

Scott A. Cook

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Education

Washington University in St. Louis, St. Louis, Missouri

- **Ph.D. Mathematics**, May 2011
 - Dissertation Topic: “Markov Chains Derived From Lagrangian Mechanical Systems”
 - Advisor: Renato Feres
- **M.A. Mathematics**, August 2007

Southern Nazarene University, Bethany, OK, 1998-2002

- **B.S. Summa Cum Laude**, Physics and Chemistry, May 2002
- **B.S.**, multidisciplinary - Mathematics, Psychology, Philosophy, December 2002

Professional Experience

Visiting Assistant Professor, Swarthmore College, August 2011-present

Adjunct Professor of Mathematics, Washington University in St. Louis, Summer 2011

Graduate Student/Teaching Assistant/Research Assistant, Washington University in St. Louis, Fall 2004-Spring 2011

Systems Engineer II, Raytheon Company, Missile Systems Division, June 2002 - July 2004

- Reliability Engineer/Risk Manager, Tomahawk Cruise Missile 2003-2004
- Advanced Manufacturing Design - 2002

Research Experience for Undergraduates

- University of Rochester, Chemistry, Udo Schröder, Summer 2001
- University of Memphis, Chemistry, Ted Burkey, Summer 2000
- Arizona State University, Materials Research Science and Engineering Center, C. Austen Angell, Summer 1999

Tutor & Lab Assistant, 1998-2002, Southern Nazarene University

Teaching

Swarthmore College - Visiting Assistant Professor of Mathematics

Courses Taught

- *Math 53, Stochastic Modelling*, Spring 2015 (scheduled)
- *Math 28, Honors Linear Algebra*, Spring 2015 (scheduled)
- *Stat 11, Statistical Methods*, Fall 2014
- *Math 34, Several Variable Calculus (assuming linear algebra)*, Fall 2014
- *Stat 11, Statistical Methods*, Spring 2014
- *Directed Reading, Spectral Graph Theory and Stochastic Processes on Graphs*, Spring 2014
- *Math 63, Real Analysis*, Fall 2013
- *Math 27, Linear Algebra*, Fall 2013
- *Math 35, Honors Several Variable Calculus*, Spring 2013
- *Math 27, Linear Algebra*, Spring 2013

- *Math 27, Linear Algebra*, Fall 2012
- *Math 34, Several Variable Calculus (assuming linear algebra)*, Spring 2012
- *Math 43, Basic Differential Equations*, Spring 2012
- *Math 25, Further Single Variable Calculus*, Fall 2011
- *Math 33, Basic Several Variable Calculus (not assuming linear algebra)*, Fall 2011

Other Activities

- Putnam practice and exam organizer 2013-present
- WebWork Coding Workshop, June 13, 2012
- Website manager 2012-present

Washington University in St. Louis - Graduate Student

- Teaching Citation, Graduate School of Arts and Sciences, December, 2010
- Dean's Award for Excellence in Teaching, Grad School of Arts & Sciences, 2007
- Math Education Discussion Group, participant, Summer 2005

Courses Taught

- *Math 1011, Introduction to Statistics*, Summer 2011
- *Math 130, Calculus I for Freshman Summer Academic Program*, Summer 2008
- *Math 130, Calculus I for Freshman Summer Academic Program*, Summer 2007
 - FSAP is a five week, on campus summer enrichment program for incoming freshmen
- *Math 220, Finite Mathematics*, Summer 2006 - team taught with Michael Brad Henry

Teaching Assistant: Duties included leading recitation sections, grading quizzes and exams, and holding office hours.

- *Math 131, Calculus I*, Fall 2008
- *Math 217, Differential Equations*, Fall 2007
- *Math 233, Multivariable Calculus*, Spring 2007
- *Math 128, Calculus II for the Life, Social, and Managerial Sciences*, Spring 2006
- *Math 132, Calculus II*, Spring 2006
- *Math 131, Calculus I*, Fall 2005

Grader: Duties included grading homework sets.

- *Math 418, Introduction to Topology and Modern Analysis II*, Spring 2010
- *Math 5042, Geometry II (Graduate qualifier in Riemannian Geometry)*, Spring 2010

Research Interests

- Probability theory and stochastic processes
- Mathematical physics
- Random dynamical systems

Papers

- *Stochastic Motion of Thermally Active Particles*, with Tim Chumley and Renato Feres, in preparation
- *From Billiards to Thermodynamics*, with Tim Chumley and Renato Feres, *Computers and Mathematics with Applications*, *Computers & Mathematics with Applications* 65 (2013), no.10, 1596–1613 [arXiv:1207.5878](https://arxiv.org/abs/1207.5878)
- *Random Billiards with Wall Temperature and Associated Markov Chains*, with Renato Feres, *Nonlinearity* 25 (2012), no.9, 2503-2541, [arXiv:1202.2387](https://arxiv.org/abs/1202.2387)

- *An FPGA module for High Speed Data Collection in Nuclear Chemistry Experiments* - REU report, summer 2001
- *Toward a Photochromatic Derivative of Cymatrene* - REU report, summer 2000
- *Pressure Amorphization Studies in Zirconium Tungstate* - REU report, summer 1999

