

# Carl R. Yerger

Davidson College  
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## Education

- **Georgia Institute of Technology** Atlanta, GA  
*Ph.D. Algorithms, Combinatorics and Optimization* August 2006 - December 2010
  - Advisor: Robin Thomas, Thesis: Color-Critical Graphs on Surfaces
  - Minor in algorithms.
- **University of Cambridge** Cambridge, UK  
*Master of Advanced Study in Mathematics* 2005 - 2006
  - Graduated with Merit
  - Coursework included: Mathematics of Operational Research, Advanced Financial Models, Combinatorics, Probabilistic Combinatorics, Survival Analysis, Applied Statistics, Analytic Number Theory, Quasirandomness
  - Wrote essay about Graphs on Surfaces advised by Andrew Thomason
- **Harvey Mudd College** Claremont, CA  
*B. S. Mathematics* 2001 - 2005
  - Graduated with high distinction with honors in Mathematics and the Humanities and Social Sciences.
  - GPA 3.957, humanities concentration in Economics, 4-year varsity tennis letter-winner.
- **Owen J. Roberts High School** Pottstown, PA  
*High School* 1997 - 2001
  - Valedictorian, GPA 101.43%, SAT: 1590

## Academic Employment

- **Davidson College** Davidson, NC  
*Assistant Professor of Mathematics* August 2010 - Present
  - Courses Taught: Calculus III, Graphs and Combinatorics, Design and Analysis of Algorithms, Seminar in Game Theory/Mathematical Finance

## Publications (available at [www.carlyerger.com](http://www.carlyerger.com))

1. P. Britton, C. Yerger, Coarse scoring measures in college basketball, manuscript.
2. D. Bernstein, D. Gryniewicz, C. Yerger, On three sets with nondecreasing diameter, manuscript.
3. R. Thomas, C. Yerger, Steinberg's conjecture and higher surfaces, manuscript.
4. K. Kawarabayashi, C. Yerger, A short proof for color-critical graphs on surfaces, manuscript.
5. L. Postle, N. Streib, C. Yerger, Pebbling graphs of diameter three and four, submitted, J. Graph Theory.

6. N. Chenette, L. Postle, N. Streib, R. Thomas, C. Yerger, Five coloring graphs on the Klein bottle, submitted, *Journal of Combinatorial Theory, Series B*.
7. N. Watson and C. Yerger, Domination Cover Pebbling: Structural Results, *J. Combin. Math. Combin. Comput.* **72** (2010), 181-196.
8. A. Benjamin, N. Cameron, J. Quinn, C. Yerger, Catalan determinants A combinatorial approach, to appear, *Applications of Fibonacci Numbers 11*, (William Webb, ed.), Utilitas Mathematica Publishing Co., Winnipeg, 2009.
9. A. Godbole, N. Watson and C. Yerger, Threshold and complexity results for the cover pebbling game, *Discrete Mathematics*, **309** (2009), 3609-3624.
10. A. Shiu and C. Yerger, Rabbits Redux: The cube root of four and the Fibonacci sequence, *Mathematical Spectrum* (2009).
11. J. Gardner, A. Godbole, A. Teguaia, A. Vuong, N. Watson and C. Yerger, Domination cover pebbling: Graph Families, *J. Combin. Math. Combin. Comput.* **64** (2008), 255–271.
12. N. Watson and C. Yerger, Cover pebbling numbers and bounds for certain families of graphs, *Bull. Inst. Combin. Appl.* **48** (2006), 53–62.
13. A. Benjamin and C. Yerger, A combinatorial interpretation of the wheel graph, *Bull. Inst. Combin. Appl.* **47** (2006), 37–42.
14. C. Yerger, Monochromatic and zero-sum sets of nondecreasing diameter, manuscript, available on ArXiv, 2006.

### Refereed Conference Proceedings (available at [www.carlyerger.com](http://www.carlyerger.com))

1. L. Postle, N. Streib, C. Yerger, Pebbling graphs of diameter three and four, *Electronic Notes in Discrete Mathematics* **34** (1 August 2009) 21–28, European Conference on Combinatorics, Graph Theory and Applications (EuroComb 2009).
2. N. Chenette, K. Kawarabayashi, D. Kral, J. Kyncl, B. Lidicky, L. Postle, N. Streib, R. Thomas and C. Yerger. Six-critical graphs on the Klein bottle, *Electronic Notes in Discrete Mathematics* **31** (2008), 235–240.
3. A. Godbole, N. Watson, and C. Yerger, Cover pebbling thresholds for the complete graph, *Electronic Notes in Discrete Mathematics*, **22** (2005) 301–304.

