Dr. Steven J. Rosenberg

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Education

The Ohio State University, Columbus, OH
Doctor of Philosophy in Mathematics, 1996

Dissertation: "On a Conjecture of Mazur in Deformation Theory, with Supplementary Results on p-adic L-functions," advised by Warren M. Sinnott.

Fields of study: algebraic number theory (cyclotomic field theory, p-adic analysis, Iwasawa theory), combinatorics, commutative algebra, algebraic geometry. Exposure to ordinary and modular representation theory of finite groups, distribution theory and transform analysis, differential geometry, logic.

California Institute of Technology, Pasadena, CA
Bachelor of Science in Mathematics, with honor, 1990

Fields of study: calculus, multivariable calculus, real analysis, complex analysis, measure theory, functional analysis, probability, linear algebra, abstract algebra (two years), combinatorics, topics in the theory of finite simple groups.

Publications

Peer Reviewed

Steven J. Rosenberg, "On a combinatorial identity of Djakov and Mityagin", Utilitas Mathematica 100 (2016), pp. 217-220.

A.J. Geyer, D.A. Bulutoglu and S.J. Rosenberg, "The LP relaxation orthogonal array polytope and its permutation symmetries", Journal of Combinatorial Mathematics and Combinatorial Computing, Volume 91, November 2014, pp. 165-176.

Hlavacek, A., Froncek, D., and Rosenberg, S. J., "Edge reconstruction and the swapping number of a graph", The Australasian Journal of Combinatorics 58:1-15 (2014).

Rosenberg, S. J., "On a Combinatorial Identity of Djakov and Mityagin", to appear in Utilitas Mathematica (accepted July 11, 2012).

Bezrukov, S., Froncek, D., Rosenberg, S.J., and Kovar, P., "On biclique coverings", Discrete Mathematics 308:319-323 (2008).

Malladi, S. and Rosenberg, S., "Extending constraint solving for cryptographic protocol analysis with non-standard attacker inference rules", Proceedings of the Conference on Com-

munication, Network and Information Security, International Association of Science and Technology for Development (IASTED), Phoenix, Arizona (November, 2005).

Rosenberg, S.J., "On the Iwasawa Invariants of the Gamma-Transform of a Rational Function", Journal of Number Theory 109 (2004), 89-95.

Rosenberg, S.J., "A Large Index Theorem for Orthogonal Arrays, with Bounds", Discrete Mathematics 137 (1995), 315-318.

Non-Peer Reviewed

Post-graduate Level

Rosenberg, S.J., Kovar, P., Froncek, D., and Wimmer, K., "Existence results for arbitrarily vertex decomposable trees", Preprint MD 006 (2004).

Undergraduate Research

Ross, Michael and Rosenberg, S., "Integrality and Irreducible Polynomials in a Certain Ring Extension", The McNair Scholars Journal of the University of Wisconsin – Superior, Volume 12, 2011.

Bruner, Ryan and Rosenberg, S., "An Approach to the Jacobian Conjecture in Two Variables", The McNair Scholars Journal of the University of Wisconsin – Superior, Volume 11, 2010.

Kunkel, B. and Rosenberg, S., "Modeling Deer-Vehicle Collisions", The McNair Scholars Journal of the University of Wisconsin – Superior, Volume 7, 2006.

Eichmueller, V. and Rosenberg, S., "From Special Relativity to Gyrogroups", The McNair Scholars Journal of the University of Wisconsin Superior, Volume 5, 2004.

Beck, D. and Rosenberg, S., "Estimating the Number of Lattice Points in a Convex Polytope", The McNair Scholars Journal of the University of Wisconsin – Superior, Volume 3, 2002.

Presentations

Conferences

"1-Swappable Unicyclic Graphs", presented at the 50th Midwestern Graph Theory Conference (MIGHTY L), University of Wisconsin - Superior, October 23, 2010.

"Extending constraint solving for cryptographic protocol analysis with non-standard attacker inference rules", presented at the Conference on Communication, Network and Information Security, organized by the International Association of Science and Technology for Development (IASTED), Wigwam Resort, Phoenix, Arizona, November 14, 2005.

"Algebraic Constructions of Orthogonal Double Covers of K_n", presented at the 40th Midwest Graph Theory Conference (MIGHTY XL), Saginaw Valley State University, April 16, 2005.

