

Curriculum Vitae

Nicholas C. Sterling
Professor of Physics
University of West Georgia
Department of Natural Sciences
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Research Interests: Chemical abundances of astrophysical nebulae, stellar nucleosynthesis and evolution, multi-wavelength spectroscopy, computational and experimental atomic physics and its intersection with astronomical spectroscopy

Education

- **Ph.D. in Astronomy.** The University of Texas at Austin (USA), 2006
- **Physics-Astronomy (B.S.) and Mathematics (B.S.).** The University of Wisconsin-Madison (USA), 2000

Professional Background

- *Professor of Physics*, University of West Georgia (USA), 2024–Present.
- *Associate Professor of Physics*, University of West Georgia (USA), 2018–2023.
- *Assistant Professor of Physics*, University of West Georgia (USA), 2013–2018.
- *Visiting Assistant Professor of Physics*, Valparaiso University (USA), 2012–2013.
- *National Science Foundation Postdoctoral Fellow*, Michigan State University (USA), 2009-2012.
- *NASA Postdoctoral Program Fellow*, NASA Goddard Space Flight Center (USA), 2006-2009.

Honors

- University of West Georgia (UWG) College of Arts, Culture, and Scientific Inquiry Faculty Excellence in Teaching Award, 2022
- UWG Undergraduate Research Mentor Award, 2021
- UWG College of Science and Mathematics Excellence in Research Award, 2017
- UWG Honors Professor of the Year, 2016
- UWG Faculty of the Year Nominee, Advanced Academy of Georgia, Spring 2015
- NSF Astronomy and Astrophysics Postdoctoral Fellowship. Michigan State University, 2009-2012
- NASA Postdoctoral Program Fellow. NASA Goddard Space Flight Center, 2006-2009
- William S. Livingston Outstanding Graduate Student Award. University of Texas Graduate School, 2005
- David Allen Benfield Memorial Scholarship in Astronomy. University of Texas Department of Astronomy, 2005-2006
- Frank N. Edmonds, Jr. Memorial Fellowship in Astronomy, University of Texas Department of Astronomy, 2003-2004

Courses Taught (University of West Georgia, unless noted)

- ASTR 2313 – Astronomy
- ASTR 2313H – Honors Astronomy (taught while faculty member on medical leave in 2014, 2016)
- ASTR 2313L – Astronomy Laboratory
- ASTR 3133W – Observational Astronomy
- ASTR 4103 – Stellar Astrophysics

- ASTR 4433 – Galaxies and Cosmology
- ASTR 4984W – Introduction to Astrophysical Literature (cross-listed with PHYS 4984W)
- PHYS 1111 – Introductory Physics I (algebra-based)
- PHYS 1112 – Introductory Physics II (algebra-based)
- PHYS 2212 – Principles of Physics II (calculus-based)
- PHYS 3503W – Modern Physics
- PHYS 3511W – Experimental Physics I (co-instructor)
- PHYS 3521W – Experimental Physics II
- PHYS 4103W – Astrophysics
- PHYS 4513 – Mathematical Physics
- PHYS 4984W – Physics Seminar
- PHYS 111/112 – Essentials of Physics I and II (Valparaiso University)
- PHYS 112L – Essentials of Physics II Lab (Valparaiso University)
- PHYS 141L/142L – Experimental Physics I and II (Valparaiso University)

Other Teaching Activities

- Developed Astronomy Concentration in the Physics major at University of West Georgia, 2020.
- Developed five new courses: ASTR 3133W, ASTR 4103, ASTR 4433, ASTR 4984W (2020-2023), PHYS 4103W (Fall 2014)
- Designed discipline-specific writing curriculum for ASTR 3133W, PHYS 3503W, and PHYS 4103W (2014, 2018, 2021)
- Converted PHYS 4513 into a partially-flipped format, developing several in-class group-problem solving assignments (2015, 2017, 2019, 2020)
- Developed materials and conducted workshops for introductory physics courses (PHYS 1111/1112, 2212)
- Experimental physics (PHYS 3511/3521) laboratory re-organization and introduction of new experiments

Supervision of Student Research

Undergraduate Students

Supervised research projects by 37 undergraduate students at the University of West Georgia, 2013–Present. Of these, 23 have conducted research with me since Fall 2017. Many students have conducted research with me across multiple semesters or multiple years. Student highlights include:

- First authorship on an Astrophysical Journal Letter, and two in preparation (Astrophysical Journal, Astronomy & Astrophysics)
- Three co-authorships on papers in high-impact physics and astronomy journals, with another seven co-authorships on three papers currently in preparation.
- Seven presentations at American Astronomical Society meetings
- Six presentations at Georgia Regional Astronomy Meetings
- Eight presentations at Georgia Academy of Sciences meetings
- One presentation at a Southeastern Laboratory Astrophysics Workshop and one at the Conference for Undergraduate Women in Physics

I also supervised senior theses for two undergraduate students at Valparaiso University (2012-2013), and one student at Michigan State University (2011-2012)

Graduate Students

- Simone Madonna (Ph.D Thesis Co-Supervisor), Universidad de La Laguna (Spain), 2016–2019.
- Catherine Manea (Co-supervisor, Second Year Project), University of Texas at Austin, 2021–2022.

