

## **CURRICULUM VITAE**

GREGORY T RUSHTON  
Professor and TSEC Director  
January 2023

### **GENERAL INFORMATION**

Department of Chemistry and Biochemistry and  
TN STEM Education Center (TSEC)  
Middle Tennessee State University  
MTSU Box 82, Murfreesboro, TN 37132

### **EDUCATION**

August 2004 Ph.D., University of South Carolina, Columbia, SC, Organic Chemistry  
August 1998 M.Ed., University of South Carolina, Columbia, SC, Secondary Education (Science)  
May 1993 B.A, University of Southern California, Los Angeles, CA, Chemistry

### **PROFESSIONAL APPOINTMENTS**

2018-present **Director**, Tennessee STEM Education Center (TSEC), Murfreesboro, TN  
2018-present **Professor**, Department of Chemistry, Middle Tennessee State University, Murfreesboro, TN  
2021-2022 **Director of Strategic Growth**, Office of Research and Sponsored Programs, Middle Tennessee State University, Murfreesboro, TN  
2015-2018 **Associate Professor**, Chemistry Department and the Institute for STEM Education, Stony Brook University, Stony Brook, NY.  
2015-2018 **Associate Director**, Ph.D. program in Science Education, Institute for STEM Education (I-STEM), Stony Brook University, Stony Brook, NY  
2014 (Fall) **Visiting Academic**, Faculty of Science, Curtin University, Perth, Western Australia.  
2012-2018 **Associate Editor**, *Journal of Chemical Education*.  
2009-2015 **Associate Professor**, Department of Chemistry and Biochemistry, Kennesaw State University, Kennesaw, GA.  
2008-2012 **Director**, Master of Arts in Teaching (MAT) Science, Kennesaw State University, Kennesaw, GA.  
2004-2009 **Assistant Professor**, Department of Chemistry and Biochemistry, Kennesaw State University, Kennesaw, GA.  
2002-2003 **Online AP Science (Physics, Statistics) Instructor**, Apex Learning.  
2002-2003 **Instructor**, College of Education, University of South Carolina.  
1998-2002 **Science Instructor**, Spring Valley High School, Columbia, SC.  
1995-1998 **Chemistry Teacher**, Lower Richland High School, Hopkins, SC.

1993-1994

**Chemist/Staff Scientist**, Alton Geoscience, Irvine, CA.

### **ADMINISTRATIVE PHILOSOPHY, VISION, AND STRATEGIC PLANNING NARRATIVE**

My approach to leading involves learning to see the system in which I'm operating in such a way that allows for the identification of strategic personnel, challenges, and opportunities to appropriately foreground the relevant features. Data collection, considering prospective actions and solutions, and building consensus usually follows an iterative process that seeks to achieve continuous improvement of programs, policies, and practices. I prioritize a servant leadership mindset for myself and with my teams, and seek outcomes that realize individual and groups' strengths that result in innovation and empowerment of our stakeholders.

### **LEADERSHIP POSITIONS AND MAJOR RESPONSIBILITIES/ACCOMPLISHMENTS**

#### **Director of Strategic Growth, 2021-2022, Office of Research, Middle TN State University**

- Developed our institution's first strategic plan for growth in research
- Established the first University Council on Sponsored Scholarship
- Initiated development of senior college-level administrative positions (Assoc. Dean of Research)
- Established an internal VP Research Advisory Board
- Directed and participated as mentor for the early career faculty research development program
- Design and oversight of monthly Office of Research trainings and workshops
- Oversight of internal grant program; annual research showcase; university research awards
- Initiated renegotiation of indirect cost rate agreement with external consulting firm
- Initiated negotiations for providing health care coverage for graduate students
- Authored and established new policies on extra compensation, pre-award spending, and postdoctoral hiring processes

#### **Director, TN STEM Education Center, 2018-present, Middle TN State University**

- Established Center as premier research entity at the institution
- Grew external grants and contracts to >\$1M annually
- Established Associate Director program for part-time faculty appointments in the Center
- Established a leadership development program for early and mid-career STEM faculty
- Established new staff positions for supporting grants and contract activity across campus
- Established a Director of Recruitment and Community Engagement

#### **Founding Director, 2008-2012, Master of Arts in Teaching (Science), Kennesaw State University**

- Developed curricula; recruited faculty; directed compliance reporting and student advising
- Recruited students; developed program assessments; managed practicum placements
- Directed development and funding efforts, both internally and externally
- Awarded largest NSF project in institution's history (\$2.85M in 2010) to support STEM teacher recruitment and retention

## GRANTS AND CONTRACTS

### **Externally Funded Projects as PI: (\$8.9M, 13 Projects)**

Collaborative Research: Exploring the Impact of Noyce Master Teaching Fellowship Programs on Teacher Retention: The Role of Motivation, Leadership, and School-Work Environment, **Rushton, GT**. [National Science Foundation \(NSF\) DUE-1949925](#), \$214,350, 2020-2023.

Collaborative Research: Investigating Classroom Discourse in Active Learning Environments for Large Enrollment Chemistry Courses, **Rushton, GT**. [National Science Foundation \(NSF\) DUE-1914813](#), \$609,435, 2019-2023.

“PDConnect: A Scalable Community Approach to Improving Instruction in AP Chemistry Nationwide”, **Rushton, GT** (Yaron, D.; Kulkarni, C.), [Institute of Education Sciences \(IES\) R305A180277](#), \$1,398,358. 2018-2021.

“Collaborative Research: Teacher Leadership (T-Lead): Investigating the Persistence and Trajectories of Noyce Master Teaching Fellows”, **Rushton, GT**. [National Science Foundation \(NSF\) DUE-1758342](#), \$282,065, 2018-2021.

“Collaborative Research: A Research Study of Teacher Retention and Network Formation in Noyce Communities of Practice”, **Rushton, GT** (Roehrig, G.; Ofem, B.; Sheppard, K.; Beeth, M.) [National Science Foundation \(NSF\) DUE-1660736](#), \$1,026,374, 2017-2020.