Presentations

- *From Billiard Dynamics to Thermodynamics*
 - SIAM Annual Meeting, Minisymposium, Engineering Applications of Mathematics, July 10, 2014
 - Colby College, April 19, 2013
 - Dominican University, February 15, 2013
 - Stephen F. Austin University, February 13, 2013
 - Hillsdale College, January 21, 2013
 - North Central College, January 17, 2013
 - Joint Mathematics Meeting, Special Session on Theory and Interdisciplinary Applications of Dynamical Systems, January 9, 2013
- *Mathematics of the Bad Bounce*, Haverford-Bryn Mawr Bi-College Mathematics Colloquium, October 31, 2011
- *Markov Chains from Billiards*, Graduate Colloquium WUSTL, June 15, 2011
- *Markov Chains Derived From Lagrangian Mechanics*, WUSTL, April 28, 2011
- *Billiard Markov Models*, Swarthmore College, March 17, 2011
- *Markov Mechanics*, Utica College, February 22, 2011

Combinatorics Seminar - Washington University in St. Louis

- *Billiard Models from Markov Chains*, November 3, 2010
- *Hyperplane Arrangements and Card Shuffling*, December 8, 2009
- *Trailing the Dovetail Shuffle to its Lair, part 2*, December 1, 2009
- *Trailing the Dovetail Shuffle to its Lair, part 1*, November 17, 2009
- *Introduction to Card Shuffling, part 2*, April 17, 2009
- *Introduction to Card Shuffling, part 1*, April 9, 2009
- *A Greedy but Good Graph Coloring Algorithm*, February 12, 2009
- *Homology of a Random Clique Complex*, November 30, 2008
- *Building Triangle Free Graphs*, May 1, 2008
- *Introduction to the Probabilistic Method*, February 28, 2008

Graduate Geometry of Physics Reading Group - Washington University in St. Louis

- *Holonomic Constraints*, October 23, 2007
- *Tensors*, September 18, 2007

Graduate Mathematical Physics Reading Group - Washington University in St. Louis

- *Introduction to Quantum Mechanics*, July 11, 2007
- *Maxwell's Equations*, June 13, 2007
- *The Inertia Tensor*, May 23, 2007

Presentations to Undergraduate and High School Students

- *It All Depends Upon Where You Start - Finding A Winning Strategy For The Game of Chomp*, MathILy summer math camp, July 15, 2013
- *How Tom Hanks Destroyed an Island or It's Just Common Knowledge*, Math Circles at WUSTL, February 13, 2011

- *Trailing the Dovetail Shuffle to its Lair*, WUSTL Undergraduate Math Club, October 27, 2009
- *The Monty Hall Problem*, Math Circles at the Youth Technology and Education Center, November 5, 2009
- *The Monty Hall Problem*, Math Circles at WUSTL, October 19, 2008
- *The Game of Nim*, Math Circles at WUSTL, February 10, 2008
- *Cryptography*, Math Circles at WUSTL, November 11, 2007
- *The Bridges of Königsberg*, Math Circles at WUSTL, October 26, 2006
 - Math Circles is a mathematics enrichment program for middle and high school students

Conferences

- Stochastic methods for non-equilibrium dynamical systems workshop, American Institute of Mathematics, Palo Alto, CA, June 2015 (scheduled)
- SIAM Annual Meeting, Chicago, IL, July 2014
- Dynamical Systems Summer School, Houston, TX May 2014
- AMS Central Sectional Meeting, St. Louis, MO, October 2013
- MAA MathFest, Hartford, CT, August 2013
 - Teaching with Classroom Voting and Clickers minicourse
- Blended Learning in the Liberal Arts, Bryn Mawr College, Bryn Mawr, PA, May 2013
- Joint Mathematics Meetings, San Diego, CA, January 2013
- Midwest Probability Conference, Evanston, IL October 2011
- Joint Mathematics Meetings, New Orleans, LA, January 2011
- AMS Spring Southeastern Sectional Meeting, Lexington, Ky, March 2010
- Combinatorics 2010: Advances, Trends, Speculation, Lexington, Ky, March 2010
- Wash U Frontiers In Technology and Science Conference, St. Louis, MO, April 2009
- Graduate Student Combinatorics Conference, Lexington, Ky, March 2009
- Joint Mathematics Meetings, Washington, D.C., January 2009
- AMS Spring Central Sectional Meeting, Bloomington, IN, April 2008

Academic Honors and Associations

Washington University in St. Louis, St. Louis, Missouri

- Dissertation Fellowship, Fall 2010 - Spring 2011
- Research Assistantship, Fall 2009
- Research Fellowship, Spring 2008
- University Fellowship, Fall 2004 - Spring 2005

Southern Nazarene University, Bethany, OK

- SNU Merit Scholarship, 1998-2002, full tuition, room and board
- Society of Physics Students, Member 1999-2002, President 2001-02, Vice-president 2000-01
- Mortar Board Honor Society, inducted 2000, Alumni officer 2001-02
- Sigma Pi Sigma - Physics Honor Society, inducted 2000
- Psi Chi - Psychology Honor Society, inducted 2000

Science Bowl, 1997-98

- Captain of state championship team, 1998
- Representative to national competition, 1998
- Captain of state runner up team, 1997