External Funding

- Project Title: *Collaborative Research: Empirical Constraints on the s- and r-processes from Precision Nebular Abundances*
Role: Principal Investigator (Lead)
Source of Support: National Science Foundation (Astronomy and Astrophysics Division)
Total Award Amount: \$322,566 (University of West Georgia: \$209,885)
Award Period: August 2023 – July 2026
- Project Title: *Promoting Diversity and Inclusion in Astronomy Through Summer Research Opportunities at the University of West Georgia*
Source of Support: NASA Georgia Space Grant Consortium
Role: Principal Investigator
Total Award Amount: \$4,763
Award Period: July 2022 – June 2023
- Project Title: *Collaborative Research: A joint theoretical and experimental approach to low-temperature dielectronic recombination data for photoionized astrophysical environments*
Role: Co-Investigator / Institutional Principal Investigator (Lead PI: Michael Fogle, Jr., Auburn University)
Source of Support: National Science Foundation (Astronomy and Astrophysics Division)
Total Award Amount: \$493,396 (University of West Georgia: \$80,128)
Award Period: September 2021 – August 2024
- Project Title: *Promoting Diversity and Inclusion in Astronomy Through Summer Research Opportunities*
Source of Support: NASA Georgia Space Grant Consortium
Role: Principal Investigator
Total Award Amount: \$1,680
Award Period: August 2021 – June 2022
- Project Title: *Summer Astronomy Research Program for Underrepresented Groups in STEM*
Source of Support: NASA Georgia Space Grant Consortium
Role: Principal Investigator
Total Award Amount: \$2,654
Award Period: July 2019 – June 2020
- Project Title: *University of West Georgia Summer Astronomy Research Program for Underrepresented Groups in STEM*
Source of Support: NASA Georgia Space Grant Consortium
Role: Principal Investigator
Total Award Amount: \$4,944
Award Period: July 2018 – June 2019
- Project Title: *Probing Chemical Enrichments in Planetary Nebulae with EXES on SOFIA*
Source of Support: NASA/SOFIA
Role: Co-Investigator (PI: Harriet Dinerstein, University of Texas)
Total Award Amount: \$87,000
Award Period: January 2017 – December 2018
- Project Title: *An Expansion of the University of West Georgia's Solar and Night-Sky Observing Capabilities*
Source of Support: NASA Georgia Space Grant Consortium
Role: Principal Investigator
Total Award Amount: \$8,901
Award Period: August 2016 – July 2017

- Project Title: *RUI: Expanding the Atomic Database for Nebular and Stellar Neutron-Capture Element Abundance Determinations*
Role: Principal Investigator
Source of Support: National Science Foundation (Division of Astronomy and Astrophysics)
Total Award Amount: \$320,399
Award Period: August 2014 – July 2017
- Project Title: *Exploring the Nucleosynthesis of Neutron-Capture Elements Through Nebular Spectroscopy*
Role: Principal Investigator
Source of Support: National Science Foundation, Astronomy and Astrophysics Postdoctoral Fellowships
Total Award Amount: \$249,000
Award Period: October 2009 – July 2012
- Project Title: *New Atomic Data for Determining Neutron-Capture Element Abundances in Ionized Nebulae*
Role: Science Principal Investigator (PI T. R. Kallman, NASA Goddard Space Flight Center)
Source of Support: NASA Astronomy and Physics Research and Analysis
Total Award Amount: \$153,284
Award Period: October 2007 – September 2009
- Unfunded Collaborator on three other successful grants (National Science Foundation; Ministerio de Ciencia y Innovación, Spain) since 2016, and two pending proposals, one submitted to the NSF and one to NASA in 2023.
- Internal funding (University of West Georgia) totaling \$65,600 to support research initiatives, undergraduate research students, the campus observatory, and teaching grants to institute high-impact pedagogical practices into introductory and upper-division physics courses. Of this, \$25,600 was awarded since Fall 2017, including a \$14,999 Tech Fee Grant to purchase an imaging camera for the UWG Observatory.

Publications

Refereed Publications (UWG undergraduate students in boldface)

30 refereed publications, 1,039 citations, 107 entries in the SAO/NASA Astrophysics Data System Abstract Query System, Hirsch (h)-index 16.