“Collaborative Research: Assessing the Longitudinal Impact of Noyce Awards on the Subject Matter Knowledge of Beginning STEM Teachers in the US: A Comparative Study”, **Rushton, GT** [National Science Foundation \(NSF\) DUE-1557292](#), \$132,380, 2016-2018.

"Recruiting and Retaining Teacher Leaders in Physics and Chemistry", **Rushton, GT** (Criswell, B.; Mzoughi, T.; Rosengrant, D.; Epps, A.; Whiting, D.) [National Science Foundation \(NSF\) DUE-1035451](#), \$2,841,528, 2011-2017.

"Northwest Georgia Math Science Partnership", **Rushton, GT** and Brown, T. (co-directors), Georgia Department of Education (GA-DOE), \$875,000, 2009-2011.

“Partnership for Reform in Chemistry Teaching II”, **Rushton, GT** (Brown, T.), US Department of Education, \$37,643, 2008-2009.

“Teacher Recruitment Initiative in Chemistry and Physics”, **Rushton, GT** (Dias M., Mzoughi T., Usselman M., Epps, A.) [National Science Foundation \(NSF\) DUE-0733830](#), \$899,601, 2007-2012.

“Northwest Georgia Science Education Partnership”, Brown, T. and **Rushton, GT** (co-directors), Georgia Department of Education (GA-DOE), \$632,064, 2007-2009.

“Partnership for Reform in Chemistry Teaching”, **Rushton, GT** (Brown, T.), US Department of Education, \$35,536, 2007-2008.

**Externally Funded Projects as Co-PI: ([\\$9.5M, 17 Projects](#))**

“Tennessee Digital Agriculture Center-An Integrated Non-formal Approach for Enhancing Youth Education”, (Cui, S., Mosley, C., Otter, R., **Rushton, GT**). US Department of Agriculture, [2021-67037-35972](#), \$749,924, 2021-2024.

“Inclusive Pedagogy among STEM Faculty: A Professional Development Program for Becoming Aware and Culturally Responsive”. (Bleiler-Baxter, S, Gardner, G., **Rushton, GT**). TN Board of Regents, May 2020-April 2021, \$50,000.

SUNY Excels, Charles Robbins (Nehm, R., **Rushton, GT**, McCarthy, R., Southerland, S.). The State University of New York. \$250,000, 2017-2019. {Subaward to chemistry, \$41,082}.

“HHMI Inclusive Excellence at Stony Brook University”. Ross Nehm (**Rushton, GT**, London, B, Southerland, S.). HHMI, \$1,000,000, 2017-2022.

“NSF Robert Noyce Program Regional Dialogue on Stimulating Research and Innovation for Pre-service Education of STEM Teachers in High-Need Schools”, Michelle Head (Criswell, BA, **Rushton, GT**, Rosengrant, D.). AAAS, \$65,000, 2017.

"The Pipeline to Teacher Preparation in Chemistry and Physics," Michelle L. Dean (Maurice Wilson, Meltem Alemdar, David Rosengrant, **Rushton, GT**). [NSF-DUE-1340019](#), \$1,198,577, 2013-2018.

“Integrating Quality Talk Professional Development to Enhance Professional Vision and Leadership for STEM Teachers in High-Need Schools” P. Karen Murphy (Brett A. Criswell, Jeffrey A. Greene, **Rushton GT**). [NSF-DRL-1316347](#), \$2,106,207, 2013-2016.

“Achieving Improvement in Math and Science Education II”. Hudson, D.; (**Rushton, GT**; Creel, S.; Brown, T.). Georgia Department of Education (GA-DOE), 2012-13, \$604,000.

“Northwest GA Math/Science Partnership”, Rosengrant, D. (Dean, M; **Rushton, GT**; Brown, T; Creel, S.; Fox, M.). Georgia Department of Education (GA-DOE), 2012-13, \$437,640.

“Achieving Improvement in Math and Science Education”, Hudson, D. (**Rushton, GT**; Creel, S.; Brown, T., Drake, J.), Georgia Department of Education (GA-DOE), 2011-13, \$1,089,364.

“Paulding/Harelson Counties Math Science Partnership”, (Fulghum, V.; Carter, R.; Brown, T.; **Rushton, GT**.; Shrago, M.), Georgia Department of Education (GA-DOE), 2009-11, \$600,000.

“Developing and Expanding Science and Math Educational Leaders (DESMEL)”, Hudson, D., (**Rushton, GT**, Wood, G.), Georgia Department of Education (GA-DOE), 2007-2009, \$538,887.

“Teacher Institute in Physical Science (TIPS)”, Mzoughi, T., (**Rushton, GT**), US Department of Education, \$25,406, 2007-2008.

“Mathematics and Science Partnership, Paulding County, GA” Hudson, D. (**Rushton, GT**, Wood, G.), Georgia Department of Education (GA-DOE), 2006-2007, \$248,000.

“SMATHematics III”, Brown, T., (**Rushton, GT**), US Department of Education, 2006-2007, \$34,999.

“Inquiry and Technology Professional Development Program”, Lotter, C. (Singer, J., **Rushton, GT**), South Carolina Commission on Higher Education, 2006-2010, \$587,500.

“Partnership for Reform in Science and Mathematics (PRISM) Satellite Grant”. Ukeje, I. (**Rushton, GT**, Brown, T, Wilson, M, Warner, M., Ouyang, J.), National Science Foundation (NSF), 2005-2007, \$235,635.

“SMATHematics II”, Brown, T., (**Rushton GT**), US Department of Education, 2005-2006, \$42,565.

#### **Externally Funded Projects as External Advisory Board Member:**

[PDMOST](#), NSF DRK12, Harvard Smithsonian Center for Astrophysics, PI: Philip Sadler, 2015-2019.

[Developing Computer Science Master Teachers for Georgia Rural Schools](#), Mercer University, PI: Tom Koballa, 2022-2027.

#### **Externally Funded Projects as External Evaluator:**

[“Recruit and Engage - Math And Science Teachers \(RE-MAST\) Noyce Program Phase II”](#), 2015-2020. C. McCartha, PI. External Evaluator on a five year, \$750,000 Phase II NSF Noyce Project. 2015-2019.

