CURRICULUM VITAE

GREGORY T RUSHTON
Professor and TSEC Director
October 2021

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 EXPERIENCE

2021-	**Interim Co-Director for Strategic Growth**, Office of Research and Sponsored Programs, Middle Tennessee State University, Murfreesboro, TN
2018-present	**Director,** Tennessee STEM Education Center (TSEC), Murfreesboro, TN
2018-present	**Professor**, Department of Chemistry, 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.
08/2002-12/2003	**Online AP Science (Physics, Statistics) Instructor**, Apex Learning.
06/2002-08/2003	**Instructor**, College of Education, University of South Carolina.

08/1998-06/2002 **Science Instructor**, Spring Valley High School, Columbia, SC.
08/1995-07/1998 **Chemistry Teacher**, Lower Richland High School, Hopkins, SC.
07/1993-08/1994 **Chemist/Staff Scientist**, Alton Geoscience, Irvine, CA.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

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
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

TEACHING, SUPERVISION, & MENTORING

COURSES TAUGHT AT MIDDLE TENNESSEE STATE UNIVERSITY

1. MSE 7500 DIRECTED RESEARCH IN MATHEMATICS AND SCIENCE EDUCATION (4)
2. MSE 7640 DISSERTATION RESEARCH (1)
3. CHEM 1110 GENERAL CHEMISTRY I (1)
4. CHEM 1111 GENERAL CHEMISTRY I LAB (1)
5. CHEM 2880 UNDERGRADUATE RESEARCH (1)

COURSES TAUGHT AT STONY BROOK UNIVERSITY

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

COURSES TAUGHT AT KENNESAW STATE UNIVERSITY

1. CHEM 7950 Graduate Directed Study (1)
2. CHEM 6750 Advanced PCK in Chemistry (1)
3. CHEM 1211, General Chemistry I, (1)
4. CHEM 1212, General Chemistry II, (8)
5. CHEM 1212L, General Chemistry II Lab, (1)
6. CHEM 3362L, Organic Chemistry II Lab, (1)
7. CHEM 3400/5400, Teaching and Learning Chemistry, (8)
8. CHEM 4100, Directed Study, (15)
9. CHEM 4440, Polymer Chemistry, (1)
10. CHEM 7900, Teaching AP Chemistry, (2)
11. SCED/CHED 4415, Teaching of Specific Subjects (TOSS)-Science, (6)
12. SCED/CHED 4475, Student Teaching Science, (5)
13. SCI 7900 The History and Philosophy of Chemistry, (1)
14. BIOL 4490 Science Teaching Reconnaissance, (1)
15. EDUC 7797 Portfolio, (2)

Graduate/postgraduate Research Supervision:

Middle Tennessee State University, Doctoral Adviser**:**

1. Shaghayegh Fateh, 2019-present
2. Andrea Reeder, 2020-present

Middle Tennessee State University, Postdoctoral Adviser**:**

1. Fatma Kaya, 2020-present
2. Joshua Reid, 2020-present
3. Preethi Titu, 2020

Stony Brook University, Doctoral Adviser:

1. Siying Jiang, (Ph.D., Applied Mathematics), 2018-2021. (co-adviser with Wei Zhu)
2. Thomas Scott, (Ph.D., Chemistry), 2018.
3. Dawn Nachtigall, (Ph.D., Science Education), 2015-2019.
4. Rachel Ndembera (Ph.D., Science Education), 2016-present.
5. Martin Palermo (Ph.D., Science Education), 2016-2018.
6. Kimberly Watson (Ph.D., Science Education), 2016-2018.
7. Monica Mattesi, (Ph.D., Science Education), 2015-2016.
8. John Sleckman, (Ph.D., Science Education), 2015-2016.

Stony Brook University, Master's Thesis Adviser:

1. Christian Rodriguez, (BS/MS, Chemistry Education), 2016-2018.

2. Kerry Bunyan, (MAT, Chemistry), 2016-2017.
3. Jeremy Schneider, (BS/MAT, Chemistry), 2016-2018.
4. Thomas Draghi, (MAT, Chemistry), 2016-2017.

Stony Brook University, Postdoctoral Adviser:
1. Lisa Shah, PhD, 2016-2018.

Kennesaw State University, Postdoctoral Adviser:
1. S. Justin Polizzi, PhD, 2013-2017.