### Teaching Experience outside Davidson

- **Lead Instructor** Math 3012: Applied Combinatorics  
*Student evaluation in top third in College of Sciences* *May 2009 - July 2009*
- **Completed CETL 8803: Fundamentals of Teaching and Learning** Georgia Tech  
*Designed and planned entire course in this class* *Jan. 2009 - May 2009*
- **Teaching Assistant** Math 1711: Finite Math  
*Graduate Teaching Assistant* *Aug 2008 - Dec 2008*

- **TA/ Counselor** Pennsylvania Governor's School for the Sciences  
*Carnegie Mellon University* June 2005 - July 2005  
Assisted in teaching, grading and tutoring courses in discrete mathematics and problem solving.  
Advised a group of students in a team project involving mathematics and social anthropology.
- **Junior Staff** Hampshire College Summer Studies in Mathematics  
*Lectured daily to class of 15 gifted HS students* June 2002 - Aug. 2002  
Lectured around an hour per day to a class of fifteen gifted high school students. Taught an 8-lecture mini-course (1.5 hours per lecture) on Fibonacci identities, sums and combinatorial proofs.
- **Private Tutor** Varies  
*Tutored Math and Science to Middle School through College Students* 2000 - Present

### Awards, Scholarships, Honors and Fellowships

- Mathematical Association of America Project NExT Fellow 2011-2012.
- Georgia Tech School of Mathematics John Festa Fellowship (\$900) in May 2009. This award is based upon scholarship and leadership.
- First place oral presentation, Georgia Tech Graduate Student Research Conference, (\$75).
- Best student speaker prize (\$200) from my presentation "Five-coloring graphs on the Klein bottle" in March 2008 at the SIAM southeastern section conference, Orlando, FL.
- President's Fellowship for the Georgia Institute of Technology, September 2006 - June 2010 (\$5500 per year supplement).
- National Science Foundation Graduate Research Fellowship, offering \$30,000 of financial support for graduate study annually for three years beginning Fall 2006.
- Winston Churchill Foundation Scholarship, fully supported my studies at Cambridge University during the 2005-2006 academic year (approximately \$45,000).
- Barry M. Goldwater scholarship in 2003, providing \$7500 of financial support for each of my junior and senior years of college.
- Interview nominee for a Marshall Scholarship in the Los Angeles Region, 2005.
- Pennsylvania State Finalist for the Rhodes Scholarship, 2005.
- Harvey Mudd College Nova Scholarship, a four-year half-tuition merit scholarship.
- Scholarships: James R. Hoffa Memorial Scholarship (\$10,000), AAA Safety Patrol Scholarship (\$4000), Marjorie A. Maack Memorial Scholarship (\$600), Pennsylvania Elks State Scholarship (\$500) and the Comcast Leaders of Tomorrow Scholarship (\$1000).
- Intercollegiate Tennis Association Scholar-Athlete, NCAA Division III, 2003-2004 and 2004-2005.
- Mentioned along with Arthur Benjamin, in George Andrews' *Integer Partitions* textbook for helping to edit a draft of the text.

### Mathematical Service

- Organizer, three-session mini-symposium on Graph Theory, SIAM Southeastern Section Conference, UNC-Charlotte, March 26-27, 2011.
- Organizer, March MATHness buzzer tournament, Davidson College, February 19, 2011.
- Assistant Organizer, Charlotte Mathematics Club, Charlotte, NC, 2010-present.
- Referee for Discrete Mathematics, Ars Combinatoria, Discrete Applied Mathematics, Utilitas Mathematica, Methodology and Computing in Applied Probability.
- Organizer, Georgia Tech High School Math Competition (am responsible for writing the seven tests administered during the competition, which involves over 400 high school students), 2009 and 2010 competitions. I assisted in other capacities in 2007 and 2008.
- Grader, Georgia ARML (American Regions Math League) 2009-2010.
- Member of SIAM and MAA since 2003, and member of the AMS since 2005.
- Member of the Institute for Combinatorics and its Applications since 2005.