“Improving Chemistry Education for All”, 2012-13, M. Dean PI; D. Bromfield-Lee, co-PI. Designed, enacted, and reported upon the evaluation plan for a \$60,000 Improving Teacher Quality project which partnered KSU with five local school districts.

"Nature-Based Inquiry", 2010-12, B. Ely (PI). Designed, enacted, and reported upon the evaluation plan for a \$200,000 Improving Teacher Quality (ITQ) project in South Carolina which sought to implement nature-based curricula through the construction of outdoor classrooms in Georgetown County Schools.

"Middle School/Higher Education Partnerships in Science Education", 2007, (J. Singer, PI; C. Lotter, B. Feller, co-PIs). Reviewed project's activities and wrote summary report of the project's progress towards achieving their professional development goals with Lexington 2, Richland 1, and Sumter 2 School Districts on a \$117,500 yearlong project.

### **Internally Funded Proposals as PI:**

6. "Teaching Integrated Rate Laws without the Calculus", KSU Mentor-Protégé Award, Fall 2010, \$1700.
5. "Students' and Teachers' Conceptions of Chemical and Physical Changes", KSU Mentor-Protégé Award, Fall 2007, \$2100.
4. "Preparation of Novel Molecularly Imprinted Polymers for Selective Recognition of Aminosugars", KSU Faculty Incentive Grant, 2006-7, \$8000.
3. "Graduating Seniors' Conceptual Understanding of Fundamental Chemistry", KSU Mentor-Protégé Award, Fall 2005, \$1800.
2. "Enantioselective Recognition of Amino Acid Derivatives via Covalent Molecular Imprinting", KSU Mentor-Protégé Award, Fall 2005, \$2,478.
1. "Byproduct Removal Using Molecularly Imprinted Polymers", KSU Mentor-Protégé Program, Spring 2004, \$2000.

### **PUBLICATIONS (Google Scholar: h-index 16; i-index 26)**

#### **Refereed Journal Articles and Book Chapters:**

Accepted, In Press, or Published:

1. Rachel Ndembera, Herman E. Ray, Lisa Shah & Gregory T. Rushton (2022). Analysis of category level performance on the *Praxis*® earth and space science: Content knowledge test: Implications for professional learning, *Journal of Geoscience Education*, DOI: [10.1080/10899995.2022.2138067](https://doi.org/10.1080/10899995.2022.2138067)
2. Cortes, K. L., Reid, J. W., Fallin, R., Hao, J., Shah, L., Ray, H. E., & Rushton, G. T. (2022). A Longitudinal Study Identifying the Characteristics and Content Knowledge of Those Seeking Certification to Teach Secondary Biology in the United States. *CBE—Life Sciences Education*, 21(4), ar63. <https://doi.org/10.1187/cbe.21-08-0220>
3. Ekmekci, A., Aqazade, M., Callard, C., Gibson, D., Rushton, G.T., & McGraw, R. (accepted). The role of self-efficacy, leadership, school-work environment, diversity beliefs, and social network in teacher retention. *Proceedings of the 44th Conference of the North American Chapter of the Psychology of Mathematics Education*. Philadelphia, PA: PME.
4. Criswell, B., Smith, W., Gonczi, A., Ahrens, S., Yow, J., Lotter, C., Rushton, G.T., Polizzi, J. & Barth, S. (2022). Viewing STEM teacher leadership through a communities-of-practice lens. In Lauren M., Travis Y., & Betty C. (Eds.) *Research in practice: Preparing and retaining K-12 STEM teachers in high-need school districts* (pp. 355 – 395). American Association for the Advancement of Science. <https://doi.org/10.1126/aaas.add8007>
5. Reid, J. W., Hardee, A. B., Criswell, B. A., Elrod, M., Berryhill Jr, S. B., & Rushton, G. T. (2022). Empowering teacher leaders: The role of research in changing teacher leaders' sense of themselves as professionals. *International*

*Journal of Leadership in Education*. <https://doi.org/10.1080/13603124.2022.2045629>

