

Curriculum Vitae of Colin L. Starr

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• Education

- ◇ Ph.D., Mathematics, University of Kentucky, August, 1998. Graduate GPA: 4.00.
- ◇ M.S., Mathematics, University of Kentucky, May, 1995.
- ◇ B.S., Mathematics and Physics (double major), Music minor, Linfield College, May, 1993 (Summa Cum Laude). Undergraduate GPA: 3.96.

• Professional History

- ◇ Chair, Department of Mathematics, Willamette University, Spring 2010 - Spring 2012, Spring 2014.
- ◇ Professor, Department of Mathematics, Willamette University, 2014 - present.
- ◇ Associate Professor, Department of Mathematics, Willamette University, 2008 - 2014.
- ◇ Assistant Professor, Department of Mathematics, Willamette University, 2003 - 2008.
- ◇ Assistant Professor, Department of Mathematics and Statistics, Stephen F. Austin State University, 1998 - 2003.

• Publications (Note: all papers are peer-reviewed. * indicates an undergraduate (at the time of research) coauthor.)

- ◇ *How Students Think When Doing Algebra*, Rhine, S., Harrington, R., and Starr, C. (2018). Charlotte, NC: Information Age Publishing. Proofs returned August 2018.
- ◇ “Unipancyclic Matroids.” With Dr. Erin McNicholas, Will Agnew-Svoboda*, Alana Huszar*, Jeff Schreiner-McGraw*, and Corrine Yap*. Accepted pending revision at *Discrete Mathematics*. Revisions submitted August, 2018.
- ◇ “Prime Power and Prime Product Distance Graphs.” With Y. Kaneda, J. Laison, J. Schreiner-McGraw. Final revisions accepted at *Discrete Applied Mathematics* August, 2018.
- ◇ “Matroids.” With Drs. Erin McNicholas and Nancy Neudauer, appearing in *A Primer for Undergraduate Research* A. Wootton, V. Peterson, C. Lee, eds., Springer, 2018.
- ◇ “Accelerating Early Career Teachers’ Knowledge of Students and Content in Algebra.” 2013. In Lindmeier, A.M. and Heinze, A. (Eds.), *Proceedings of the Annual Meeting of the International Group for the Psychology of Mathematics Education*, Vol. 5, p. 152. Kiel, Germany: PME. With Dr. Steve Rhine (lead author) and Dr. Mike Charles. [1-page abstract]
- ◇ “The Algebraic Thinking Project: Functions.” 2013. In Lindmeier, A.M. and Heinze, A. (Eds.), *Proceedings of the Annual Meeting of the International Group for the Psychology of Mathematics Education*, Vol. 5, p. 171. Kiel, Germany: PME. [1-page abstract]
- ◇ “Finite Prime-Distance Graphs and 2-Odd Graphs,” *Discrete Mathematics* 313 (2013), pp. 2281-2291, with Dr. Josh Laison and Andrea Walker*.
- ◇ “Computing inertia sets using atoms,” *Linear Algebra and its Applications* 436 (2012) 4489-4502, with Wayne Barrett, Steve Butler, H. Tracy Hall, John Sinkovic, Wasin So, and Amy Yielding.
- ◇ “Polynomial Representation for the Expected Length of Minimal Spanning Trees,” *IIME Journal*, Vol. 13, No. 6, pp 357-365, 2012, with Dr. Peter Otto and Jared Nishikawa*.
- ◇ “Counting Lattice Chains and Delannoy Paths in Higher Dimensions,” *Discrete Mathematics* 311 (2011) 1803-1812, with Drs. John Caughman, Charles Dunn, and Nancy Neudauer.
- ◇ “Characterizing Frobenius Semigroups by Filtration,” *Journal of Integer Sequences*, Vol. 12 (2009), Article 09.1.2. with Dr. Inga Johnson and Sean Powers*, Charles Trevelyan*, and Craig Webster*.