31. Britton, J., Kilcoyne, A. L. D., Aguilar, A., Sterling, N. C., Bilodeau, R. C., Juarez, A., Bautista, M., Taylor, Z., and Macaluso, D. 2024, *Absolute Single Photoionization Cross-Section Measurements of Br⁺ Ions: Experiment and Theory*, Journal of Physics B, submitted
30. Manea, C., Dinerstein, H. L., Sterling, N. C., & Zeimann, G. 2022, *Chemical Abundances of Eight Highly-extincted Milky Way Planetary Nebulae*, Astronomical Journal, 164, 185
29. Sterling, N. C. 2020, *Neutron-Capture Element Abundances in Planetary Nebulae*, Galaxies, 8, 50
28. Nemer, A., Sterling, N. C., Raymond, J., Dupree, A. K., García-Rojas, J., Wang, Q., Pindzola, M. S., Balance, C. P., & Loch, S. D. 2019, *First Evidence of Enhanced Recombination in Astrophysical Environments and the Implications for Plasma Diagnostics*, Astrophysical Journal Letters, 887, L9
27. Macaluso, D. A., Aguilar, A., Kilcoyne, A. L. D., Bilodeau, R. C., Juárez, A. M., Dumitriu, I., Hardy, D., Sterling, N. C., and Bautista, M. 2019, *Absolute single photoionization cross-sections of Br³⁺: experiment and theory*, Journal of Physics B, 52, 145002
26. Madonna, S., Bautista, M., Dinerstein, H. L., Sterling, N. C., García-Rojas, J., Kaplan, K. F., Rubio-Díez, M. M., Castro-Rodríguez, N., & Garzón, F. 2018, *Neutron-capture Elements in Planetary Nebulae: First Detections of Near-infrared [Te III] and [Br V] Emission Lines*, Astrophysical Journal Letters, 861, L8
25. Madonna, S., García-Rojas, J., Sterling, N. C., Delgado-Inglada, G., Mesa-Delgado, A., Luridiana, V., Roederer, I. U., & **Mashburn, A. L.** 2017, *Neutron-capture element abundances in the planetary nebula NGC*

- 5315 from deep optical and near-infrared spectrophotometry, *Monthly Notices of the Royal Astronomical Society*, 471, 1341
24. Sterling, N. C., Madonna, S., Butler, K., García-Rojas, J., **Mashburn, A. L.**, Morisset, C., Luridiana, V., & Roederer, I. U. 2017, *Identification of Near-infrared [Se III] and [Kr VI] Emission Lines in Planetary Nebulae*, *Astrophysical Journal*, 840, 80
 23. Macaluso, D. A., Bogolub, K., Johnson, A., Aguilar, A., Kilcoyne, A. L. D., Bilodeau, R. C., Bautista, M., **Kerlin, A. B.**, and Sterling, N. C. 2016, *Absolute single photoionization cross-section measurements of Rb²⁺ ions: experiment and theory*, *Journal of Physics B*, 49, 235002
 22. **Mashburn, A. L.**, Sterling, N. C., Dinerstein, H. L., Roederer, I. U., & Geballe, T. R. 2016, *The Detection of Neutron-Capture Elements in Magellanic Cloud Planetary Nebulae*, *Astrophysical Journal Letters*, 831, L3
 21. Sterling, N. C., Dinerstein, H. L., Kaplan, K. F., & Bautista, M. A. 2016, *Discovery of Rubidium, Cadmium, and Germanium Emission Lines in the Near-Infrared Spectra of Planetary Nebulae*, *Astrophysical Journal Letters*, 819, L9
 20. Macaluso, D. A., Aguilar, A., Kilcoyne, A. L. D., Red, E. C., Bilodeau, R. C., Phaneuf, R. A., Sterling, N. C., and McLaughlin, B. M. 2015, *Absolute single photoionization cross-sections of Se²⁺: Experiment and Theory*, *Physical Review A*, 92, 063424
 19. García-Rojas, J., Madonna, S., Luridiana, V., Sterling, N. C., Morisset, C., Delgado-Inglada, G., & Toribio San Cipriano, L. 2015, *S-process enrichments in the planetary nebula NGC 3918. Results from deep echelle spectrophotometry*, *Monthly Notices of the Royal Astronomical Society*, 452, 2606
 18. Sterling, N. C., Porter, R. L., & Dinerstein, H. L. 2015, *The Abundances of Light Neutron-Capture Elements in Planetary Nebulae III. The Impact of New Atomic Data on Nebular Selenium and Krypton Abundance Determinations*, *Astrophysical Journal Supplement Series*, 218, 25
 17. Esteves, D. A., Aguilar, A., Bilodeau, R. C., Phaneuf, R. A., Kilcoyne, A. L. D., Red, E. C., and Sterling, N. C. 2012, *Absolute Experimental Photoionization Cross Sections of Se³⁺ and Se⁵⁺ Near Their Ground State Thresholds*, *Journal of Physics B*, 45, 115201
 16. Sterling, N. C., and Stancil, P. C. 2011, *Atomic Data for Neutron-Capture Elements III. Charge Transfer Rate Coefficients for Low-Charge Ge, Se, Br, Kr, Rb, and Xe Ions*, *Astronomy & Astrophysics*, 535, A117
 15. Sterling, N. C. 2011, *Atomic Data for Neutron-Capture Elements II. Photoionization and Recombination Properties of Low-Charge Krypton Ions*, *Astronomy & Astrophysics*, 533, A62
 14. Esteves, D. A., Bilodeau, R. C., Sterling, N. C., Phaneuf, R. A., Kilcoyne, A. L. D., Red, E., and Aguilar, A. 2011, *Absolute High-Resolution Se⁺ Photoionization Cross-Section Measurements with Higher-Order Radiation Analysis*, *Physical Review A*, 84, 013406
 13. Sterling, N. C., & Witthoef, M. C. 2011, *Atomic Data for Neutron-Capture Elements I. Photoionization and Recombination Properties of Low-Charge Selenium Ions*, *Astronomy & Astrophysics*, 529, A147
 12. Sterling, N. C., Esteves, D., Bilodeau, R. C., Kilcoyne, A. L. D., Red, E. C., Phaneuf, R. A., and Aguilar, A. 2011, *Experimental Photoionization Cross-Section Measurements in the Ground and Metastable State Threshold Region of Se⁺*, *Journal of Physics B*, 44, 025701
 11. Sterling, N. C., Witthoef, M. C., Esteves, D. A., Bilodeau, R. C., Kilcoyne, A. L. D., Red, E. C., Phaneuf, R. A., Alna'Washi, G., and Aguilar, A. 2011, *New Atomic Data for Trans-Iron Elements and Their Application to Abundance Determinations in Planetary Nebulae*, *Canadian Journal of Physics*, 89, 379
 10. Sterling, N. C., et al. 2009, *Improved Neutron-Capture Element Abundances in Planetary Nebulae*, *Publications of the Astronomical Society of Australia*, 26, 339
 9. Karakas, A. I., van Raai, M. A., Lugaro, M., Sterling, N. C., & Dinerstein, H. L. 2009, *Nucleosynthesis Predictions for Intermediate-Mass AGB Stars: Comparison to Observations of Type I Planetary Nebulae*, *Astrophysical Journal*, 690, 1130
 8. Sterling, N. C., & Dinerstein, H. L. 2008, *The Abundances of Light Neutron-Capture Elements in Planetary Nebulae II. s-process Enrichments and Interpretation*, *Astrophysical Journal Supplement Series*, 174, 158
 7. Sterling, N. C., Dinerstein, H. L., & Kallman, T. R. 2007, *The Abundances of Light Neutron-Capture Elements in Planetary Nebulae I. Photoionization Modeling and Ionization Corrections*, *Astrophysical Journal*

