Kirsti Kuenzel

Address Trinity College
Mathematics Department
300 Summit Street
Hartford, CT 06106

Email kirsti.kuenzel@trincoll.edu

Education and Qualifications

2014 **Ph.D.** Clemson University, Clemson, SC
Advisors: Wayne Goddard (Clemson) & Douglas Rall (Furman)
2009 **MS** Texas State University, San Marcos, TX
Advisor: Diana Gu
2005 **BS** University of Texas at Austin, Austin, TX

Appointments

July 2019 - Present **Assistant Professor of Mathematics**
Trinity College, Hartford, CT

Aug 2017 - July 2019 **Assistant Professor of Mathematics**
Western New England University, Springfield, MA

July 2014 - June 2017 **Harold L. Dorwart Visiting Assistant Professor**
Trinity College, Hartford, CT

May 2014 - Aug 2014 **Postdoctoral Researcher**
University of Johannesburg, South Africa

Publications

33. A. Domat and K. Kuenzel. Loop zero forcing and Grundy domination in planar graphs and claw-free cubic graphs, submitted (2022)
32. G. Bacsó, B. Brešar, K. Kuenzel, and D. F. Rall. Graphs with equal Grundy domination and independence number, submitted (2022)
31. S.E. Anderson, K. Kuenzel, and H. Schuerger. Graphs which satisfy a Vizing-like bound for the power domination of Cartesian products, submitted (2022)
30. S.E. Anderson, B. Brešar, S. Klavžar, K. Kuenzel, and D.F. Rall. Orientable domination in product-like graphs. *Discrete App. Math.*, accepted (2022)
29. K. Kuenzel and D.F. Rall. On independent domination in direct products. *Graphs and Combin.*, accepted (2022)
28. S.E. Anderson and K. Kuenzel. Power domination in cubic graphs and Cartesian products, *Discrete Math.*, **345**(11): 113113 (2022)
27. J.P. Georges, K. Kuenzel, D.W. Mauro, and P.S. Skardal. On a distance-constrained graph labeling to model cooperation, *Discrete App. Math.*, **306**: 17 - 31 (2022)
26. B. Brešar, K. Kuenzel, and D.F. Rall. Domination in digraphs and their products. *J. Graph Theory*, **99**(3): 359-377 (2022)
25. S.E. Anderson, K. Kuenzel, and D.F. Rall. On well-edge-dominated graphs. *Graphs and Combin.* **38**(106) (2022)

24. S.E. Anderson and K. Kuenzel. Independent transversal domination in trees, products, and under local changes to a graph, *Aequat. Math.*, **96**: 981-995 (2022)
23. S.E. Anderson, K. Kuenzel, and D.F. Rall. On well-dominated graphs. *Graphs and Combin.*, **37**(1): 151-165 (2021)
22. B. Brešar, B. Hartnell, M.A. Henning, D.F. Rall, and K. Wash. A new framework to approach Vizing's conjecture, *Discuss. Math. Graph Theory*, **41**(3): 749-762 (2021)
21. W. Goddard, K. Kuenzel, and E. Melville. Well-hued graphs, *Discrete App. Math.*, **320**: 370 - 380 (2022)
20. W. Goddard, K. Kuenzel, and E. Melville. Graphs in which all maximal bipartite subgraphs have the same order, *Aequat. Math.*, **94**: 1241-1255 (2020)
19. K. Kuenzel and D.F. Rall. On well-covered direct products, *Discuss. Math. Graph Theory*, **42**(2): 627-640 (2022)
18. B. Brešar, K. Kuenzel, and D.F. Rall. Graphs with a unique maximum open packing, *Indian Journal of Discrete Mathematics*, **5**(1): 37-55 (2019)
17. B.L. Hartnell, D.F. Rall, and K. Wash. On well-covered Cartesian products, *Graphs and Combin.*, **34**(6): 1259-1268 (2018)
16. S.E. Anderson, S. Nagpal, and K. Wash. Domination in the hierarchical product and Vizing's conjecture, *Discrete Math.*, **341**(1): 20-24 (2018)
15. B. Brešar, S. Klavžar, D.F. Rall, and K. Wash. Packing chromatic number versus chromatic and clique number, *Aequat. Math.*, **92**(3): 497-513 (2017)
14. B. Brešar, S. Klavžar, D.F. Rall, and K. Wash. Packing chromatic number, $(1,1,2,2)$-colorings, and characterizing the Petersen graphs, *Aequat. Math.*, **91**(1): 169-184(2017)
13. B. Brešar, S. Klavžar, D.F. Rall, and K. Wash. Packing chromatic number under local changes in a graph, *Discrete Math.*, **340**(5): 1110-1115 (2017)
12. M. Henning and K. Wash. Matchings, path covers and domination, *Discrete Math.*, **340**(1): 3207-3216 (2017)
11. D.F. Rall and K. Wash. On minimum identifying codes in some Cartesian product graphs, *Graphs and Combin.* **33**(4): 1037-1053 (2017)
10. J.P. Georges, D. Mauro, and K. Wash. On zero-sum $\mathbb{Z}_{2j}^k$-magic graphs, *J. Comb. Optim.*, **34**(1): 94-113 (2017)
9. S.E. Anderson, Y. Guo, A. Tenney, and K. Wash. Prime factorization and domination in the generalized hierarchical product, *Discuss. Math. Graph Theory*, **37**(4): 873-890 (2017)
8. P.S. Skardal and K. Wash. Spectral properties of the hierarchical product of graphs, *Physical Review E* **94**, 052311 (2016)
7. M. Henning and K. Wash. Trees with large neighborhood total domination number, *Discrete Applied Math*, **187**: 96-102 (2015)
6. W. Goddard, K. Wash, and H. Xu. WORM Colorings, *Discuss. Math. Graph Theory*, **35**: 571-584 (2015)
5. W. Goddard, K. Wash, and H. Xu. WORM colorings Forbidding Cycles or Cliques, *Congressus Numerantium* (2014)
4. K. Wash. Edgeless graphs are the only universal fixers, *Czech. Math.*, **64**(139): 833-843 (2014)
3. D. Rall and K. Wash. Identifying codes of the direct product of two cliques, *European Journal of Combinatorics*, **36**: 159-171 (2014)
2. W. Goddard and K. Wash. ID Codes in Cartesian Products of Cliques, *Journal of Combinatorial Mathematics and Combinatorial Computing*, **85**: 97-106 (2013)

