



7. Embeddings of Complete Multipartite Graphs in Finite Projective Planes

Ryan Vaughn, University of Mary Washington

Advisor: Oscar Vega, California State University, Fresno (California State University, Fresno REU)

11. Cycles and Cycle-related Graphs in $PG(2, q)$

Jamie Peabody, California State University, Fresno

Jordan White, California State University, Monterey Bay

Advisor: Oscar Vega, California State University, Fresno (California State University, Fresno REU)

14. The Effect of Mixed Conducting and Insulating Wall Segments on the Ideal MHD Duct Problem.

Jason Cornelius, Delaware State University

Advisor: Pablo Suárez, Delaware State University (Delaware State University REU)

28. A Multivariate Statistical Inference for the Analysis of Neuronal Spiking Rates

Reina Galvez, California State University, Fullerton

Antouneo Kassab, California State University, Fullerton

Duy Ngo, California State University, Fullerton

Advisor: Sam Behseta, California State University, Fullerton

30. Rook Placements on Young Diagrams: Towards a q -Analogue of the Harer-Zagier Formula

Max Wimberley, Massachusetts Institute of Technology

Advisor: Alejandro Morales, LaCIM, Université du Québec à Montréal (MIT REU)

31. Predicting the Presence of Multiple Sclerosis Using Semantic Categories and Logistic Regression

Brayan Ortiz, California State University, Fullerton

Advisor: Mortaza Jamshidian, California State University, Fullerton

48. Measuring the Decline in Crime and Setting Reasonable Crime Reduction Targets

Austin Alleman, Santa Clara University

Arturo Fernandez, University of California, Berkeley

Advisor: Martin Short, Institute for Pure and Applied Mathematics (University of California, Los Angeles REU)

50. Mitochondrial Iron: a Mathematical Model for Iron Regulatory Disease

Jessica Lunsford, East Tennessee State University

Advisor: Erika Camacho, Arizona State University (Arizona State University MTBI REU)

59. Atomistic and Coatomistic of the Supercharacter Theory Lattices of Cyclic Groups

Daniel Stoertz, Concordia College

Dylan Heuer, Concordia College

Advisor: Anders O.F. Hendrickson, St. Norbert College (Concordia College REU)

62. Design of laser beams in GRIN media for profile transformation and selective resonance

Tim Moon, Rice University

Delani Cele, Ithaca College

Hyunmoon Kim, Princeton University

Philip Burnham, Villanova University

Advisor: Daniel Flath, Macalester College (Macalester College-IMA REU)

64. Pursuit-Evasion in Polygonal Environments: When Can Two Cops Win?

Rosalie Carlson, Harvey Mudd College

Maxray Savage, Macalester College

Claire Djang, Oberlin College

Stephen Ragain, Pomona College

Advisor: Andrew Beveridge, Macalester College (Macalester College-IMA REU)

69. Modeling the Human Papillomavirus (HPV) with Female and Male Protected Classes

Arielle Gaudiello, The Richard Stockton College of New Jersey

Advisor: Brandy Rapatski, The Richard Stockton College of New Jersey

71. Recycling toward a Better Earth through Math

Yvette Niyomugaba, Southwestern University

Advisor: Therese Shelton, Southwestern University

83. Modeling antibiotic resistance in intensive care units

Andre Waschka, North Carolina State University

Advisor: Ralph Smith, North Carolina State University (University of Wyoming REU)

84. Prisoner Reform Programs, and their Impact on Recidivism

Kimberly Gutstein, Humboldt State University

Brenda Martinez, Bryn Mawr College

Itehomme Fene, University of Louisiana, Lafayette

Advisor: Luis Melara, Shippensburg University (Arizona State University MTBI REU)

85. How Ideas Grow: Critical Mass in the Linear Threshold Model

Hossein Alidaee, Macalester College

Advisor: Andrew Beveridge, Macalester College

95. Generic Polynomials for Transitive Subgroups of Order 8 and 9

Jonathan Jonker, Michigan State University

Advisor: Jorge Morales, Louisiana State University (Louisiana State University REU)