Seminars and colloquia

"On a Combinatorial Identity of J. Borwein", Graduate Colloquium, December 8, 2011, University of Minnesota - Duluth Department of Mathematics and Statistics.

"The Borwein Conjecture", GRATKO seminar, December 1, 2011, University of Wisconsin - Superior.

"The Rasch Model: Measuring Ability and Difficulty", Undergraduate Mathematics Colloquium, February 17, 2011, University of Minnesota - Duluth.

"Galois Theory Via Arithmetic", Mathematics Seminar, March 18, 2010, Saginaw Valley State University.

"Jacobians of Polynomial Mappings", Graduate Colloquium, October 15, 2009, University of Minnesota - Duluth Department of Mathematics and Statistics.

"Provably Hard and Provably Impossible Tasks", Undergraduate Mathematics Colloquium, September 25, 2008, University of Minnesota Duluth. "Relative Difference Sets in Cyclotomic Galois Rings", GRATKO seminar, November 7, 2007, University of Wisconsin – Superior.

"Swapping Number of a Graph II: Probabilistic Estimates", GRATKO seminar, September 19, 2006, University of Wisconsin – Superior.

"The Swapping Number of a Graph", GRATKO seminar, October 4, 2005, University of Wisconsin – Superior.

"Some Algebraic Constructions of Orthogonal Double Covers (ODCs)", GRATKO seminar, April 7, 2005, University of Minnesota Duluth.

"Latin Squares, Orthogonal Arrays, and Convex Polytopes", Undergraduate Mathematics Colloquium, February 3, 2005, University of Minnesota Duluth.

"Galois Theory Via Arithmetic", Undergraduate Mathematics Colloquium, September 23, 2004, University of Minnesota Duluth.

"On the Spanning Tree Congestion of a Graph", GRATKO seminar, April 7, 2004, University of Wisconsin – Superior.

"On the Maximal Vertex Degree in an Arbitrarily Decomposable Tree (ADT)", GRATKO seminar, January 28, 2004, University of Minnesota Duluth.

"On lambda-invariants of Totally Real Number Fields, II", GRATKO seminar, March 5, 2003, University of Minnesota Duluth.

"On lambda-invariants of Totally Real Number Fields", GRATKO seminar, February 26, 2003, University of Wisconsin – Superior.

Employment

University of Wisconsin – Superior

Professor,	2014 –	present
Associate Professor,	2007 –	2014
Assistant Professor,	2002 –	2007
Visiting Assistant Professor,	2001 –	2002

- Taught undergraduate courses in mathematics and computer science, both in the gen-

eral education program and in the major curriculum, including:

  - introduction to contemporary mathematics (MATH 112)
  - intermediate algebra (MATH 102)
  - elementary statistics, algebra-based (MATH 130)
  - calculus I, II, and III (MATH 240, 241, and 242)
  - introduction to abstract mathematics (MATH 310)
  - introduction to abstract algebra (MATH 455)
  - abstract algebra II (as MATH 481)
  - general topology (as MATH 481)
  - probability theory with applications, calculus-based (MATH 370)
  - statistics, calculus-based (MATH 371)
  - introduction to computer science (CSCI 101), for non-majors
  - introduction to computer programming using Java (CSCI 201)
  - object-oriented programming using Java and C++ (CSCI 202)
  - algorithms and data structures using C++ and C# (CSCI 303)
  - computer graphics (CSCI 331)
  - database systems (CSCI 356)
  - software development and professional practice (CSCI 340)
  - theory of computation (MATH/CSCI 421)
  - group capstone project in computer science (CSCI 499)
  - Putnam Competition (MATH 391)

- Acted as faculty adviser for about 20 students each semester
- Senior personnel on NSF Collaborative Research grant in cybersecurity (2003-2005)
- Leadership roles include:

  - Chair of the Academic Program Review Council (2014-present)
  - Team Leader for Criterion 4 (Teaching and Learning: Evaluation and Improvement), Higher Learning Commission accreditation committee (2015-2016)
  - Chair of the faculty (elected by faculty at large; 2010-11 and 2011-12)
  - Chair of the Undergraduate Academic Affairs Council (2007-08)
  - Chair of the General Education Committee (2006-07)
  - Chair of departmental Search and Screen Committee for assistant professor of mathematics (2012-13)