- ◇ “Estimates of the Pythagoras Number of $\mathbb{R}_m[x_1, \dots, x_n]$ through Lattice Points and Polytopes,” with Dr. David B. Leep, *Discrete Mathematics* 308 (2008), pp. 5771-5781.
 - ◇ “A Generalization of a Theorem of Brauer and Birch,” *Communications in Algebra*, Vol 37, Issue 8, August 2009, with Dr. David B. Leep.
 - ◇ “Complementary Graphs and the Chromatic Number.” *Missouri Journal of Mathematical Sciences*, 20 (2008), no. 1, 19-26, with Dr. Galen E. Turner III.
 - ◇ “Planar Groups,” with Dr. Galen E. Turner. *Journal of Algebraic Combinatorics*, 19, pp. 283-295, 2004.
 - ◇ Supporting and Strengthening Standards-Based Mathematics Teacher Preparation, co-author. UT Dana Center, 2004.
 - ◇ Intermediate Algebra, with Dr. Jill Dumesnil. Published by Scholarship Press, Inc., 2004. (Now out of print.)
 - ◇ College Algebra: A Dream of Fields, with Dr. Jill Dumesnil. Published by Fountainhead Press, 2003. (Now out of print.)
 - ◇ “Polynomials in $\mathbb{R}[x, y]$ that are Sums of Squares in $\mathbb{R}(x, y)$,” *Proc Amer Math Soc*, 129 (2001), no. 11, 3133-3141, with Dr. David B. Leep.
- **Grants**
 - ◇ Summer 2016. Grant from President’s Discretionary Fund to create tutor-training materials for mathematics tutors. \$1800.
 - ◇ Summer 2012-Summer 2014. Co-PI on NSF grant for an REU-RET consortium. \$513,069.
 - ◇ Fall 2010-summer 2013. Team leader under FIPSE grant (PI Steve Rhine, Willamette School of Education.)
 - ◇ Summer 2010. Atkinson grant for travel to CBMS conference. \$600.
 - ◇ Summers 2007-2009. Co-PI on NSF grant for an REU-RET consortium. \$491,400.
 - ◇ Spring 2006. Received Hewlett grant for undergraduate summer research, \$9,000 for two years.
 - ◇ Fall 2001 - 2003. Writer and member of advisory board for FIPSE grant under principal investigator Uri Treisman and Project Director Deborah Pace.
 - ◇ Summer 2002. NSF Grant to participate in a week-long MAA PREP workshop on Knot Theory.
 - ◇ Summer 2001. Faculty Development grant for research from Stephen F. Austin State University. \$9,990, including support for one graduate student.
 - ◇ Summer 2000. NSF travel grant for “Mathematical Challenges of the 21st century” (AMS). \$1,000.
 - **Recognition and Awards**
 - ◇ 2011 Jerry E. Hudson Award for Excellence in Teaching, Willamette University College of Liberal Arts.
 - ◇ 2005 - 2006 Faculty Achievement Award, Willamette University
 - ◇ 1999 Project NExT Fellow.
 - ◇ 1997 - 1998 University of Kentucky Presidential Fellowship (one of nine awarded).
 - ◇ 1996 - 1997 Royster Award, the UK Math Department’s graduate student teaching award.
 - ◇ 1993 - 1996 3-year Quality Achievement Fellowship from the University of Kentucky.
 - **University Teaching**
 - ◇ Fall 2003 - Present. Willamette University courses: Problem Solving, Contemporary Mathematics, Discrete Mathematics, Brief Calculus, Differential Equations, Discrete Mathematics, Calculus I, Calculus II, Accelerated Calculus II, Sequences and Series, Multivariable Calculus, Linear Algebra, Number Theory, Complex Analysis, Abstract Algebra I and II, Modern Geometry, Real Analysis I and II, College Colloquium, Mathematics Senior Seminar, Graph Theory.
 - ◇ Summer 1998 - Spring 2003. Stephen F. Austin State University courses: Intermediate Algebra, College Algebra, Problem-Solving for Elementary Teachers (three course sequence), Analytic Geometry, Math in Society (liberal arts math course), Calculus I and II (differential and integral calculus), Introduction to Modern Mathematics, undergraduate Linear Algebra, Abstract Algebra (undergraduate and graduate), College Geometry.