96. The Two-Dimensional Smoothing of Images via the Total Variational Model

Jo Fawna Reali, California State University, Stanislaus

Paulos Alemu, California State University, Stanislaus

Joshua Galvez, California State University, Stanislaus

Susana Urquizo, California State University, Stanislaus

Advisor: Jung-ha An, California State University, Stanislaus (California State University, Stanislaus REU)

99. A Statistical Model to Detect Copy Number Variation

Elizabeth Cangialosi, University of Delaware

Aashish Gadani, University of Maryland, College Park

Advisor: Yeung Hau Man, Hong Kong University of Science and Technology (RIPS - Hong Kong REU)

110. Using ideal-divisor graphs to classify ideals of finite commutative rings with identity

Lane Bloome, Millikin University

Hailee Peck, Millikin University

Advisor: Joe Stickles, Millikin University

114. Numerical Integration of Rational Bubble Functions with Multiple Singularities

Michael Schneier, University of Pittsburgh

Advisor: Michael Neilan, University of Pittsburgh

127. Accepted Elasticity in Arithmetic Congruence Monoids

Marla Williams, Willamette University

Lorin Crawford, Clark Atlanta University

Jason Steinberg, Princeton University

Advisor: Vadim Ponomarenko, San Diego State University (San Diego State University REU)

128. Growth Functions of Finitely Generated Algebras

Kelsey Wells, Brigham Young University, Idaho

Advisor: Harold W. Ellingsen Jr., The State University of New York at Potsdam (The State University of New York at Potsdam REU)

134. Classifying Extensions of Characteristic p Local Fields

Daniel Scofield, Grove City College

Lindsey Hiltner, University of North Dakota

Advisor: Jim Brown, Clemson University (Clemson University REU)

145. The Varieties of One-Sided Loops of Bol-Moufang Type

Rachel Aldrich, Otterbein University

Sarah Drummond, Eastern Illinois University

Advisor: Reza Akhtar, Miami University (Miami University, Oxford, Ohio REU)

147. Hyperbananas: A Family of Flexible Frameworks

Christopher Clement, University of Michigan

Advisor: Jessica Sidman, Mount Holyoke College (Mount Holyoke College REU)

150. Modeling Mutidimensional Tolerance Stack-up Using Monte Carlo Methods

Gregory Zajac, University of Missouri

Garrett Castle, Idaho State University

Salil Gadgil, Swarthmore College

Advisor: Matthew Willyard, Pennsylvania State University (Worcester Polytechnic Institute REU)

154. Trirings and Trifields

Brandon Alberts, Michigan State University

Advisor: Rajesh Kulkarni, Michigan State University

155. Stability of traveling-wave solutions to the Whitham equation

Nathan Sanford, Seattle University

Advisor: John Carter, Seattle University

159. Abelian Varieties with Real Multiplication and Maximal Image of Galois

Zane Li, Princeton University

Tony Feng, Harvard University

Advisor: Ken Ono, Emory University (Emory University REU)

160. Graph Theoretical Comparison of *Coprinus cinerea* Wild Type and Mutant Networks

Samantha Taylor, Washington & Jefferson College
Catherine Monahan, Washington & Jefferson College
Advisor: Faun Doherty, Washington & Jefferson College

211. Comparison of Two Models for Fat/Water Separation in Magnetic Resonance Imaging (MRI)

Cody Gruebele, California State University, Fullerton
Advisor: Angel R. Pineda, California State University, Fullerton

216. Bounds on the Size of Sound Monotone Switching Networks Accepting Permutation Sets of Directed Trees

Joshua Brakensiek, Homeschool High School
Advisor: Aaron Potechin, MIT (MIT, Research Science Institute REU)

