26}Mg II. Ground-state-transition partial widths*, Phys. Rev. C **82** (2010) 025802.
- [16] **R. Longland**, C. Iliadis, A. E. Champagne, J. R. Newton, C. Ugalde, A. Coc, and R. Fitzgerald, *Charged-particle thermonuclear reaction rates: I. Monte Carlo method and statistical distributions*, Nucl. Phys. A **841** (2010) 1–30.
- [15] C. Iliadis, **R. Longland**, A. E. Champagne, A. Coc, and R. Fitzgerald, *Charged-particle thermonuclear reaction rates: II. Tables and graphs of reaction rates and probability density functions*, Nucl. Phys. A **841** (2010) 31–250.
- [14] C. Iliadis, **R. Longland**, A. E. Champagne, and A. Coc, *Charged-particle thermonuclear reaction rates: III. Nuclear physics input*, Nucl. Phys. A **841** (2010) 251–322.
- [13] C. Iliadis, **R. Longland**, A. E. Champagne, and A. Coc, *Charged-particle thermonuclear reaction rates: IV. Comparison to previous work*, Nucl. Phys. A **841** (2010) 323–388.
- [12] **R. Longland**, C. Iliadis, J. M. Cesaratto, A. E. Champagne, S. Daigle, J. R. Newton, and R. Fitzgerald, *Resonance strength in $^{22}\text{Ne}(p, \gamma)^{23}\text{Na}$ from depth profiling in aluminum*, Phys. Rev. C **81** (2010) 055804.

- [11] S. Carson, C. Iliadis, J. Cesaratto, A. Champagne, L. Downen, M. Ivanovic, J. Kelley, **R. Longland**, J. R. Newton, G. Rusev, and A. P. Tonchev, *Ratio of germanium detector peak efficiencies at photon energies of 4.4 and 11.7 MeV: Experiment versus simulation*, Nucl. Inst. and Meth. A **618** (2010) 190–198.
- [10] J. R. Newton, C. Iliadis, A. E. Champagne, J. M. Cesaratto, S. Daigle, and **R. Longland**, *Measurement of $^{17}\text{O}(p,\gamma)^{18}\text{F}$ between the narrow resonances at $E_r^{\text{lab}} = 193$ and 519 keV*, Phys. Rev. C **81** (2010) 045801.
- [9] **R. Longland**, C. Iliadis, G. Rusev, A. P. Tonchev, R. J. deBoer, J. Görres, and M. Wiescher, *Photoexcitation of astrophysically important states in ^{26}Mg* , Phys. Rev. C **80** (2009) 055803.
- [8] V. Gintautas, A. E. Champagne, F. G. Kondev, and **R. Longland**, *Thermal equilibration of ^{176}Lu via K mixing*, Phys. Rev. C **80** (2009) 015806.
- [7] J. R. Newton, **R. Longland**, and C. Iliadis, *Matching of experimental and statistical-model thermonuclear reaction rates at high temperatures*, Phys. Rev. C **78** (2008) 025805.
- [6] C. Ugalde, A. E. Champagne, S. Daigle, C. Iliadis, **R. Longland**, J. R. Newton, E. Osenbaugh-Stewart, J. A. Clark, C. Deibel, A. Parikh, P. D. Parker, and C. Wrede, *Experimental evidence for a natural parity state in ^{26}Mg and its impact on the production of neutrons for the s-process*, Phys. Rev. C **76** (2007) 025802.
- [5] J. R. Newton, C. Iliadis, A. E. Champagne, **R. Longland**, and C. Ugalde, *Re-measurement of the 193 keV resonance in $^{17}\text{O}(p,\alpha)^{14}\text{N}$* , Phys. Rev. C **75** (2007) 055808.
- [4] **R. Longland**, C. Iliadis, A. E. Champagne, C. Fox, and J. R. Newton, *Nuclear astrophysics studies at the LENA facility: The γ -ray detection system*, Nucl. Inst. and Meth. A **566** (2006) 452–464.
- [3] C. Fox, C. Iliadis, A. E. Champagne, R. P. Fitzgerald, **R. Longland**, J. Newton, J. Pollanen, and R. Runkle, *Thermonuclear reaction rate of $^{17}\text{O}(p,\gamma)^{18}\text{F}$* , Phys. Rev. C **71** (2005) 055801.
- [2] R. C. Runkle, A. E. Champagne, C. Angulo, C. Fox, C. Iliadis, **R. Longland**, and J. Pollanen, *Direct measurement of the $^{14}\text{N}(p,\gamma)^{15}\text{O}$ S Factor*, Phys. Rev. Lett. **94** (2005) 082503.
- [1] C. Fox, C. Iliadis, A. E. Champagne, A. Coc, J. José, **R. Longland**, J. Newton, J. Pollanen, and R. Runkle, *Explosive hydrogen burning of ^{17}O in classical novae*, Phys. Rev. Lett. **93** (2004) 081102.