Kennesaw State University, Doctoral Adviser:
1. Christopher Kennedy, (Ed.D. Secondary Education-Chemistry), 2013-2015.
2. Cheree Vaughn, (Ed.D. Secondary Education-Chemistry), 2013-2015.
3. Lyric Portwood, (Ed.D. Secondary Education-Chemistry), 2013-2016.
4. Amanda Edwards, (Ed.D. Secondary Education-Chemistry), 2014-2015.

Kennesaw State University, Master's Research Adviser:
1. Drew Adams, MAT-Chemistry, 2013
2. Kevin Cameron, MAT-Chemistry, 2013
3. Rebecca Mortensen, MAT-Chemistry, 2013
4. Yolanda Payton, MAT-Chemistry, 2013, 2014
5. Gabriel Hernandez, MAT-Chemistry, 2013, 2014

Stony Brook University, Doctoral Program Committee Member. Responsible for advising, reviewing research proposals, serving on qualifying and comprehensive examination written and oral defense panels, and serving on dissertation review and defense panels.

1. Robyn Tornabene, (Ph.D., Science Education), 2017-present.
2. Donna Shapiro, (Ph.D., Science Education), 2017-present.
3. Rebecca Koelln, (Ph.D., Chemistry), 2015-2017..
4. Monaf Awwa, (Ph.D., Chemistry), 2015-present.
5. Linda Padwa, (Ph.D., Science Education), 2015-present.

University of South Carolina, Doctoral Program Committee Member.
1. Rafe Spraker, (Ph.D., Science Education), 2007-2010.
2. Randall LaCross, (Ph.D. candidate in Science Education), 2007-2010.
3. Laurie Taylor, (Ph.D., Science Education), 2013-2015.

Undergraduate Research Supervision:

At MTSU:

4. Karolin Abouelyamin, 2021 [Honors Thesis Adviser]
3. Morgan Smith, 2019, 2020 [Honors Thesis Adviser]
2. Grace Millican, 2019, 2020
1. Anika Chowdury, 2020

At Stony Brook University:

5. Kenneth Ferraro, 2018
4. Ashneel Raj, 2017
3. Stephen Bruno, 2017
2. Elle Butler Basner, 2016, 2017, 2018, 2019
1. Maitreyee Kale, 2016

At KSU:

17. Sydney Mansfield, 2013
16. Kayla Bradley, 2012
15. Michelle Pierre, 2011
14. Lamesha Moore, 2011-12
13. Nicole McAllister, 2010-11
12. Eric Alford, 2009
11. Michael Taylor, 2008
10. Brittney Allen, 2008
9. Taylor Blevins, 2007
8. Aditya Patel, 2007
7. William Maples, 2006-8
6. Adam Stanley, 2006-7
5. Rebecca Hardy, 2006
4. Kendall Smart, 2005-6
3. Amanda Conger, 2005-6
2. Ayodeji Ajayi, 2005-6
1. Angela Carmack, 2004-5

PUBLICATIONS

Refereed Journal Articles and Book Chapters:

Accepted, In Press, or Published:

1. 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

2. 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? *Contemporary Issues in Technology and Teacher Education*, 20(4), 618-659.
3. 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
4. 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
5. 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
6. 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
7. 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
8. 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
9. 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
10. 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.
11. 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
12. 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
13. 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
14. 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
15. 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

16. 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
17. 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
18. 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
19. 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
20. 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
21. 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. P*hysical Review Physics Education Research.* **13**(2): 020122. DOI:https://doi.org/10.1103/PhysRevPhysEducRes.13.020122
22. 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/*
23. 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
24. 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*.
25. 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
26. 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.
27. 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

28. 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
29. Rushton, G. T., Ray, H. E., Criswell, B. A., Polizzi, S. J., Bearss, C. J., Levelsmier, N., Chhita, H. & Kirchhoff, 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.
30. 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.
31. 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
32. 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.
33. 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.
34. 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
35. Rushton, G. T., & Shimizu, K. D. (2012). Molecularly Imprinted Polymers (MIPs) *Materials in Biology and Medicine* (pp. 77-90): CRC Press.
36. Criswell, B. A., & Rushton, G. T. (2012). Conceptual Change, Productive Practices, and Themata: Supporting Chemistry Classroom Talk. *Journal of Chemical Education, 89*(10), 1236-1242. doi: 10.1021/ed300078a
37. 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
38. Brown, T., Rushton, G. T., & Van Haute, E. (2009). Modeling Changes in Matter, Magnifying Interest in Science. *Science Scope, 32*(5), 14-16.
39. 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
40. Rushton, G. T., Dias, M., & McDurmon, G. (2008). Enzyme Inquiry. *Science Teacher, 75*(6), 60-64.
41. Brown, T., Rushton, G., & Bencomo, M. (2008). Mighty Molecule Models. *Science and Children, 45*(5), 33-37.
42. 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