- ◇ Summer 1998 - present. Taught several independent study courses, including Number Theory, Graduate Linear Algebra, Cryptography, and an annual Putnam preparation course.
- ◇ 2002 - 2003. Advised Master's thesis on Knot Theory.
- ◇ 2001 - 2002. Advised Master's thesis on Matroid Theory.
- ◇ 1999 - 2000. Advised Master's thesis on Galois Theory.
- ◇ Summer 1994 - Summer 1997. Teaching Assistant, Department of Mathematics, University of Kentucky. Full responsibility for nine different courses.
- **Conferences, Workshops, and Presentations** (Note that the JMM and MathFest are the two major math conferences each year)
 - ◇ Invited addresses
 - Spring 2015. "Prime Product Distance Graphs and Prime Power Distance Graphs," Number Theory Seminar, Oregon State University .
 - Fall 2012. "Inertia: It's Not Just for Physics Anymore!" at the Linfield Math and Physics Colloquium.
 - Spring 2012. "Inertia: It's Not Just for Physics Anymore!" at the Northern California Undergraduate Mathematics Conference, CSU Stanislaus. (Regional conference)
 - Spring 2010. "AP Calculus from a Reader's Perspective" at McNary High School.
 - Fall 2006. "Mission: Impossible – Angle Trisection," at Pacific University.
 - November 2004. "Unipancyclic Matroids," at the Portland Area Lecture Series (Portland State University). (Regional lecture series)
 - November 2003. "Regular Solids," at the Linfield College physics seminar.
 - ◇ Presentations (Since 2000.)
 - January 2018. "Problems inspired by the Nordhaus-Gaddum Theorem," Joint Mathematics Meetings, San Diego, CA. (National)
 - January 2018. "Binary UPC Matroids," Joint Mathematics Meetings, San Diego, CA. (National)
 - Spring 2017. "UPC Matroids, or: I Thought This Would Be Easier," Jim Albaugh Colloquium Series, Willamette University. (Local)
 - Spring 2015. "Prime Product Distance Graphs and Prime Power Distance Graphs," Jim Albaugh Colloquium Series, Willamette University. (Local)
 - January 2015. "Prime Product Distance Graphs and Prime Power Distance Graphs," Joint Mathematics Meetings, Seattle, WA. (National)
 - July 2013. "The Algebraic Thinking Project: Functions." Annual Meeting of the International Group for the Psychology of Mathematics Education, Kiel, Germany. (International conference)
 - January 2012. "The Algebraic Thinking Project," JMM, Boston, MA. (National conference)
 - June 2011. "Distributed Exams," PNW MAA Section Meeting, Juneau, AK. (Regional conference)
 - June 2011. "Delannoy Numbers," PNW MAA Section Meeting, Juneau, AK. (Regional conference)
 - Fall 2010. "Inertia Sets of Graphs," Willamette University Math Colloquium.
 - August, 2009. "Prime Distance Graphs and 2-odd Graphs," MathFest, Portland, OR. (National conference)
 - January, 2009. "The WiVaM Consortium REU-RET," JMM, Washington, D.C. (National conference)
 - Spring 2007. "Mission: Impossible – Angle Trisection," Willamette University Math Colloquium.
 - Fall 2006. "What is mathematics research?" at Faculty Colloquium, with Dr. Inga Johnson.
 - Summer 2006. "Hilbert's 17th problem," at Willamette. For Willamette University and Lewis & Clark College summer research students.
 - Spring 2005. "Matroids for Undergraduates" and "The Graph of a Group," both presented at Pacific Northwest MAA Section meeting, University of Puget Sound. (Regional conference)
 - October 2004. "Coloring for Grown-ups" at Mini-University, Willamette.
 - Spring 2004. "Conflict Prevention with Crayons" at Willamette's Faculty Colloquium.