6. Ofem, Brandon; Beeth, Michael; Doering, Jessica; Fink, Kathleen; Konz, Rebecca; Mohr-Schroeder, Margaret J.; Polizzi, Samuel J.; Roehrig, Gillian; Rushton, Gregory T.; and Sheppard, Keith (2022) "An Exploration of Communities of Practice in the STEM Teacher Context: What Predicts Ties of Retention?," *Journal of STEM Teacher Education*: Vol. 57: Iss. 1, Article 7. DOI: 10.30707/JSTE57.1.1664998343.920643. Available at: <https://ir.library.illinoisstate.edu/jste/vol57/iss1/7>
7. Yow, Jan A., Brett A. Criswell, Christine Lotter, Wendy M. Smith, Gregory T. Rushton, Paula Adams, Sally Ahrens, Anna Hutchinson, and Greysi Irdam. (2021). "Program attributes for developing and supporting STEM teacher leaders." *International Journal of Leadership in Education*, 1-24. <https://doi.org/10.1080/13603124.2021.2006794>
8. Reid, J. W., Gunes, Z. D. K., Fateh, S., Fatima, A., Macrie-Shuck, M., Nennig, H. T., Quintanilla, F., States, N. E., Syed, A., Cole, R., Rushton, G. T., Shah, L., & Talanquer, V. (2021). Investigating patterns of student engagement during collaborative activities in undergraduate chemistry courses. *Chemistry Education Research and Practice*. [Doi:10.1039/D1RP00227A](https://doi.org/10.1039/D1RP00227A)
9. Polizzi, S.J., Zhu, Y., Reid, J.W., Ofem, B., Salisbury, S., Beeth, M., Roehrig, G., Mohr-Schroeder, M., Sheppard, K. and Rushton, G.T. (2021). Science and mathematics teacher communities of practice: social influences on discipline-based identity and self-efficacy beliefs. *International Journal of STEM Education*, 8(1), 1-18. <https://doi.org/10.1186/s40594-021-00275-2>
10. Huang, R., Kimmins, D., Winters, J., & Rushton, G.T. (2020). [Does a technology assisted lesson study approach enhance teacher learning while eliminating obstacles of traditional lesson study?](https://doi.org/10.1186/s40594-021-00275-2) *Contemporary Issues in Technology and Teacher Education*, 20(4), 618-659.
11. Ofem, B., Polizzi, S.J., Rushton, G.T., Beeth, M., Couch, B., Doering, J., Konz, R., Mohr-Schroeder, M., Roehrig, G. and Sheppard, K. (2020). Looking at Our STEM Teacher Workforce: How to Model Self-Efficacy. *Economic Development Quarterly*, p.0891242420973758, <https://doi.org/10.1177/0891242420973758>
12. Jin, Y., Rodriguez, C. A., Shah, L., & Rushton, G. T. (2020). Examining the Psychometric Properties of the Redox Concept Inventory: A Rasch Approach. *Journal of Chemical Education*. <https://doi.org/10.1021/acs.jchemed.0c00479>
13. Ndembera, R., Hao, J., Fallin, R., Ray, H. E., Shah, L., & Rushton, G. T. (2020). Demographic factors that influence performance on the Praxis Earth and Space Science: Content Knowledge Test. *Journal of Geoscience Education*, 1-10. <https://doi.org/10.1080/10899995.2020.1813866>
14. Criswell, B. A., Rushton, G. T., & Shah, L. (2020). Exploring the Form and the Function: a Review of Science Discourse Frameworks in the Service of Research and Practice. *Research in Science Education*, 1-16. <https://doi.org/10.1007/s11165-020-09959-1>
15. Titu, P., Jiang, S., Perez, A.S., Gunes, B., Kulkarni, C., Zhu, W., Rushton, G.T. and Yaron, D.J. (2020). Making Lemonade out of Lemons: Supporting Adoption of Evidence-Based Practices in Response to Educational Disruptions. *Journal of Chemical Education*, 97(9), 3306-3311. <https://doi.org/10.1021/acs.jchemed.0c00818>
16. Shah, L., Butler Basner, E., Ferraro, K., Sajan, A., Fatima, A., & Rushton, G. T. (2020). Diversifying Undergraduate Chemistry Course Pathways to Improve Outcomes for At-Risk Students. *Journal of Chemical Education*. 97(7), 1822–1831. <https://doi.org/10.1021/acs.jchemed.9b00972>
17. Shah L, Jannuzzo C, Hassan T, Gadidov B, Ray HE, Rushton GT (2019). Diagnosing the current state of out-of-field teaching in high school science and mathematics. *PLoS ONE* 14(9): e0223186. <https://doi.org/10.1371/journal.pone.0223186>
18. Ofem, B., Polizzi, S.J., Rushton, GT, Beeth, M., Couch, B., Roehrig, G., Schroeder, M. and Sheppard, K. (2019, July). Gender Effects on Perceived Professional Mastery: Evidence from STEM Teachers. In *Academy of Management Proceedings* (Vol. 2019, No. 1, p. 14092). Briarcliff Manor, NY 10510: Academy of Management. <https://doi.org/10.5465/AMBPP.2019.93>

19. Polizzi, S. J., Ofem, B., Coyle, W., Lundquist, K., & Rushton, GT (2019). The use of visual network scales in teacher leader development. *Teaching and Teacher Education*, 83, 42-53.  
doi:<https://doi.org/10.1016/j.tate.2019.03.018>
20. Polizzi, S. J., Ofem, B., Coyle, W., Lundquist, K., & Rushton, G. T. (2019). Social Network Data from Teacher Leader Development. Data in Brief, 104182. doi:<https://doi.org/10.1016/j.dib.2019.104182>
21. Shah, L.; Schneider, J.; Fallin, R.; Linenberger Cortes, K.; Ray, HE.; Rushton, GT. (2018). What Prospective Chemistry Teachers Know about Chemistry: An Analysis of Praxis® Chemistry Subject Assessment Category Performance. *Journal of Chemical Education*, 95 (11), 1912-1921. DOI: [10.1021/acs.jchemed.8b00365](https://doi.org/10.1021/acs.jchemed.8b00365)
22. Criswell, BA; Rushton, GT; Nachtigall, D; Staggs, S. (2018). Strengthening the Vision: Examining the Internalization of a Framework for Teacher Leadership Development by Experienced Science Teachers. *Science Education*, 102(6), 1265-1287. DOI: [10.1002/sce.21472](https://doi.org/10.1002/sce.21472)
23. Alemdar, M; Cappelli, C; Criswell, B; Rushton GT. (2018). Evaluation of A Noyce Program: Development of Teacher Leaders in STEM Education. *Evaluation and Program Planning*. 71, 1-11.  
<https://doi.org/10.1016/j.evalprogplan.2018.06.005>
24. Polizzi, SJ; Head, M; Barrett-Williams, Donna; Ellis, J; Roehrig, G; Rushton, GT. (2018). The Use of Teacher Leader Roles in an Online Induction Support System. *Teaching and Teacher Education*, 75(10), 174-186.  
<https://doi.org/10.1016/j.tate.2018.06.010>
25. Shah, L.; Hao, J.; Rodriguez, C.; Fallin, R.; Linenberger-Cortes, K.; Ray, H.G.; Rushton, GT. (2018). Analysis of Praxis physics subject assessment examinees and performance: Who are our prospective physics teachers? *Physical Review Physics Education Research*, 14(1), 010126. DOI: [10.1103/PhysRevPhysEducRes.14.010126](https://doi.org/10.1103/PhysRevPhysEducRes.14.010126)
26. Shah, L; Rodriguez, C.; Bartoli, M.; Rushton, GT. (2018). Analyzing the Impact of a Discussion-Oriented Curriculum on First-year General Chemistry Students' Conceptions of Relative Acidity. *Chemistry Education Research and Practice*, 19, 543 - 557. DOI: [10.1039/C7RP00154A](https://doi.org/10.1039/C7RP00154A)
27. Shah, L.; Hao, J.; Schneider, J.; Linenberger, K.; Ray, H.E.; Rushton, GT. (2018). Repairing Leaks in the Chemistry Teacher Pipeline: A Longitudinal Analysis of Praxis® Chemistry Subject Assessment Examinees and Scores. *Journal of Chemical Education*, 95, 700-708. DOI: [10.1021/acs.jchemed.7b00837](https://doi.org/10.1021/acs.jchemed.7b00837)
28. Rushton, GT, Vik, E. C., Burns, W. G., Rasberry, R. D., & Shimizu, K. D. (2017). Guest control of a hydrogen bond-catalysed molecular rotor. *Chemical Communications*, 53 (92), 12469-12472. doi:[10.1039/C7CC07672J](https://doi.org/10.1039/C7CC07672J)
29. Rushton, GT; Rosengrant, D; Dewar, A; Ray, HE; Shah, L; Sheppard, K; Watanabe, L. (2017). Towards a high quality high school workforce: A longitudinal, demographic analysis of U.S. public school physics teachers. *Physical Review Physics Education Research*. 13(2): 020122.  
DOI:<https://doi.org/10.1103/PhysRevPhysEducRes.13.020122>
30. Ellis, JA; Roehrig, GH; Polizzi, SJ; Rushton, GT. (2017). Teachers as leaders: The impact of teacher leadership supports for beginning teachers in an online induction program. *Journal of Technology and Teacher Education*, 25(3), 245-272. OpenURL: <http://www.learntechlib.org/p/174193/>
31. Criswell, B. A., Rushton, G. T., McDonald, S. P., & Gul, T. (2017). A Clearer Vision: Creating and Evolving a Model to Support the Development of Science Teacher Leaders. *Research in Science Education*, 48(4), 811-837.  
doi.org/[10.1007/s11165-016-9588-9](https://doi.org/10.1007/s11165-016-9588-9)
32. Rushton, G. T., Dewar, A., Ray, H. E., Criswell, B. A., & Shah, L. (2016). Setting a Standard for Chemistry Education in the Next Generation: A Retrosynthetic Analysis. *ACS Central Science*, 2(11), 825-833. doi:  
[10.1021/acscentsci.6b00216](https://doi.org/10.1021/acscentsci.6b00216).
33. Adams, A.; Jessup, W.; Criswell, BA; Weaver-High, C; Rushton, GT. (2015). Using Inquiry To Break The Language Barrier in High School Chemistry Classrooms. *Journal of Chemical Education*, 92 (12), pp 2062–2066.  
[doi/10.1021/ed500837p](https://doi.org/10.1021/ed500837p)