1. W. Gu and K. Wash. Bounds on the domination number of permutation graphs, *Journal of Interconnection Networks*, **10**(3): 205-217 (2009)

Publications with Students

4. C. Cooper and K. Wash. t-tone colorings in the Cartesian product, *Congressus Numerantium* (2017)
3. A. Fong, J.P. Georges, D. Mauro, D. Spagnuolo, J. Wallace, S. Wang, and K. Wash. On the zero-sum group-magicness of Cartesian products, *Involve*, Vol. 12: 1261-1278 (2019)
2. J. Loe, D. Middlebrooks, A. Morris, K. Wash. 2-tone colorings in graph products, *Discuss. Math. Graph Theory*, **35**: 55 - 72 (2015)
1. J. Brown, A. Hasmani, L. Hiltner, A. Kraft, D. Scofield, K. Wash. On the computation of all characteristic p extensions of a p-adic field of a given degree, *Rocky Mountain Math Journal*, **45** No. 1 (2015)

Courses Taught

- **Combinatorics** - Spring 2020, Spring 2022
- **Abstract Algebra II** - Spring 2020
- **Graph Theory** - Spring 2017, Fall 2018, Fall 2020
- **Abstract Algebra I** - Fall 2015, Fall 2019, Fall 2021
- **Linear Algebra** - Fall 2015
- **Differential Equations** - Spring 2015
- **Statistical Data Analysis** - Fall 2019 and Spring 2020
- **Introductory Statistics** - Fall 2014
- **Calculus 1** - Fall 2016, Fall 2014, Fall 2013, Fall 2017, Fall 2018
- **Calculus 2** - Fall 2015, Spring 2015, Spring 2016, Spring 2018, Fall 2020, Fall 2021, Spring 2022
- **Business Calculus 2** - Spring 2013, Fall 2012, Spring 2012, Fall 2011, Spring 2011
- **Business Calculus 1** - Fall 2010
- **Pre-Calculus** - Spring 2017, Fall 2021
- **College Algebra** - Spring 2010
- **Math Business & Economics 1** - Spring 2010, Fall 2009
- **Pre-College Algebra** - Spring 2009, Fall 2008
- **Basic Math** - Spring 2008, Fall 2007

Undergraduate Research Advising

- Summer 2022 research advisee: Alex Domat
  Alex studied the grundy domination number and loop zero forcing number of particular graph classes.
- 2019/2020: I advised Div Gaur's senior thesis on power domination in cubic graphs and Cartesian products.
- 2018/2019: I advised Henry Wix's senior thesis project on solving combinatorial problems using integer programming.
- 2016/2017: Jack Wallace did an independent study on Algebraic Geometry and formulating combinatorial problems in the context of Algebraic Geometry. I also advised Catherine Cooper's senior thesis on t-tone colorings in the Cartesian product of graphs.