Supplement Series, 169, 37

6. Gies, D. R., et al. 2007, *CHARA Array K'-Band Measurements of the Angular Dimensions of Be Star Disks*, *Astrophysical Journal*, 654, 527
5. Sterling, N. C., Dinerstein, H. L., Bowers, C. W., & Redfield, S. 2005, *The FUSE Spectrum of the Planetary Nebula SwSt 1: Evidence for Inhomogeneities in the Gas and Dust*, *Astrophysical Journal*, 625, 368
4. Sterling, N. C., Dinerstein, H. L., & Bowers, C. W. 2002, *Discovery of Enhanced Germanium Abundances in Planetary Nebulae With the Far Ultraviolet Spectroscopic Explorer*, *Astrophysical Journal*, 578, L55
3. Sterling, N. C., Savage, B. D., Richter, P., Fabian, D., & Sembach, K. R. 2002, *Far Ultraviolet Spectroscopic Explorer Observations of O VI Overlying the Scutum Supershell*, *Astrophysical Journal*, 567, 354
2. Reynolds, R. J., Sterling, N. C., & Haffner, L. M. 2001, *Detection of a Large Arc of Ionized Hydrogen Far Above the Cassiopeia OB6 Association: A Superbubble Blowout Into the Galactic Halo?*, *Astrophysical Journal*, 558, L101
1. Reynolds, R. J., Sterling, N. C., Haffner, L. M., & Tufte, S. L. 2001, *Detection of [N II] 5755 Emission From Low-Density Ionized Interstellar Gas*, *Astrophysical Journal*, 548, L221

Invited Talks

26. University of Texas at Austin, Astronomy Student Association Seminar, 19 March 2024.
25. University of North Georgia, Physics and Astronomy Seminar, 19 October 2023.
24. International Astronomical Union Symposium 384: "Planetary Nebulae: a Universal Toolbox in the Era of Precision Astrophysics," Krakow, Poland, 5 September, 2023.
23. Workplans II: Workshop for Planetary Nebula Observations, Leiden, Netherlands (**Invited Review**), 16 December, 2019.
22. Georgia Regional Astronomy Meeting, 26 October, 2019.
21. Konkoly Observatory (Budapest, Hungary), Colloquium, 22 March, 2018.
20. The Cosmic Feast of the Elements, Puebla, Mexico (**Invited Review**), 24 October, 2017.
19. International Astronomical Union Symposium 323: "Planetary Nebulae: Multi-Wavelength Probes of Stellar and Galactic Evolution," Beijing, China (**Invited Review**), 10 October, 2016.
18. Annual Celebration of UWG Research and Creative Activities, University of West Georgia, 25 February, 2016.
17. Georgia State University, Astronomy Colloquium, 6 October, 2015.
16. Instituto de Astrofísica de Canarias (La Laguna, Spain), Astronomy and Astrophysics Seminar, 7 July, 2015.
15. COSM Dean's Research Seminar, University of West Georgia, 4 October 2013.
14. Low-Energy Nuclear Physics Community Meeting, Astrophysics Breakout Session, Argonne National Laboratory, 16 August 2012.
13. Valparaiso University, Department of Physics and Astronomy Colloquium, 4 November 2011.
12. Wayne State University, Department of Physics and Astronomy Colloquium, 19 April 2011.
11. University of Georgia, Center for Simulational Physics Seminar, 25 January 2011.
10. University of Michigan, Department of Astronomy Colloquium, 11 November 2010.
9. Western Michigan University, Department of Physics Colloquium, 18 October 2010.
8. 10th International Colloquium on Atomic Spectra and Oscillator Strengths for Astrophysical and Laboratory Plasmas, Berkeley, CA, 6 August 2010.
7. Asymmetrical Planetary Nebulae V, Bowness-On-Windermere, UK, 22 June 2010.
6. Carnegie Institute of Washington, Department of Terrestrial Magnetism Seminar, 17 April 2009.
5. The Origin Of the Elements Heavier than Fe, Torino, Italy, 25 September 2008.
4. NASA Goddard Space Flight Center, Astrophysics Science Division Colloquium, 12 February 2008.
3. Advanced Light Source (Lawrence Berkeley National Laboratory), Scientific Support Group Lecture Series, 18 October 2007.
2. Asymmetrical Planetary Nebulae IV, La Palma, Spain, 19 June 2007.
1. Deep Spectroscopy and Modeling of Emission-Line Nebulae Workshop, Beijing, China, 16 April 2007.
0. IAU Symp. 234: Planetary Nebulae in our Galaxy and Beyond, Kona, HI, 4 April 2006.