34. Rushton, GT; Criswell, BA. (2015). Plugging the 'Leaky Bucket' of Early Career Science Teacher Attrition Through the Development of Professional Vision. In Luft, JA and Dubois, S. (Eds.) *Newly Hired Teachers of Science: A Better Beginning*. (pp. 87-98). Rotterdam:The Netherlands. Sense Publishers. ISBN: [9789463002820](https://doi.org/10.1093/biosci/biv093).
35. Polizzi, SJ; Jaggernauth, J; Ray, HG; Callahan, B; Rushton, G.T. (2015). Highly qualified or highly unqualified? A longitudinal study of America's public high school biology teachers, *Bioscience*, 65(8): 812-821.doi: [10.1093/biosci/biv093](https://doi.org/10.1093/biosci/biv093)
36. Dass, K.; Head, M.; Rushton, G.T. (2015). Building an understanding of how model-based inquiry is implemented in the high school chemistry classroom, *Journal of Chemical Education*, 92 (8), pp 1306-1314 doi: [10.1021/acs.jchemed.5b00191](https://doi.org/10.1021/acs.jchemed.5b00191)
37. Rushton, G. T., Ray, H. E., Criswell, B. A., Polizzi, S. J., Bearss, C. J., Levelsmier, N., Chhita, H. & Kirchoff, M. (2014). Stemming the Diffusion of Responsibility: A Longitudinal Case Study of America's Chemistry Teachers. *Educational Researcher*, 43: 390-403, DOI:[10.3102/0013189X14556341](https://doi.org/10.3102/0013189X14556341).
38. Hernández, G. E., Criswell, B. A., Kirk, N. J., Sauder, D. G., & Rushton, G. T. (2014). Pushing for particulate level models of adiabatic and isothermal processes in upper-level chemistry courses: a qualitative study. *Chemistry Education Research and Practice*, 15, 354-365, DOI:[10.1039/C4RP00008K](https://doi.org/10.1039/C4RP00008K).
39. Criswell, B. A., & Rushton, G. T. (2014). Activity Structures and the Unfolding of Problem-Solving Actions in High-School Chemistry Classrooms. *Research in Science Education*, 44(1), 155-188. DOI: [10.1007/s11165-013-9374-x](https://doi.org/10.1007/s11165-013-9374-x)
40. Lotter, C., Rushton, G. T., & Singer, J. (2013). Teacher Enactment Patterns: How Can We Help Move All Teachers to Reform-Based Inquiry Practice Through Professional Development? *Journal of Science Teacher Education*, 24(8), 1263-1291. DOI: [10.1007/s10972-013-9361-0](https://doi.org/10.1007/s10972-013-9361-0).
41. Rushton, G. T., Criswell, B. A., McAllister, N. D., Polizzi, S. J., Moore, L. A., & Pierre, M. S. (2013). Charting an Alternate Pathway to Reaction Orders and Rate Laws in Introductory Chemistry Courses. *Journal of Chemical Education*, 91(1), 66-73. DOI: [10.1021/ed3006743](https://doi.org/10.1021/ed3006743).
42. Rushton, G. T., & Criswell, B. A. (2013). Response to Johannsen, Rump, and Linder's Penetrating a wall of introspection: a critical attrition analysis. *Cultural Studies of Science Education*, 8(1), 117-126. DOI: [10.1007/s11422-012-9469-0](https://doi.org/10.1007/s11422-012-9469-0)
43. Rushton, G. T., & Shimizu, K. D. (2012). Molecularly Imprinted Polymers (MIPs) *Materials in Biology and Medicine* (pp. 77-90): CRC Press.
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45. Rushton, G. T., Lotter, C., & Singer, J. (2011). Chemistry teachers' emerging expertise in inquiry teaching: the effect of a professional development model on beliefs and practice. *Journal of Science Teacher Education*, 22(1), 23-52. DOI: [10.1007/s10972-010-9224-x](https://doi.org/10.1007/s10972-010-9224-x)
46. Brown, T., Rushton, G. T., & Van Haute, E. (2009). [Modeling Changes in Matter. Magnifying Interest in Science](https://doi.org/10.1007/s11422-012-9469-0). *Science Scope*, 32(5), 14-16.
47. Rushton, G. T., Hardy, R. C., Gwaltney, K. P., & Lewis, S. E. (2008). Alternative conceptions of organic chemistry topics among fourth year chemistry students. *Chemistry Education Research and Practice*, 9(2), 122-130. doi: [10.1039/B806228p](https://doi.org/10.1039/B806228p)
48. Rushton, G. T., Dias, M., & McDurmon, G. (2008). Enzyme Inquiry. *Science Teacher*, 75(6), 60-64.
49. Brown, T., Rushton, G., & Bencomo, M. (2008). Mighty Molecule Models. *Science and Children*, 45(5), 33-37.