222. The Perfect Parallelepiped Problem

Amy VanHooft, The College at Brockport
Benjamin Sokolowsky, Bucknell University
Rachel Volkert, University of Northern Iowa
Advisor: Cliff Reiter, Lafayette College (Lafayette College REU)

234. Hopf-Cole Type Transformations for a Viscous Burgers Equation

Thomas Deatherage, University of Central Arkansas
Brandon Ashley, University of Central Arkansas
Advisor: Danny Arrigo, University of Central Arkansas

236. Strings of Special Primes in Arithmetic Progressions

Sarah Peluse, The University of Chicago
Keenan Monks, Harvard University
Lynnelle Ye, Stanford University
Advisor: Ken Ono, Emory University (Emory University REU)

238. Improved High-Order Modulation Maximal Likelihood Detection in MIMO System

Skyler Seto, Massachusetts Institute of Technology
Karen Larson, University of California at Los Angeles RIPS
Advisor: Albert Ku, Hong Kong University of Science and Technology (Hong Kong University of Science and Technology REU)

264. Combinatorial Models for Diagram Algebras

Mike Reeks, Macalester College
Advisor: Thomas Halverson, Macalester College

266. Discrete Morse Theory and Homology

Brian Green, Ursinus College
Alex Onderdonk, Immaculata University
Michael Agiorgousis, Ursinus College
Advisor: Nicholas Scoville, Ursinus College (Ursinus College REU)

272. Digraph Sources and Digraphs of Reduced Rings

Alex Schulte, University of St. Thomas
Advisor: Michael Axtell, University of St. Thomas (Center of Applied Mathematics, UST REU)

276. Fast Approximation Algorithms for Spectral Clustering

Juan Carlos Ramirez, Instituto Tecnológico Autónomo de México

Advisor: Deanna Needell, Institute for Pure and Applied Mathematics (RIPS-Los Angeles REU)

278. Using Pebble Game Algorithms to Find Non-Generic Embeddings of a Framework

James Farre, The University of Texas at Austin

Advisor: Jessica Sidman, Mount Holyoke College (Mount Holyoke College REU)

283. A New Probability-Based Characteristic in Finite Group Theory

Danny Orton, California State University, Fullerton

Daniel Lenders, California State University, Fullerton

Advisor: Scott Annin, California State University Fullerton

289. Effects of Momentum Trading on Asset Prices

Neeraj Vijay, George Mason University

Advisor: Harbir Lamba, George Mason University

291. Ranking Rankings: a Comparison of the Predictive Power of Sports Ranking Methods

Peter Elliott, University of California at Los Angeles

Daniel Barrow, Pitzer College

Ian Drayer, University of California at Los Angeles

Garren Gaut, University of California at Los Angeles

Advisor: Braxton Osting, UCLA (UCLA REU)

292. A Lower Bound on The Fineness of the Smooth Concordance Group

Joshua Tobin, Columbia University

Advisor: Jen Hom, Columbia University (Columbia University REU)

302. Elliptic Curves with Full 2-Torsion and Maximal Adelic Galois Representations

Sarah Trebat-Leder, Princeton University

David Corwin, Princeton University

Advisor: David Zureick-Brown, Emory University (Emory University REU)

313. A Paradoxical Decomposition of the Real Number Line

Shelley Kandola, St. Lawrence University

Advisor: Sam Vandervelde, St. Lawrence University

317. Co-Circular Central Configurations of Four Vortices

Alexander Gutierrez, Arizona State University

Jonathon Gomez, Brigham Young University, Hawaii

Jesse Robert, University of Hawaii at Hilo

Advisor: John Little, College of the Holy Cross (University of Hawaii at Hilo REU)

321. On the c -strong Chromatic Number of t -intersecting Hypergraphs

Ping Ngai Chung, Massachusetts Institute of Technology

Advisor: Joseph Gallian, University of Minnesota Duluth (University of Minnesota Duluth REU)