Conference Papers and Presentations since 2013 (UWG undergraduate students in boldface)

52. Garcia, J. I., Loch, S., Fogle, M., & Sterling, N. C. 2023, *Improved algorithms for calculating low temperature dielectronic recombination rate coefficients in photoionized astrophysical plasmas*, in the 242nd Meeting of the American Astronomical Society (Albuquerque, NM), poster #124.09
51. Garbe, E., Taghadomi, Z., Stancil, P., Garcia, J. I., Loch, S., Fogle, M., & Sterling, N. C. 2023, *Improving Dielectric Recombination Rate Coefficients for the Li- and Be-like Isoelectronic Sequences*, in the 242nd Meeting of the American Astronomical Society (Albuquerque, NM), poster #124.15
50. **Gordon, S. F.**, Sterling, N. C., Dinerstein, H. L., & Vacca, W. D. 2023, *Revealing the Heavy Element Compositions of Planetary Nebulae with the NASA-IRTF*, in the American Physics Society Conference of Undergraduate Women in Physics (Auburn, AL)
49. **Hanham, A.**, Sterling, N. C., Dinerstein, H. L., & Kaplan, K. F. 2022, *New Insights into AGB Nucleosynthesis From Deep, High-Resolution Near-Infrared Spectroscopy of Planetary Nebulae*, in the 2022 Georgia Regional Astronomy Meeting (Macon, GA)
48. **Stephenson, M. G.**, Sterling, N. C., Dinerstein, H. L., Kaplan, K. F., Karakas, A. I., Lugaro, M., García-Rojas, J., & Yagüe-López, A. 2022, *Heavy Element Abundances in Large Magellanic Cloud Planetary Nebulae from High-Resolution Near-Infrared Spectroscopy*, in the 240th Meeting of the American Astronomical Society (Pasadena, CA), poster #351.03
47. Sterling, N. C., & **Matteson, L. S.** 2022, *Atomic Data for Neutron-Capture Elements: Charge Exchange of Low-Charge Cadmium and Tellurium Ions with Hydrogen*, in the 240th Meeting of the American Astronomical Society (Pasadena, CA), poster #351.07
46. Dinerstein, H. L., Sterling, N. C., Kaplan, K. F., & Bautista, M. A. 2022, *New Infrared Emission Lines of the Heavy Neutron-Capture Elements Te and Xe in Planetary Nebulae*, in the 240th Meeting of the American Astronomical Society (Pasadena, CA), poster #351.06
45. Saha, J., Dinerstein, H. L., Sterling, N. C., Karakas, A. I., & Lugaro, M. 2022, *Comparison of the Predicted s-Process Enrichments from Different AGB Evolutionary Models*, in the 240th Meeting of the American Astronomical Society (Pasadena, CA), poster #351.05
44. Macaluso, D. A., Aguilar, A., Bilodeau, R. C., Sterling, N. C., Bautista, M. A., Taylor, Z., Kilcoyne, A. L. D., & Juarez, A. 2022, *Absolute Single Photoionization Cross-Section Measurements of Rb³⁺*, in the APS Division of Atomic and Molecular Physics Meeting, V01.128
43. Macaluso, D. A., Kilcoyne, A. L. D., Britton, J., Aguilar, A., Bilodeau, R. C., Sterling, N. C., Juarez, A., & Bautista, M. A. 2022, *Absolute Single Photoionization Cross-Section Measurements of Br⁺*, in the APS Division of Atomic and Molecular Physics Meeting, V01.123
42. Dinerstein, H. L., Sterling, N. C., Vacca, W. D., Bautista, M. A. 2021, *New Infrared Emission Lines of the s-Process Enriched Neutron-Capture Elements Br and Rb in Planetary Nebulae*, in the 237th Meeting of the American Astronomical Society (Virtual), poster #2021nli548p13
41. **Dyer, D.**, & Sterling, N. C., *Photoionization and Recombination Properties of Low-Charge Tellurium Ions: Atomic Data for Neutron-Capture Elements*, in the 2019 Georgia Regional Astronomy Meeting (Dalton, GA)
40. **Matteson, L. S.**, and Sterling, N. C., *Charge Transfer Between Cadmium, Tellurium, and Cesium Ions and Hydrogen: Atomic Data for Neutron-Capture Elements*, in the 2019 Georgia Regional Astronomy Meeting (Dalton, GA)
39. Evans, J., Bogolub, K., Mueller, A., Aguilar, A., Kilcoyne, A. L. C., Bilodeau, R. C., Bautista, M., **Kerlin, A. B.**, Sterling, N. C., and Macaluso, D. A. 2019, *Absolute single photoionization cross section measurements of isoelectronic Br³⁺ and Rb⁵⁺ ions*, in the 2019 American Physical Society Division of Atomic and Molecular Physics Meeting, S01.003
38. Nemer, A., Loch, S., Sterling, N. C., Raymond, J. C., & García-Rojas, J. 2019, *The first evidence of enhanced recombination in planetary nebulae and the implications on photo-ionized plasmas*, in the 233rd Meeting of the American Astronomical Society (Seattle, WA), poster #251.02
37. **Matteson, L. S.**, Sterling, N. C., Dinerstein, H. L., **Lewis-Marshall, B. T.**, & Turbyfill, A. 2019, *Abundances of the Planetary Nebulae NGC 3242 and IC 2003 from High-Resolution Optical Spectra*, in the