43. 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
44. 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
45. 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
46. 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
47. 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

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
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
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
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
5. Rushton, G. T. (2012). What Do You Do? I Teach Chemistry! *Journal of Chemical Education, 89*(5), 563-564. doi: 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

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, $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.

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.

Pending Externally Funded Projects as PI/co-PI:

PRESENTATIONS

(Recent) Invited Talks and Keynote Addresses:

1. Clemson University November 2019
2. UAB October 2019
3. GRC CERP June 2019
4. **Chemical Thinking and Active Learning in Chemistry.** Invited talk at the University of Central Florida, February 12, 2018.
5. **Chemical Thinking and Active Learning in Chemistry.** Invited talk at SUNY Brockport, October 5, 2017.
6. **First Year Chemistry Students' Conceptions of Relative Acidity**, Invited talk at Trinity College Dublin, Dublin, Ireland. August 21, 2017.
7. **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.

8. **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.
9. **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.
10. **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).
11. **Electrochemistry…high school chemistry's neglected and overlooked treasure for teaching the big ideas of science.** Gregory T. Rushton, Keynote session at the 31st Annual High School-University Chemistry Teachers' Conference, November 11, 2012, CU Boulder, Boulder, CO. (State).
12. **"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).
13. **"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:

>100 at Regional/National/International Conferences since 2003

PROFESSIONAL SERVICE

KENNESAW STATE UNIVERSITY

University:

Professional Teacher Education Unit, Member, 2004-2012. *Responsible for implementing unit-level requirements and policies in the B.S. chemistry education and the Master of Arts in Teaching-Science programs.*

Program Coordinators (Undergraduate), Member, 2004-2012. *Responsible for collaborating between two colleges to ensure a high-quality program in chemistry teacher preparation.*

Program Coordinators (Graduate), Member, 2008-2012. *Responsible for collaborating between two colleges to ensure a high-quality program in science teacher preparation.*

Graduate Policies and Curriculum Committee, 2008-10. *Responsible for reviewing all policy and curricular changes in the graduate programs at KSU.*

College:

Member, College Tenure and Promotion Committee, 2010-2012. *Responsible for reviewing post-tenure review packages; required and elective tenure and promotion packages; and revising the College of Science and Mathematics' Tenure and Promotion Guidelines.*

Department or Program:

(**At Stony Brook University**):

2015-present

Chemistry Department:
Graduate Admissions Committee
Graduate Recruiting Committee (Chair 2016-18)
Education Committee (Chair 2017-18)

Institute for STEM Education:

Associate Director, PhD program in Science Education

(**At Kennesaw State University**):

Director, Master of Arts in Teaching (MAT) Science Program, 2008-2012. *Responsible for curriculum development, marketing, recruitment, advising, compliance reporting, course scheduling, admissions, policies, alignment of program to department, college, and university mission and strategic goals/initiatives.*

Program Coordinator, Undergraduate Chemistry Education Degree Track 2004-2010. *Responsible for recruitment, marketing, K-12 outreach, program development, advisement, curriculum design, program of study, collaboration/coordination between two colleges, and college, university, state, and national accreditation and compliance reporting.*

Chair, Departmental Tenure and Promotion Committee, 2009-10. *Responsible for coordinating the review of faculty members applying for tenure and/or promotion during the academic year 2009-10.*

Chair, Chemistry Education Search Committee 20045; 2006-7; 2008-9; 2009-10; 2010-11. *Lead several successful national searches for a chemistry education tenure-track faculty member in the Department of Chemistry and Biochemistry.*

Member, Undergraduate Curriculum Committee, Fall 2007-2010. *Responsible for reviewing, editing, and submitting curricular changes to departmental courses to appropriate audiences in the college and university.*

Member, Graduate Curriculum Committee, Fall 2007-present. *Responsible for initiating, writing, and approving curriculum changes to chemistry degree programs, including the MAT-Chemistry.*