### University Service

- Davidson College Graduate Fellowships Committee, 2011-present.
- Georgia Tech Graduate Student Government, Executive Vice President 2007-2008 academic year. Presided over weekly senate meetings, student government at Georgia Tech works with a student activity fee budget totaling 3-4 million dollars, responsible for picnic with over 1700 graduate students attending.
- Georgia Tech Technology Fee Advisory Committee member. Rates proposals for an approximately five million dollar technology fee fund, 2007-present.
- Georgia Tech Mandatory Student Fee Advisory Committee member, 2007-2010. Submits recommendations to the president for all five mandatory student fees.
- Georgia Tech Churchill Scholarship Nominating Committee member, 2006-2010. Selects Georgia Tech nominees for national competition for Winston Churchill Foundation scholarships.
- Georgia Tech Graduate Student Government, Communications Chairperson, 2009-2010.
- Georgia Tech Graduate Student Government, Senator, Spring 2007, Fall 2008-Spring 2010.

### Presentations (in chronological order)

- *Solution to American Mathematical Monthly problem 10901*. Southern California AMS/MAA meeting's poster session, Claremont, CA, Spring 2003
- *Monochromatic and zero-sum sets of nondecreasing diameter*, Hampshire College Summer Studies in Mathematics, Amherst, MA, Summer 2003.
- *Monochromatic and zero-sum sets of nondecreasing diameter*, Incoming Freshmen On-Campus Day, Harvey Mudd College, Claremont, CA, Spring 2004.

- *Domination cover pebbling*, National AMS/MAA meetings, Atlanta, GA, Combinatorics I session, Winter 2004.
- *Probabilistic and combinatorial results concerning deep graphs*, National AMS/MAA meetings, Atlanta, GA, Combinatorics IV session, Winter 2004.
- *Cover pebbling thresholds for the complete graph*, International Colloquium of Graph Theory, Heyers, France, September 2005.
- *Extensions of graph pebbling*, Combinatorics Seminar, Georgia Institute of Technology, Atlanta, GA, January 2006.
- *Six-regular graphs on the Klein bottle*, Graph Theory Seminar, Georgia Tech, Atlanta, GA, Jan 17, 2008.
- *Pebbling graphs of diameter three*, Georgia Tech Graduate Student Government Research Symposium, Atlanta, GA, March 2008.
- *Pebbling graphs of diameter three*, Southeastern Conference on Graph Theory, Combinatorics and Computing, Boca Raton, FL, March 5, 2008.
- *Five-coloring graphs on the Klein bottle*, SIAM-Southeastern Section Conference, Special Session on Graph Theory, University of Central Florida, Orlando, FL, March 16, 2008, invited presentation.
- *Pebbling graphs of diameter three*, Poster Presentation, New Directions in Algorithms, Combinatorics and Optimization, Georgia Tech, Atlanta, GA, May 2008.
- *Pebbling graphs of diameter three*, Cumberland Conference, honoring Mike Plummer, Vanderbilt University, May 17, 2008.
- *Five-coloring graphs on the Klein bottle*, Netherlands Workshop on Graphs and Matroids, Sittard, Netherlands, July 20, 2008, invited presentation.
- *Pebbling graphs of diameter four*, Georgia Tech Graph Theory Seminar, Atlanta, GA, December 2008.
- *Five-coloring graphs on the Klein bottle*, Georgia Tech Graduate Student Government Research Symposium, Atlanta, GA, March 2009.
- *Research Proposal: Steinberg's conjecture and its extensions*, ACO Program Research Proposal Presentation, Georgia Tech, Atlanta, GA, May 2009.
- *Pebbling Graphs of Diameter Three and Four*, European Conference on Combinatorics, Graph Theory and Applications (EuroComb 2009), University of Bordeaux, Bordeaux, France, September 2009, accepted for presentation by program committee.
- *Color-Critical graphs on surfaces* Discrete Mathematics Seminar, Clemson University, January 28, 2010.
- *Color-Critical graphs on surfaces* SIAM Conference on Discrete Mathematics, Austin, TX, June 15, 2010.
- *Steinberg's conjecture and higher surfaces*, 2nd Netherlands Workshop on Graphs and Matroids, Maastricht University, Netherlands, August 3, 2010.
- *Steinberg's conjecture and higher surfaces* Special Session on New Directions in Graph Theory, Joint Mathematics Meetings, New Orleans, LA, January 2011.