- Summer 2016 research advisees: Jacqueline Kromasch and Shriya Nagpal
  Jacqueline's Project: Using PCA, LDA, and k-means clustering to identify common manufacturing sources among 82 counterfeit pharmaceutical pills
  Shriya's Project: Improving upon the class of graphs that satisfy Vizing's Conjecture
  Shriya presented her work at MathFest and won the Cur Award for her presentation.
- Summer 2015 research advisees: Yaoqi Guo and Asa Tenney
  Project: Domination in the hierarchical product of graphs
  This project resulted in a publication. Asa presented his work at MathFest and won an Outstanding Presentation Award.
- Research Advisor: Clemson REU in Combinatorics, Computational Algebraic Geometry, and Number Theory (Summer 2013)
  Project: 2-tone colorings in graph products
  Student presentation at Southeast REU Conference
- Summer 2012 Clemson REU in Combinatorics, Computational Algebraic Geometry, and Number Theory Research Advisor
  Project: Classifying local fields of characteristic p
  Student presentation at Southeast REU Conference

Invited Talks

- "Vizing's conjecture 50 years later", Seminar in Center for Women in Mathematics Postbaccalaureate Program at Smith College (October 2015)
- "2-Tone Colorings in Graphs", Guy Jacobson Memorial Mathematics Colloquium Series at Converse College (November 2013)
- "Prime Factorization in the Generalized Hierarchical Product", Texas State Discrete Math Seminar (October 2013)
- "Edgeless Graphs Are The Only Universal Fixers", Clemson Mini-Conference (October 2013)
- "Identifying Codes in Graph Products", AMS Special Session on Graph Theory IV, Spring Southeastern Section Meeting (March 2013)

Service

- Organized a department colloquium for the math majors at Trinity 2014 - 2017
- Program Chair for the MAA Northeastern Section meeting hosted at Trinity in Fall 2016

Presentations

- "Power domination in cubic graphs", AMS Central Sectional Meeting (March 2022)
- "Well-hued graphs", Discrete Seminar at University of Maribor (October 2021)
- "Well-dominated graphs", CCSU Math Colloquium (September 2020)
- "Well-covered graph products", AMS Spring Southeastern Section Meeting (April 2019)
- "Well-dominated graphs", MAA Fall Northeastern Section Meeting (November 2018)
- "Well-covered Cartesian products", Discrete Seminar at University of Maribor (June 2017)
- "The packing chromatic number of subdivisions of subcubic graphs", Joint Mathematics Meetings (January 2017)
- "Edgeless graphs are the only universal fixers", 8th Slovenian Conference on Graph Theory (June 2015)
- "On a distance constrained labeling to model cooperation", 46^{th} Southeastern International Conference on Combinatorics, Graph Theory, and Computing (March 2015)

- "WORM Colorings of Graphs", 45^{th} Southeastern International Conference on Combinatorics, Graph Theory, and Computing (March 2014)
- "Prime factorization in the generalized hierarchical product", AMS Special Session on Trends in Graph Theory, Joint Mathematics Meetings (January 2014)
- S. Anderson and K. Wash, "Topology, Cantor sets, and t-tone colorings. Oh my!", Clemson Algebra and Discrete Math Seminar (September 2013)
- "Identifying Codes in Graphs", Furman Graph Theory Seminar (February 2013)
- "Identifying Codes in the Product of Cliques", AMS Session on Graph Theory II, Joint Mathematics Meetings (January 2013)
- "Domination, Identifying Codes, and Independence in Graph Products", Clemson Number Theory Seminar (November 2012)
- N. Calkin, K. James, and K. Wash, "How we spent our summer: The 2012 Clemson REU", Clemson Algebra and Discrete Math Seminar (September 2012)
- "Bounds on the Domination Number of Permutation Graphs", Furman Graph Theory Seminar (October 2010)
- "On the Domination Number of Permutation Graphs", CombinaTexas Conference (April 2009)

Honors and Awards

- Slovenia/USA Bilateral Research Grant 2016 - 2018
- Waitlisted for an AMS-Simons Travel Grant 2015
- AWM Travel Grant, March 2015 and June 2017