- Served on university committees and councils:

  - Undergraduate Academic Affairs Council (2003-2008; chair, 2007-08)
  - General Education Subcommittee (2004-2007; chair, 2006-07)
  - Academic Program Review Council (2012-)

  - Assessment Academy Team of the Higher Learning Commission (2012-2014)
  - Search and screen committee for the position of Institutional Planner (Associate), Fall 2012. This search was successfully concluded in December 2012
  - Search and screen committee for the position of Director of the Office of Institutional Effectiveness, Summer 2013
  - Equity Scorecard Team (Summer 2009 - Spring 2010)
- Active in curriculum design and creation of new courses: designed and implemented Software Engineering (CSCI 340); Group Capstone (CSCI 499); Database Systems (CSCI 356); Cryptography (MATH 437)
- Co-organized mathematics conferences, including MIGHTY L (2010)
- Conducted undergraduate research: advised senior projects in mathematics and computer science, as well as five McNair Scholar research projects in mathematics
- Advised the Mathematics and Computer Science Club of UW-Superior
  - Helped organize presentations by internal and external speakers
  - Organized and led trips to regional mathematics conferences
  - Co-organized an annual programming competition for UW-Superior students; created many of the programming problems, solutions, and test cases
- Served as departmental liaison to the computer careers advisory group of a local two-year college
- Co-organized annual High School Math Meet (mathematics competition) with 8 regional high schools participating; contributed problem sets for each years Math Meet competition

Programmer/Analyst, Watson Wyatt & Company, 1999 – 2001

Designed, implemented, documented, and supported customized business solutions. Interfaced with clients on a regular basis to resolve issues and define their needs in the role of human resources technology consultant.

- Assumed lead role in pension calculation systems development for clients that include a regional utilities corporation and a state-legislated pension fund
- Developed flexible health benefits enrollment systems with interactive voice response and Web components
- Successfully completed over a dozen medium- to large-scale projects, including Year 2000 readiness testing for three major clients, implementation of a Web-based pension benefits modeler, and the conversion of historical pension data onto a new platform
- Leveraged analytical and mathematical skills to aid business analysts in defining complex systems requirements

Lecturer in Mathematics, The Ohio State University, 1997 – 1998

- Taught undergraduate courses in business algebra, pre-calculus, calculus for engineers, multivariable calculus, differential equations, discrete mathematics for computer science majors, and linear algebra
- Successfully conducted classes with sizes from 12 to 160 students
- Supervised up to five teaching assistants at a time
- Composed lectures and examinations, assisted in grading of examinations, assigned final course grades

Graduate Teaching/Research Assistant, The Ohio State University, 1990 1996

- Taught recitation sections of undergraduate courses in business algebra (with linear programming), pre-calculus, business calculus, engineering calculus, and differential equations; graded homework sets and quizzes
- Collaborated with course coordinators and lecturers to review, administer, and score course examinations and assist in determining final course grades
- Graded homework for honors calculus and graduate-level real analysis courses
- Worked as a private mathematics tutor under a state-funded program
- Received multiple fellowships, including a U.S. Department of Education Fellowship

Summer Undergraduate Research Fellow in Mathematics, California Institute of Technology, 1989

Investigated and contributed to the solution of problems in graph theory; presented results in oral and written formats; advised by Professor Richard M. Wilson

Summer Undergraduate Research Fellow in Radio Astronomy, California Institute of Technology, 1988

Studied "superluminal" radio sources: operated a 40-meter radio telescope on-site in the Mojave Desert, analyzed data using software tools, and presented results in oral and written formats

Technology Skills and Experience

- Developed three-tier business applications in the Microsoft Visual Studio environment under Windows using Visual C/C++ and Visual Basic; experience with Java development
- Proficient in Microsoft SQL, including SQL-integrated software design and construction of relational database models
- Experience with Active Server Pages Web technology under Microsoft IIS using VBScript and HTML
- Familiar with Windows, UNIX, Linux, and Macintosh operating systems

Honors and Awards

- McNair Mentor of the Year Award, 2006 (Duluth-Superior area)
- National Merit Scholarship winner
- First Place in Physics for the State of Ohio, Junior Engineering and Technical Society
- Science Award winner, American Society for Metals (Cleveland Chapter)