Kirsti Kuenzel

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Mathematics Department
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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

26. B. Brešar, K. Kuenzel, and D.F. Rall. Domination in digraphs and their products. *J. Graph Theory*, accepted (2021)
25. S.E. Anderson and K. Kuenzel. Independent transversal domination in trees, products, and under local changes to a graph, submitted (2021)
24. S.E. Anderson, K. Kuenzel, and D.F. Rall. On well-dominated graphs. *Graphs and Combin.*, **37**(1): 151-165 (2021)
23. 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)
22. J.P. Georges, K. Kuenzel, D.W. Mauro, and P.S. Skardal. On a distance-constrained graph labeling to model cooperation, *Discrete Applied Math.*, accepted (2021)
21. W. Goddard, K. Kuenzel, and E. Melville. Well-hued graphs, submitted (2020)
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*, to appear
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, submitted (2017)
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
- **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
- **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

- 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

- "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

- "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