- January 2002. “Complementary Graphs and the Chromatic Number,” JMM in San Diego, CA. (National conference)
- January 2001. “Planar Groups,” Joint Meetings in New Orleans, LA. (National conference)
- March 2000. “College Algebra at the College Level,” Texas Section meeting of the MAA at UT Austin. (Regional conference)
- ◇ Invited panelist
 - April 2015. “Mixing it up: engaging students by changing the classroom flow.” PNW MAA section meeting, Tacoma, WA.
 - June 2014. Writing Recommendation Letters. PNW MAA section meeting, Missoula, MT.
 - October 2003. Presenter at October pre-service conference in Austin, TX.
- ◇ **Workshops**
 - June 2018. NW5C Supporting Faculty of Color workshop, Lewis and Clark College, Portland, Oregon.
 - August 2010. CIC-CLA assessment conference in Newark, New Jersey.
 - July 2010. CBMS research conference: “The mutually beneficial relationship of matrices and graphs.”
 - October 1999, 2002, 2003. October pre-service conference in Austin, TX.
 - June 2002. Summer PREP Knot Theory Workshop.
 - Summer 1998. Eisenhower grant workshop.
 - Fall 1997. Workshop on Intercultural Communication.
 - Fall 1997. Seminar on technology in the classroom.
 - Fall 1996. Semester-long college teaching seminar at the University of Kentucky.
 - August, 1994. Emerging Scholars Program (a collaborative learning seminar) in Austin, TX.
- **Professional Service**
 - ◇ Summer-Fall 2018. Organizing and hosting NUMS, an undergraduate mathematics research conference, with Dr. Josh Laison.
 - ◇ Spring 2018. Reviewed for Discrete Mathematics.
 - ◇ 2014 - present. Member, Board of Directors of ATP
 - ◇ 2012 - 2014. Reviewer for Math Reviews.
 - ◇ 2012 - 2013. Local Project NExT Coordinator for PNW MAA Section meeting hosted at Willamette University.
 - ◇ 2011 - 2014. National Councilor for Pi Mu Epsilon, Webmaster for Pi Mu Epsilon.
 - ◇ Spring 2007 - Spring 2015. Newsletter Editor for Pacific Northwest Section of the MAA (officer position).
 - ◇ Spring 2010. Served as a judge for the Northwest Undergraduate Mathematics Symposium (NUMS) in Corvallis, OR.
 - ◇ Fall 2009. Reviewed “The Use of Various Technologies to Develop the Corner Point Principle: Students Make a Real-Life Business Decision” for Loci.
 - ◇ November 2008. Reviewer for NSF REU proposals.
 - ◇ 2006 - 2007. Contributed Papers Chair for Pacific Northwest Section of the MAA (officer position).
 - ◇ Januaries 2003, 2004, 2006, 2007, 2009, 2010. Joint meetings. Judged undergraduate poster session.
 - ◇ August 2006. Sponsored Max Nosiglia (Willamette undergraduate) to the Rose-Hulman Undergraduate Mathematics Journal (online). Published April, 2007: “Euclid’s Partition Problem and Ceva’s Theorem.” <http://www.rose-hulman.edu/mathjournal/v8n1.php>
 - ◇ Spring 2006. Reviewed book project for AMS: “The Nature of Mathematics,” Kelly and Kelly.
 - ◇ Most summers 2004 - 2010. Graded AP Calculus exams.
 - ◇ Spring 2005. Initiated/organized student problem-solving session for the PNW MAA Section meeting.
 - ◇ Spring 2004. Special Awards judge for the Intel International Science and Engineering Fair.

- ◇ Fall 2003. Reviewed “Parametric Plots” for the Journal of Online Mathematics;
<http://www2.kenyon.edu/People/holdenerj/Calcprojects/ParametricPlotsProject/ParametricPlotsProject.htm>
- ◇ Spring 2001 - 2003. University Interscholastic League Co-contest Director (Mathematics).
- ◇ Fall 1999 - present. Project NExT 1999 listserv manager.