50. Rushton, G. T., Burns, W. G., Lavin, J. M., Chong, Y. S., Pellechia, P., & Shimizu, K. D. (2007). Determination of the rotational barrier for kinetically stable conformational isomers via NMR and 2D TLC - An introductory organic chemistry experiment. *Journal of Chemical Education*, 84(9), 1499-1501. DOI: [10.1021/ed084p1499](https://doi.org/10.1021/ed084p1499)
51. Rushton, G. T., Karns, C. L., & Shimizu, K. D. (2005). A critical examination of the use of the Freundlich isotherm in characterizing molecularly imprinted polymers (MIPs). *Analytica Chimica Acta*, 528(1), 107-113. doi: [10.1016/j.aca.2004.07.048](https://doi.org/10.1016/j.aca.2004.07.048)
52. Rushton, G. T., Furmanski, B., & Shimizu, K. D. (2005). Plastic antibodies: Molecular recognition with imprinted polymers - An introductory polymer chemistry laboratory investigation. *Journal of Chemical Education*, 82(9), 1374-1377. DOI: [10.1021/ed082p1374](https://doi.org/10.1021/ed082p1374)
53. Lee, J. D., Greene, N. T., Rushton, G. T., Shimizu, K. D., & Hong, J. I. (2005). Carbohydrate recognition by porphyrin-based molecularly imprinted polymers. *Organic Letters*, 7(6), 963-966. doi: [10.1021/Ol047618o](https://doi.org/10.1021/Ol047618o)
54. Umpleby, R. J., Baxter, S. C., Rampey, A. M., Rushton, G. T., Chen, Y. Z., & Shimizu, K. D. (2004). Characterization of the heterogeneous binding site affinity distributions in molecularly imprinted polymers. *Journal of Chromatography B-Analytical Technologies in the Biomedical and Life Sciences*, 804(1), 141-149. doi: [10.1016/j.jchromb.2004.01.064](https://doi.org/10.1016/j.jchromb.2004.01.064)
55. Umpleby, R. J., Rushton, G. T., Shah, R. N., Rampey, A. M., Bradshaw, J. C., Berch, J. K., & Shimizu, K. D. (2001). Recognition directed site-selective chemical modification of molecularly imprinted polymers. *Macromolecules*, 34(24), 8446-8452. doi: [10.1021/Ma010903s](https://doi.org/10.1021/Ma010903s)

### **Invited Manuscripts**

1. Rushton, G. T. "Chemistry Teachers as Professionals: A Retrospective Analysis." (2016), *Journal of Chemical Education*, 93 (8),1335-1337 DOI:[10.1021/acs.jchemed.6b00447](https://doi.org/10.1021/acs.jchemed.6b00447)
2. Rushton, G. T. (2014). Introducing the Journal of Chemical Education's "Special Issue: Advanced Placement (AP) Chemistry". *Journal of Chemical Education*, 91(9), 1273-1275. DOI: [10.1021/ed500476r](https://doi.org/10.1021/ed500476r)
3. Rushton, G. T. (2013). From Occupation to Profession: A Perspective on the American Association of Chemistry Teachers. *Journal of Chemical Education*,91(1), 8-9. DOI: [10.1021/ed400764z](https://doi.org/10.1021/ed400764z)
4. Rushton, G. T., & Criswell, B. A. (2012). Cutting-Edge and Cross-Cutting: Connecting the Dots between Nanotechnology and High School Chemistry. *Journal of Chemical Education*, 89(10), 1217-1219. doi: [10.1021/ed300531k](https://doi.org/10.1021/ed300531k)
5. Rushton, G. T. (2012). What Do You Do? I Teach Chemistry! *Journal of Chemical Education*, 89(5), 563-564. doi: [10.1021/Ed300019g](https://doi.org/10.1021/Ed300019g)
6. Rushton, G. T. (2012). Improving High School Chemistry Teaching via the "Trickle Up" Effect: A Perspective on the New AP Chemistry Curriculum Framework. *Journal of Chemical Education*, 89(6), 692-693. doi: [10.1021/Ed300219m](https://doi.org/10.1021/Ed300219m)

### **TEACHING, SUPERVISION, & MENTORING**

#### **COURSES TAUGHT AT MIDDLE TENNESSEE STATE UNIVERSITY**

1. MSE 7500 DIRECTED RESEARCH IN MATHEMATICS AND SCIENCE EDUCATION (5)

2. MSE 7640 DISSERTATION RESEARCH (2)
3. CHEM 1110 GENERAL CHEMISTRY I (1)
4. CHEM 1111 GENERAL CHEMISTRY I LAB (1)
5. CHEM 3880 UNDERGRADUATE RESEARCH (4)