- 233rd Meeting of the American Astronomical Society (Seattle, WA), poster #150.09
36. **Hill, J. A.**, Sterling, N. C., & **Morgenstern, N. D.** 2019, *Near-Infrared Spectroscopy of Neutron-Capture Elements in Southern Hemisphere Planetary Nebulae*, in the 233rd Meeting of the American Astronomical Society (Seattle, WA), poster #150.08
 35. Dinerstein, H. L., Sterling, N. C., Kaplan, K. F., & Karakas, A. I. 2019, *Assessing Planetary Nebulae as Sources of Neutron-Capture Elements*, in the 233rd Meeting of the American Astronomical Society (Seattle, WA), poster #150.07
 34. Sterling, N. C., Porter, R. L., **Lewis-Marshall, B. T.**, **Sherrard, C. G.**, Dinerstein, H. L., & Kaplan, K. F. 2019, *Ionization Corrections for Determining Bromine, Rubidium, and Xenon Abundances in Ionized Nebulae*, in the 233rd Meeting of the American Astronomical Society (Seattle, WA), poster #150.06
 33. Nemer, A., Loch, S. D., Sterling, N. C., & Raymond, J. C. 2018, *A search for evidence of below threshold dielectronic recombination in low temperature plasmas*, in the 232nd Meeting of the American Astronomical Society (Denver, CO), poster #405.07
 32. Dinerstein, H. L., Sterling, N. C., Richter, M. J., DeWitt, C., Montiel, E. J., & Karakas, A. I. 2018, *A Search for Mid-Infrared Emission Lines of F and Na in Planetary Nebulae with EXES on SOFIA: Testing AGB Nucleosynthesis*, in the 231st Meeting of the American Astronomical Society (Washington, DC), poster #241.15
 31. Sterling, N. C., Porter, R. L., Bautista, M. A., **Lewis-Marshall, B. T.**, **Spencer, C. L.**, & **Sherrard, C. G.** 2018, *The Impact of New Atomic Data on Nebular Bromine, Rubidium, and Xenon Abundances*, in the NASA Laboratory Astrophysics Workshop (Athens, GA)
 30. **Lewis-Marshall, B. T.**, Sterling, N. C., Porter, R. L., & **Harrison, J. E.** 2018, *Abundances and Ionization Equilibrium Solutions of Bromine, Rubidium, and Xenon in Astrophysical Nebulae*, Georgia Journal of Science, 76, 2 (Presented at the 2018 annual meeting of the Georgia Academy of Science)
 29. **Sherrard, C. G.**, Sterling, N. C., Dinerstein, H. L., Madonna, S., & **Mashburn, A. L.** 2017, *Abundance Analysis of 17 Planetary Nebulae from High-Resolution Optical Spectroscopy*, in the 230th Meeting of the American Astronomical Society (Austin, TX), poster #318.11
 28. Sterling, N. C., Porter, R. L., **Spencer, C. L.**, & **Sherrard, C. G.** 2017, *Photoionization Models of Bromine, Rubidium, and Xenon in Planetary Nebulae*, in the 230th Meeting of the American Astronomical Society (Austin, TX), poster #318.10
 27. Dinerstein, H. L., Karakas, A. I., Sterling, N. C., & Kaplan, K. F. 2017, *New Measurements of s-Process Enrichments in Planetary Nebulae from High-Resolution Near-Infrared Spectra*, in the 230th Meeting of the American Astronomical Society (Austin, TX), poster #318.09
 26. Sterling, N. C. 2017, *Atomic Data and Neutron-Capture Element Abundances in Planetary Nebulae*, in Planetary Nebulae: Multi-wavelength probes of stellar and galactic evolution, International Astronomical Union Symposium 323 (Beijing, China), eds. X.-W. Liu, L. Stanghellini, & A. I. Karakas, 323, 74
 25. Dinerstein, H. L., Geballe, T. R., & Sterling, N. C. 2017, *Abundances of Iron-Group Elements in Planetary Nebulae and Consequences for Chemical Enrichment*, in Planetary Nebulae: Multi-wavelength probes of stellar and galactic evolution, International Astronomical Union Symposium 323 (Beijing, China), eds. X.-W. Liu, L. Stanghellini, & A. I. Karakas, 323, 82
 24. **Sherrard, C. G.**, Sterling, N. C., Madonna, S., **Spencer, C. L.**, & **Mashburn, A. L.** 2017, *Elemental Abundances in 16 Planetary Nebulae from Deep, High-Resolution Optical Spectroscopy*, Georgia Journal of Science, 75, 88 (Talk presented at the 2017 annual meeting of the Georgia Academy of Science)
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 18. **Mashburn, A. L.**, Sterling, N. C., Dinerstein, H. L., Garofali, K., Jensema, R. J., Turbyfill, A., **Wieser, H. N.**, **Reed, E. C.**, & Redfield, S. 2016, *Heavy Element Abundances in Planetary Nebulae from Deep Optical Echelle Spectroscopy*, in the 227th Meeting of the American Astronomical Society (Kissimmee, FL), poster #238.04
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 16. **Clark, A. E.**, & Sterling, N. C. 2016, *A Search for Heavy Elements in the Faint Planetary Nebula M 1-80*, in Georgia Journal of Science, 74, 50 (Presented at the 2016 annual meeting of the Georgia Academy of Science)
 15. **Morgenstern, N. D.**, Sterling, N. C., & **Wood, D. V.** 2016, *Heavy Elements in Southern Hemisphere Planetary Nebulae*, in GA Journal of Science, 74, 50 (Presented at the 2016 annual meeting of the Georgia Academy of Science)
 14. Madonna, S., García-Rojas, J., Luridiana, V., Sterling, N. C., & Morisset, C. 2016, *A window on the efficiency of the s-process in AGB stars: chemical abundances of n-capture elements in the planetary nebula NGC 3918*, in “AGB Stars: a key ingredient in the understanding and interpretation of stellar populations,” *Memorie della Società Astronomica Italiana*, 87, 299
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 10. Macaluso, D. A., Mueller, A., **Kerlin, A. B.**, Gross, D., Bautista, M. A., Sterling, N. C., and Bilodeau, R. C. 2015, *Absolute Photoionization of Br⁺ and Rb³⁺ Ions for the Determination of Elemental Abundances in Astrophysical Nebulae*, in the 46th Annual Meeting of the Division of Atomic, Molecular, and Optical Physics (American Physical Society), poster #K1.00155
 9. **Kerlin, A. B.**, Macaluso, D. A., Bautista, M. A., Bilodeau, R. C., Aguilar, A., Kilcoyne, A. L. D., Dumitriu, I., and Sterling, N. C. 2015, *A Theoretical and Experimental Investigation of the Atomic Properties of Low-Charge Bromine and Rubidium Ions*, in Laboratory Astrophysics for Beyond Hubble: Fundamental Processes from the NIR to the FUV, Southeastern Laboratory Astrophysics Consortium (SELAC) Workshop (Calloway Gardens, GA), <http://www.physast.uga.edu/workshops/selac15/abstracts>
 8. Sterling, N. C., Porter, R. L., & Dinerstein, H. L. 2015, *A New Analysis of s-process Enrichments in Planetary Nebulae*, in the 225th Meeting of the American Astronomical Society (Seattle, WA), poster #140.50
 7. **Mashburn, A. L.**, Sterling, N. C., & Roederer, I. U. 2015, *The Detection of Neutron-Capture Elements in Magellanic Cloud Planetary Nebulae*, in the 225th Meeting of the American Astronomical Society (Seattle, WA), poster #140.49
 6. **Wieser, H. N.**, **Reed, E. C.**, & Sterling, N. C. 2015, *Deep Optical Spectroscopy of the Planetary Nebulae NGC 6741 and NGC 6881*, in GA Journal of Science, 73, 57 (Presented at the 2015 GA Academy of Science)