- *Steinberg's conjecture and higher surfaces*, SIAM Southeastern Section Conference, UNC-Charlotte, March 26-27, 2011.
- *Steinberg's conjecture and higher surfaces* MAA Section Meeting, Tuscaloosa, Alabama, April 1, 2011
- *Reading questions: pedagogical differences between educational environments*, MAA Section Meeting, Tuscaloosa, Alabama, April 1, 2011.
- *On three sets with nondecreasing diameter* Cumberland Conference on Graph Theory, Combinatorics and Computing, University of Louisville, Louisville, KY, May 2011.
- *Steinberg's conjecture and higher surfaces*, Weekly seminar, Institute for Theoretical Computer Science, Charles University, Prague, Czech Republic, June 2011.

## Other Research Experience

- **Internship** National Institute for Informatics, Advisor: Ken-ichi Kawarabayashi  
*Tokyo, Japan* Aug. 2009-Sept. 2009
- **REU Program** East Tennessee State University, Johnson City, TN  
*Probability and Graph Theory* June 2004-July 2004
- **REU Program** University of Idaho, Moscow, ID  
*Combinatorics* June 2003-July 2003

## Conferences Attended (in chronological order)

- Southern California AMS/MAA meeting's poster session, Claremont, CA, Spring 2003.
- National AMS/MAA meetings, Atlanta, GA, Winter 2004.
- Euler Institute for Discrete Mathematics and its Applications, minicourse on structural graph theory, Technische Universiteit Eindhoven, The Netherlands, June 2005.
- International Colloquium of Graph Theory, Heyers, France, September 2005.
- Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Topological graph theory and crossing numbers, Banff, Canada October 2006.
- ADONET-CIRM School on Graphs and Algorithms. Levico Terme, Trento, Italy, October 2007.
- Georgia Tech Graduate Student Government Research Symposium, Atlanta, GA, March 2008.
- Southeastern Conference on Graph Theory, Combinatorics and Computing, Boca Raton, FL, March 2008.
- SIAM-Southeastern Section Conference, Special Session on Graph Theory, University of Central Florida, Orlando, FL, March 2008.
- Cumberland Conference, honoring Mike Plummer, Vanderbilt University, May 2008.
- New Directions in Algorithms, Combinatorics and Optimization, a conference at Georgia Tech honoring the 65th birthday of Tom Trotter, Georgia Tech, Atlanta, GA, May 2008.

- Netherlands Workshop on Graphs and Matroids, Sittard, Netherlands, July 2008.
- Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Canada, Graph Minors, October 2008.
- Georgia Tech Graduate Student Government Research Symposium, Atlanta, GA, March 2009.
- EuroComb 2009: European Conference on Combinatorics, Graph Theory and Applications, Bordeaux, France, September 2009.

## Other Activities

- **Tennis:** During the 2005-2006 academic year, I played for the Cambridge University men's tennis second team. I played at positions ranging from #1 to #4 and during the Varsity match against Oxford's second team. From 2001-2005, I played for the Claremont-Mudd-Scripps Stags men's tennis team. During 2003-2004, the team was ranked as high as #2 nationally in NCAA Division III, with an undefeated record during the regular season within Division III. While on the team, I participated mostly as a reserve, but amassed a career league record of 9-1.
- **Bowling:** I am the president and co-founder of the Georgia Tech Bowling Club. My average is approximately 215. I am also a United States Bowling Congress Bronze certified coach. My high three-game series is 792, and my highest sanctioned game is 290. (However, I have bowled two perfect games outside sanctioned competition.)
- **Korfball:** During the 2005-2006 academic year, I played for the Cambridge University Korfball Team. For my participation in the korfball Varsity match against Oxford, I earned a half-blue. In addition, during Summer 2006, I played for the United States Korfball Team at the Commonwealth and Friends Tournament in London and had six international appearances. Currently, I serve on the United States Korfball Federation National Executive Board and play for the US National Korfball Team.
- **Duplicate Bridge:** I was a co-president of Harvey Mudd College's Bridge Club for the 2004-2005 academic year and was responsible for the day-to-day organization of the club. I have played bridge since 2001 and currently play in bridge tournaments in the Atlanta and Charlotte area.
- **Music:** I played drum set for Professor Robert Keller's Jazz Ensemble at Harvey Mudd and have been part of the group from Spring 2004 to Spring 2005. In addition, I played drums and percussion through high school.
- **Volunteer Work:** Since 1995, I have been a bingo volunteer at the North Coventry Fire Company, Pottstown, PA. Since 1999, I have worked intermittently as a bingo caller. I also, when home, volunteer at the fire company's annual carnival.