Member, Graduate Admissions Committee, Spring 2008-present. *Responsible for receiving, assembling, reviewing, discussing, voting on, and completing decision forms for the applicant pool in the MAT-Science program for prospective chemistry, physics and biology teachers.*

Member, Departmental Awards Committee, 2006-7. *Responsible for nominating and reviewing applications for annual student departmental awards.*

General Chemistry Curriculum Committee Member, 2005-present. *Responsible for coordination of curriculum scope and sequence across the course sections in the department.*

Phi Lambda Upsilon (Beta Upsilon Chapter) Faculty Advisor 2005-2008. *Responsible for advising the leadership of the club and assisting coordination of induction ceremonies and service activities.*

State Coordinator, National Chemistry Olympiad, 2005, 2006. *Responsible for advertisement, contacting high schools, scheduling tutoring and testing sessions, and exam scoring and reporting.*

Co-adviser, Supplemental Instruction 2004, 2005. *Responsible for weekly meetings with the peer tutors and mentoring them in content and pedagogy.*

Co-organizer, Annual Advising Day, 2004, 2005. *Responsible for coordinating an annual departmental advising*

Member, Organic Chemistry Search Committee 2004. *Served on a committee that culminated in a successful hire of an organic faculty member.*

THE PROFESSION

Service to Journal:

Chemistry An Asian Journal, manuscript reviewer, *2017*
Physical Review Physics Education Research, manuscript reviewer, 2016-present
Journal of Chemical Education, manuscript reviewer, 2005-present.
Journal of Teacher Education, manuscript reviewer, 2009
Chemistry Education Research and Practice, manuscript reviewer, 2007-present
The Chemical Educator, manuscript reviewer, 2009, 2010
Instructional Science, manuscript reviewer, 2008
Journal of Chemical Education, Project ChemLab, member 2006-2009. Responsible for cataloging laboratory-based journal articles into a searchable database.

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).***

Other Manuscript or Proposal Reviewing Activities

1. National Science Foundation, DUE Grant Proposal Review Panel Chair, 2011; 2014
2. National Science Foundation, Math/Science Partnership Program, Grant Proposal Review Panel Member, 2008
3. National Science Foundation, Mathematics and Physical Sciences-EHR Proposal Reviewer, 2008; 2015
4. American Chemical Society-Petroleum Research Fund Grant Proposal Reviewer, 2007
5. Georgia Board of Regents (BOR)-Grant Proposal Reviewer for Title II Part B Improving Teacher Quality program, 2007, 2008 (Invited and accepted), 2009 (Invited and declined), 2010 (Invited and accepted).
6. GA-Dept. of Education, Math/Science Partnership Grant Proposal Review Board, 2006
7. GA-Professional Standards Commission Praxis II Panel Score Review Panel, 2005
8. Educational Testing Service (ETS)—Item writer, editor, and reviewer for Graduate Record Exam (Chemistry) and Praxis II (Chemistry) National Standardized Exams, 2005-6
9. Educational Testing Service (ETS)—Advanced Placement (AP) Chemistry Exam Reader 2006-present

THE COMMUNITY

Professionally-Related Service to the Community:

1. Georgia Dept. of Education, 2006-7, 8th grade physical science curriculum frameworks committee member and author, "Toys" unit, available online at: http://www.georgiastandards.org/scienceframework.aspx (Invited)

2. Georgia Dept. of Education, 2008, 8th grade physical science curriculum frameworks committee member, and author of "Chemistry of Climate" unit https://www.georgiastandards.org/Frameworks/Pages/BrowseFrameworks/Science6-8.aspx (Invited)

ADMINISTRATION AND LEADERSHIP (Roles not Included in the Professional Experience or Professional Service Sections)

Author, Master of Arts in Science (MAT-Science) proposal, 2007-2008. Responsible for authoring a proposal to initiate the first graduate program in the Department of Chemistry and Biochemistry, which included:

o establishing, coordinating, and mediating relationships and agreements between two colleges and three departments;

- establishing a course of study consistent with state and national standards and with existing KSU MAT programs
- shepherding the proposal and associated curriculum through department, college, university and state review panels
- Directing the recruitment, scheduling, advisement, and other logistics of the program
- Serving on a team of faculty and administrators to market the program locally and regionally through a multimedia campaign