Meeting in Milledgeville, GA)

5. García-Rojas, J., Madonna, S., Luridiana, V., Sterling, N. C., & Morisset, C. 2015, *S-Process Enrichment in the Planetary Nebula NGC 3918*, in Highlights of Spanish Astrophysics VIII: Proceedings of the XI Scientific Meeting of the Spanish Astronomical Society, ed. A. J. Cenarro et al., 476
4. Dinerstein, H. L., Geballe, T. R., & Sterling, N. C. 2014, *The Chemical Diversity of Planetary Nebulae*, in the 223rd Meeting of the American Astronomical Society (Austin, TX), poster #353.29
3. Turbyfill, A., Dinerstein, H. L., & Sterling, N. C. 2014, *Investigating Possible Departures from Maxwellian Energy Distributions in Nebulae using High-Resolution Emission-Line Spectra*, in the 223rd Meeting of the American Astronomical Society (Austin, TX), poster #353.18
2. Mueller, A., Macaluso, D., Sterling, N. C., Juarez, A., Dumitriu, I., Bilodeau, R. Red, E., Hardy, D., & Aguilar, A. 2013, *Absolute Photoionization of Rb⁺ and Br²⁺ Ions for the Determination of Elemental Abundances in Astrophysical Nebulae*, in the 44th Annual Meeting of the Division of Atomic, Molecular, and Optical Physics (American Physical Society), poster #Q1.141
1. Sterling, N. C., Garofali, K., Dinerstein, H. L., Hwang, S., & Redfield, S., 2013, *Deep Optical Spectroscopy of Planetary Nebulae: The Search for Neutron-Capture Elements*, in the 221st Meeting of the American Astronomical Society, poster #249.01