- **University Service**

- ◇ 2018-2020. Chair of The Faculty Council.
- ◇ Spring 2017. Faculty Representative to the Board of Trustees for the Technology and Facilities Committee.
- ◇ 2014-2016. Member of Faculty Council.
- ◇ 2013. Appointed to President’s Working Group on Sexual Assault and Harassment.
- ◇ 2012 - 2014. Chair, Academic Status Committee.
- ◇ January 2010 - May 2012, spring 2014. Chair, Mathematics department.
- ◇ 2010 - 2011. Academic Status Committee member.
- ◇ Fall 2010. Grievance committee member.
- ◇ Spring 2010. Admissions Committee member.
- ◇ Spring 2008. Review committee member.
- ◇ Summer 2007. Co-director of REU-RET consortium (with Dr. Inga Johnson).
- ◇ Fall 2007-Spring 2009. Academic Council member.
- ◇ 2004-2007. Faculty Colloquium Co-Coordinator.
- ◇ January 2004, 2006, 2007. Interviewed job candidates at the Joint meetings of the AMS and MAA.
- ◇ Fall 2006 - present. Advisor to Willamette University Racquetball Club.
- ◇ Fall 2003 - present. Served as advisor for Willamette students.
- ◇ Fall 2003 - present. Advisor to Willamette University Math Club. (Started club in 2003.)
- ◇ Fall 2003 - Fall 2006. Served on Montag Advisory Board.
- ◇ Summer 2005, 2006. Co-director of the Summer Mathematics Research Program at Willamette University. Co-directed three Willamette students in undergraduate research.
- ◇ Spring 2004, 2005. Student Scholarship Recognition Day panel moderator.
- ◇ Summer 2004. Served on Disappearing Task Force on the First-Year Experience.
- ◇ Summer 2004. Served on QA Assessment committee.

- **Department Service**

- ◇ January 2010 - May 2012, Spring 2014. Chair.
- ◇ Falls 2003 - present. Sponsored Putnam Exam teams for Willamette (including weekly practice sessions).
- ◇ Spring 2004, 2008. Helped math department host OIMT; responsible for Advanced II category.
- ◇ Fall 2002 - Spring 2003. Assistant Professor representative on Departmental Advisory Committee (SFASU).
- ◇ Fall 1998 - 2003. Sponsored SFASU Putnam Exam teams (including weekly practice sessions) and Mathematical Contest in Modeling teams.
- ◇ Spring 2000. Chair, College Algebra Committee (SFASU).

- **Research Interests and Current Research**

- ◇ Graph Theory.
 1. The inverse inertia problem for graphs.
 2. Prime distance graphs and prime power distance graphs.
- ◇ Matroid Theory.

1. UPC Matroids.
 2. Algebraic Matroids.
- ◇ Sums of squares in $\mathbb{R}[x_1, \dots, x_n]$ and $\mathbb{R}(x_1, \dots, x_n)$.
 - ◇ Education in mathematics.
- **Consulting Experience**
 - ◇ Summer 2015. Assessments Review (comparing the CCSS to state standardized tests) for the Fordham Institute.
 - ◇ 2015-present. Item writer for ETS.
 - ◇ Spring/Summer 2011. Consultant for NCEE (National Council on Education and the Economy).
 - ◇ 2009 to present. Consultant for EPIC (Educational Policy Improvement Center). Various projects mostly concerning mathematics standards, including the Common Core.
 - ◇ Fall 2005 to present. Expert reviewer of state standardized tests for Measured Progress.
 - ◇ 2004 to present. AP Calculus reader.
 - ◇ Fall 2001 to 2005. Expert reviewer of state standardized tests for Harcourt Educational Measurement.
 - ◇ 1999 - 2005. Item writer for standardized tests for several states for Harcourt.
 - **Professional Associations**
 - ◇ Mathematics Association of America (MAA)
 - ◇ Project NExT
 - ◇ Pi Mu Epsilon (PME)