#### **COURSES TAUGHT AT STONY BROOK UNIVERSITY**

1. CSM 599, GRADUATE RESEARCH IN SCIENCE EDUCATION (3)
2. CSM 620, SCIENCE TEACHER EDUCATION (1)
3. CSM 635 QUALITATIVE RESEARCH IN SCIENCE EDUCATION (1)
4. CSM 640, DIRECTED STUDY IN SCIENCE EDUCATION (2)
5. CHE 152, MOLECULAR SCIENCE I, (2)
6. CHE 496 SENIOR RESEARCH (2)
7. CHE 589 DIRECTED STUDY (2)
8. CHE 599, RESEARCH IN CHEMISTRY (1)
9. CHE 596, TEACHING AND LEARNING CHEMISTRY (1)
10. SSO 102 FRESHMAN SEMINAR (SCIENCE AND SOCIETY) (2)

#### **COURSES TAUGHT AT KENNESAW STATE UNIVERSITY**

1. SCED/CHED 4415, TEACHING OF SPECIFIC SUBJECTS (TOSS)-SCIENCE, (6)
2. SCED/CHED 4475, STUDENT TEACHING SCIENCE, (5)
3. SCI 7900 THE HISTORY AND PHILOSOPHY OF CHEMISTRY, (1)
4. BIOL 4490 SCIENCE TEACHING RECONNAISSANCE, (1)
5. EDUC 7797 PORTFOLIO, (2)
6. CHEM 7950 GRADUATE DIRECTED STUDY (1)
7. CHEM 6750 ADVANCED PCK IN CHEMISTRY (1)
8. CHEM 1211, GENERAL CHEMISTRY I, (1)
9. CHEM 1212, GENERAL CHEMISTRY II, (8)
10. CHEM 1212L, GENERAL CHEMISTRY II LAB, (1)
11. CHEM 3362L, ORGANIC CHEMISTRY II LAB, (1)
12. CHEM 3400/5400, TEACHING AND LEARNING CHEMISTRY, (8)
13. CHEM 4100, DIRECTED STUDY, (15)
14. CHEM 4440, POLYMER CHEMISTRY, (1)
15. CHEM 7900, TEACHING AP CHEMISTRY, (2)

#### **Graduate/postgraduate Research Supervision:**

##### **Postdoctoral Adviser:**

1. Fatma Kaya, 2020-2021 [MTSU]

2. Joshua Reid, 2020-2022 [MTSU]
3. Preethi Titu, 2020 [MTSU]
4. Lisa Shah, PhD, 2016-2018 [Stony Brook]
5. S. Justin Polizzi, PhD, 2013-2017 [Kennesaw St.]

**Doctoral Adviser:**

1. Shaghayegh Fateh, 2019-2022[MTSU]
2. Andrea Reeder, 2020-present [MTSU]
3. Siying Jiang, (Ph.D., Applied Mathematics), 2018-2021. (co-adviser with Wei Zhu) [Stony Brook]
4. Thomas Scott, (Ph.D., Chemistry), 2018. [Stony Brook]
5. Dawn Nachtigall, (Ph.D., Science Education), 2015-2019. [Stony Brook]
6. Rachel Ndembera (Ph.D., Science Education), 2016-present. [Stony Brook]
7. Martin Palermo (Ph.D., Science Education), 2016-2018. [Stony Brook]
8. Kimberly Watson (Ph.D., Science Education), 2016-2018. [Stony Brook]
9. Monica Mattesi, (Ph.D., Science Education), 2015-2016. [Stony Brook]
10. John Sleckman, (Ph.D., Science Education), 2015-2016. [Stony Brook]
11. Christopher Kennedy, (Ed.D. Secondary Education-Chemistry), 2013-2015. [Kennesaw St.]
12. Cheree Vaughn, (Ed.D. Secondary Education-Chemistry), 2013-2015. [Kennesaw St.]
13. Lyric Portwood, (Ed.D. Secondary Education-Chemistry), 2013-2016. [Kennesaw St.]
14. Amanda Edwards, (Ed.D. Secondary Education-Chemistry), 2014-2015. [Kennesaw St.]

**Master's Thesis Adviser:**

1. Christian Rodriguez, (BS/MS, Chemistry Education), 2016-2018. [Stony Brook]
2. Kerry Bunyan, (MAT, Chemistry), 2016-2017. [Stony Brook]
3. Jeremy Schneider, (BS/MAT, Chemistry), 2016-2018. [Stony Brook]
4. Thomas Draghi, (MAT, Chemistry), 2016-2017. [Stony Brook]
5. Drew Adams, MAT-Chemistry, 2013 [Kennesaw St.]
6. Kevin Cameron, MAT-Chemistry, 2013 [Kennesaw St.]
7. Rebecca Mortensen, MAT-Chemistry, 2013 [Kennesaw St.]
8. Yolanda Payton, MAT-Chemistry, 2013, 2014 [Kennesaw St.]
9. Gabriel Hernandez, MAT-Chemistry, 2013, 2014 [Kennesaw St.]

**Undergraduate Research Supervision:**

1. Gabriella Cote, 2023 [MTSU]
2. Selvia Wagih, 2023 [MTSU]
3. Sylvia Zakher, 2022 [Honors Thesis Adviser] [MTSU]
4. Karolin Abouelyamin, 2021, 2022 [Honors Thesis Adviser] [MTSU]
5. Morgan Smith, 2019, 2020 [Honors Thesis Adviser] [MTSU]