Ph. D. Thesis

- Sterling, N. C. 2006
The Abundances of Light Neutron-Capture Elements in Planetary Nebulae
The University of Texas at Austin, adviser Harriet L. Dinerstein

Membership and Offices in Professional Societies

- American Astronomical Society (AAS), **Full Member**, 2002–Present.
- Laboratory Astrophysics Division of the AAS, **Member**, 2015–Present.
- International Astronomical Union, **Member**, 2018–Present.
- Georgia Academy of Sciences, **Member**, 2014–2021.

Professional Service

- **Member** of the NASA Future Investigators in NASA Earth and Space Science and Technology program Review Panel, 2024.
- **Member** of the Georgia Regional Astronomy Meeting Steering Committee, 2023–Present.
- **Reviewer** of proposals for time on 8.2-meter Very Large Telescope in Chile, May 2022.
- **Member** of the Georgia Academy of Science Membership Committee, 2019-2021.
- **Member** of NASA Astrophysics Research and Analysis Grant Proposal Review Panel, 7-9 May 2019.
- **Judge**, Chambliss Awards, 233rd Meeting of the American Astronomical Society, 6-10 January, 2019.
- **Reviewer** of proposals for time on the Gran Telescopio de Canarias in Spain, June 2019.
- **Chair** of NASA Astrophysics Research and Analysis Grant Proposal Review Panel, 12-13 June 2014.
- **Councilor**, Georgia Academy of Science Section IV (Physics, Math, Computer Science, Engineering and Technology), April 2017 – April 2020.
- **Member** of the *Hubble Space Telescope* Cycle 18 Review Panel, 12–13 May 2010.
- **Scientific Referee** for Galaxies, 2020–Present.
- **Scientific Referee** for the Monthly Notices of the Royal Astronomical Society, 2017.
- **Scientific Referee** for the Canadian Journal of Physics, 2017–Present.
- **Scientific Referee** for the Astrophysical Journal, 2005–Present.
- **Scientific Referee** for the Georgia Journal of Science, 2013.

Institutional Service

- Faculty Senate Facilities and Information Technology Committee representative, 2023–Present.
- Director of UWG Observatory, 2021–Present.
- Diversity, Equity, and Inclusion Committee, College of Arts, Culture, and Scientific Inquiry, 2020–Present.
- UWG Faculty Research Grant Reviewer, 2021.
- Computer Science Program Promotion and Tenure Committee, 2020.
- Faculty Senate, 2015–2021.
- Member of Faculty Senate Hearing Committee, 2020.
- **Chair**, Faculty Senate Undergraduate Programs Committee, 2017–2018, 2019–2020.
- Faculty Senate Undergraduate Programs Committee, 2015–2021.
- **Chair**, College of Science and Mathematics (COSM) Promotion and Tenure Committee, 2019–2020.
- Office of Research and Sponsored Projects Advisory Board, 2019.
- **Chair**, Department of Physics Post-Tenure Review Committee, 2018–2019.
- COSM Promotion and Tenure Committee, 2018–2019.
- COSM Dean’s Advisory Committee, 2016–2017.
- COSM Committee for NSF S-STEM grant proposal for student scholarships, 2017.
- COSM Curriculum Committee, 2014–2016.
- COSM Vision Committee, 2015.
- COSM QEP Implementation Committee, 2014.
- Disciplinary Appeals Committee, 2013–2015.

Public Outreach and Other Service

- Astronomy Day UWG Newnan, high school outreach and enrichment, 2024–Present.
- Chair of Judging and Awards, West Georgia Regional Science and Engineering Fair, 2019–Present.
- Led public and student observations at UWG Campus Observatory, 2021–Present.
- Presentation at UWG Alumni Night, April 2023.
- Designed and led activities for Mad Scientist Summer Camp at UWG, June 2022.
- Public Talk with Casey McGuire (Art): “Art and Astronomy: Communicating Scientific Discoveries,” Newnan, GA, 29 March 2022.
- Created bi-annual public lecture series “The Infinite Universe,” University of West Georgia, 2016–2019.
- Astronomy presentations at regional high schools and middle schools, 2016, 2018, 2021–2023.
- Public talk at opening of UWG Newnan campus, *Light in the Darkness: Decoding the Universe*, 14 August 2015.
- Designed and led astronomy-themed activities for Pre-K–5 students, 2013, 2014, 2016.