Published Work in Textbook

Authored Figs. 4.20, 4.23, and 4.31: C. Iliadis, *Nuclear Physics in Stars*, Wiley-VCH, 2007

Presentations

Invited Talks

- [11] **R. Longland**, *The Focal-plane Detector Package at the TUNL Split-pole Spectrograph*, Science with the Super-Enge Split-pole Spectrograph and Workshop on Transfer Reactions (Mar. 2019).
- [10] **R. Longland**, *Nuclear Astrophysics at FENRIS*, Ohio University Nuclear Seminar (Oct. 2018).
- [9] **R. Longland**, *Recreating Stars in the Laboratory*, UNC Wilmington Colloquium (Apr. 2018).
- [8] **R. Longland**, *Elemental abundance anomalies in globular clusters*, Russbach Workshop on Nuclear Astrophysics (Mar. 2018).
- [7] **R. Longland**, *Determining Astrophysics Cross Sections at FENRIS*, Notre Dame Nuclear Seminar (Mar. 2017).
- [6] **R. Longland**, *Nuclear Astrophysics with HI γ S – the High Intensity γ -ray Source*, TRIUMF ARIEL Science Workshop 2016 (Jul. 2016).
- [5] **R. Longland**, *Nuclear Astrophysics with Stable Particle Beams*, Russbach Workshop on Nuclear Astrophysics (Mar. 2016).
- [4] **R. Longland**, *FENRIS: The Facility for Experiments of Nuclear Reactions in Stars*, Southeastern Section of the American Physical Society, Mobile, AL (Nov. 2015).
- [3] **R. Longland**, *FENRIS: The Facility for Experiments of Nuclear Reactions in Stars*, Triangle universities Nuclear Laboratory, 50th Anniversary, Durham, NC (Nov. 2015).
- [2] **R. Longland**, *Spectrometers: Enge Split-pole Spectrometers in North America*, Low Energy Community Meeting, East Lansing, MI (Aug. 2015).
- [1] **R. Longland**, *Nuclear Astrophysics at the Triangle Universities Nuclear Laboratory*, Appalachian State University (Oct. 2015).

Professional Meetings

- [13] **R. Longland**, J. Kelley, C. Marshall, F. Portillo, and K. Setoodehnia, *Direct Reactions at the Facility for Experiments on Nuclear Reactions in Stars (FENRIS)*, in *APS Division of Nuclear Physics Meeting Abstracts*, 2017.
- [12] **R. Longland**, *Status of Monte Carlo Reaction Rates*, CoSMS Workshop on Thermonuclear Reaction Rates (Chapel Hill, NC, 2016).
- [11] **R. Longland**, J. Kelley, C. Marshall, F. Portillo, K. Setoodehnia, and D. Underwood, *Status of The Facility for Experiments of Nuclear Reactions in Stars*, in *APS Division of Nuclear Physics Meeting Abstracts*, 2016.
- [10] **R. Longland**, *Nucleosynthesis in R Corona Borealis Stars*, The Origin of Cosmic Elements: Past and Present Achievements, Future Challenges (Barcelona, Spain, 2013).
- [9] **R. Longland**, *Reaction rate of the s-process neutron source $^{22}\text{Ne}+\alpha$* , APS April Meeting (Denver, Colorado, 2013).
- [8] **R. Longland**, P. Lorén-Aguilar, J. José, E. García-Berro, and L. Althaus, *Lithium production in white dwarf mergers*, Nuclei in the Cosmos XII (Cairns, Australia, 2012).
- [7] **R. Longland** and C. Iliadis, *Current Status of the $^{22}\text{Ne}+\alpha$ s-Process Neutron Source*, Journal of Physics Conference Series **337** (Canfranc Estación, Spain, 2012) 012047.
- [6] **R. Longland**, C. Iliadis, A. Champagne, J. Newton, C. Ugalde, A. Coc, and R. Fitzgerald, *Monte Carlo rate propagation for experimentalists*, Workshop on Thermonuclear Reaction Rates for Astrophysics (Athens, Greece, 2011).
- [5] **R. Longland**, *Status of the $^{22}\text{Ne}+\alpha$ s-process neutron source*, Mini-Workshop on Nuclear Reactions of Astrophysical Interest (Madrid, Spain, 2011).
- [4] **R. Longland**, *Using Gear's method to solve nuclear reaction networks*, Eighth Russbach Workshop on Nuclear Astrophysics (Russbach, Austria, 2011).
- [3] **R. Longland**, *Nucleosynthesis in stellar mergers*, EuroGENESIS First Workshop (Dubrovnik, Croatia, 2010).
- [2] **R. Longland**, C. Iliadis, G. Rusev, A. P. Tonchev, R. J. deBoer, J. Görres, and M. Wiescher, *Photoexcitation of astrophysically important states in ^{26}Mg* , APS Meeting Abstracts (Waikoloa, Hawaii, 2009).
- [1] **R. Longland**, C. Iliadis, A. E. Champagne, C. Fox, and J. Newton, *Nuclear astrophysics at the LENA facility: The γ -ray detection system.*, APS Meeting Abstracts (Nashville, Tennessee, 2006).