6. Grace Millican, 2019, 2020 [MTSU]
7. Anika Chowdury, 2020 [MTSU]
8. Kenneth Ferraro, 2018 [Stony Brook]
9. Ashneel Raj, 2017 [Stony Brook]
10. Stephen Bruno, 2017 [Stony Brook]
11. Elle Butler Basner, 2016, 2017, 2018, 2019 [Stony Brook]
12. Maitreyee Kale, 2016 [Stony Brook]
13. Sydney Mansfield, 2013 [Kennesaw St.]
14. Kayla Bradley, 2012 [Kennesaw St.]
15. Michelle Pierre, 2011 [Kennesaw St.]
16. Lamesha Moore, 2011-12 [Kennesaw St.]
17. Nicole McAllister, 2010-11 [Kennesaw St.]
18. Eric Alford, 2009 [Kennesaw St.]
19. Michael Taylor, 2008 [Kennesaw St.]
20. Brittney Allen, 2008 [Kennesaw St.]
21. Taylor Blevins, 2007 [Kennesaw St.]
22. Aditya Patel, 2007 [Kennesaw St.]
23. William Maples, 2006-8 [Kennesaw St.]
24. Adam Stanley, 2006-7 [Kennesaw St.]
25. Rebecca Hardy, 2006 [Kennesaw St.]
26. Kendall Smart, 2005-6 [Kennesaw St.]
27. Amanda Conger, 2005-6 [Kennesaw St.]
28. Ayodeji Ajayi, 2005-6 [Kennesaw St.]
29. Angela Carmack, 2004-5 [Kennesaw St.]

**(Recent) Invited Talks and Keynote Addresses:**

1. **Promoting Equity and Access in Active Learning Chemistry Environments.** Invited talk at California State University-Los Angeles, Nov 2021.
2. **Professionalizing STEM Teaching in Secondary and Tertiary Settings: Studies to Influence Policy and Practice.** Invited talk at Clemson University, Nov 2019.
3. **Professionalizing STEM Teaching in Secondary and Tertiary Settings: Studies to Influence Policy and Practice.** Invited talk at the University of Alabama Birmingham, Oct 2019.
4. **Professionalizing STEM Teaching in Secondary and Tertiary Settings: Studies to Influence Policy and Practice.** Invited talk at the Chemistry Education Research and Practice Gordon Conference, June 2019.
5. **Chemical Thinking and Active Learning in Chemistry.** Invited talk at the University of Central Florida, February 12, 2018.
6. **Chemical Thinking and Active Learning in Chemistry.** Invited talk at SUNY Brockport, October 5, 2017.
7. **First Year Chemistry Students' Conceptions of Relative Acidity,** Invited talk at Trinity College Dublin, Dublin, Ireland. August 21, 2017.
8. **Master Teacher to Teacher Leader: The Opportunity and Challenge.** Keynote Address at the 2017 Annual New York Master Teacher Conference, SUNY Purchase, Aug 8, 2017.

9. **Analyzing the Impact of an Instructional Intervention on First-year General Chemistry Students' Conceptions of Relative Acidity.** Invited talk at Hunter College, New York, April 2017.
10. **Preparing T-shaped chemists: Using big ideas to understand and communicate chemistry.** Invited talk at the ACS National Meeting, San Francisco, CA, April 6, 2017.
11. **Strategic recruitment strategies to attract students into chemistry and physics education.** Dean, ML, Rushton, GT, Rosengrant, D, Criswell, B. (2014) Oral Session at the Midwest Regional Noyce Conference, Omaha, NE. October 2, 2014. (Regional).
12. **Electrochemistry...high school chemistry's neglected and overlooked treasure for teaching the big ideas of science.** Gregory T. Rushton, Keynote session at the 31<sup>st</sup> Annual High School-University Chemistry Teachers' Conference, November 11, 2012, CU Boulder, Boulder, CO. (State).
13. **"Harvesting the Not-So-Low Hanging Fruit into Noyce"**, Gregory T. Rushton and Beth B. Spencer, Oral presentation at the 2011 Midwest Regional Robert Noyce Conference, April 7-8, 2011, Indianapolis, IN. (Regional).
14. **"Recruiting and Preparing Chemistry Teachers at Kennesaw State University"**, Gregory T. Rushton, Oral presentation at the 2011 PhysTEC Conference, May 23-24, 2011, Austin, Texas. (National).

#### **Refereed Conference Presentations:**

**>150 at Regional/National/International Conferences since 2003**

#### **MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS (Past and Present)**

National Council of University Research Administrators (NCURA)

American Chemical Society (ACS)

National Association for Research in Science Teaching (NARST)

Association for Science Teacher Education (ASTE)

#### **HONORS, AWARDS, AND FELLOWSHIPS**

2013 KSU College of Science and Mathematics Distinguished Scholarship Award

2011 Georgia College Science Teacher of the Year (awarded by Georgia Science Teachers Assoc)

2007 KSU College of Science and Mathematics Distinguished Service Award

2004 Service Award, Most Declared Science Majors, KSU College of Science and Mathematics

2000 National Board Certification, Adolescent/Young Adult Science

#### **SELECTED SERVICE ROLES AND POSITIONS**

#### **Service to Professional Associations:**

American Chemical Society (ACS), Division of Chemical Education, ***Chemical Education Research Committee Member, 2009-17.*** The committee is responsible for organizing a Chemical Education Research Symposium at each national ACS meeting and the Biennial Conference on Chemical Education, providing workshops that introduce

theories and or methods of chemical education research, and for holding two meetings annually at which plans and topics for symposia are discussed, as are other items that can further the purpose of the committee.

Southeastern Association for Science Teacher Education (SASTE), **2009 President**. Responsible for organizing and hosting the annual conference of the largest regional section of the Association for Science Teacher Education (ASTE) at KSU in 2009.

National Science Foundation (NSF) **Noyce External Advisory Committee Member, 2009**. Responsible for providing leadership for the design of the annual PI conference.

National Association of Research in Science Teaching (NARST) **Outstanding Paper Award Committee Member, 2006-8**. Responsible for reviewing international conference papers for an annual award.

Association for Science Teacher Education (ASTE), **International Conference Proposal Reviewer, 2007, 2008; Thread Coordinator, 2013**. Reviewed submissions to the annual conference as part of the peer-review process for accepting proposals. (Invited)

American Chemical Society, 2007-8, **General Chemistry Exam Committee, member**. Responsible for writing, editing, and reviewing items for a national standardized exam in general chemistry. (Invited)

American Chemical Society (GA Section), 2005-6, **United States National Chemistry Olympiad State Coordinator (GA)**.