Outstanding Posters for the MAA Student Poster Session at the JMM 2017

Outstanding Posters make up the top 15% of each topical category.

**Algebra**

7. **The Sandpile Group of Thick Cycle Graphs**
   - Micah Chioke Henson, Spelman College
   - Jonathan Celaya, Rice University
   - Diane Christine Alar, San Francisco State University

*Advisor: Dr Luis Garcia Puente, Sam Houston University*

9. **Factorization Properties of Int(\mathbb{Z})**
   - Greg Knapp, Case Western Reserve University
   - Jad Salem, Oberlin College
   - Gabrielle Scullard, University of Rochester

*Advisor: Dr Paul Baginski, Fairfield University*

10. **Associated Primes of the Cover Ideals of Graphs**
    - Sabrina Melinda Lato, Carthage College
    - Molly Mayne Hoch, Wellesley College
    - Corey Tucker Brooke, St. Olaf College
    - Bryan M Wang, University of California, Berkeley

*Advisor: Dr. Janet Striuli, Fairfield University*

12. **Toric Mutations in the dP$^2$ Quiver and Subgraphs of the dP$^2$ Brane Tiling**
    - Zhaoqi Li, Macalester College
    - Thuy-Duong Vuong, Massachusetts Institute of Technology

*Advisor: Associate Professor at University of Minnesota Gregg Musiker, University of Minnesota*

37. **Non $\mathcal{L}_2$ Low Regularity Solutions to the gMHD Equation**
    - Anh Thuong Vo, Creighton University

*Advisor: Dr. Nathan Pennington, Creighton University*
Applied Mathematics

43. **Introducing Fractional Dynamics to Quantum Random Walks**
   - Lucas Christopher Bouck, George Mason University
   
   *Advisor: Dr. Harbir Antil, George Mason University*

47. **New Algorithms for Decoding Insertions in Helberg Error-Correcting Codes**
   - Dane Charlton, Rowan University
   
   *Advisor: Dr. Hieu Nguyen, Rowan University*

49. **Stability of Agent-based Models**
   - Cassandra Cole, Brown University
   - Philip Doldo, Rensselaer Polytechnic Institute
   - Qing Fan, Pomona College
   
   *Advisor: Professor Bjorn Sandstede, Brown University*

53. **Space Filling Curves**
   - Shaquille Dixon, Coastal Carolina University
   
   *Advisor: Dr. Andrew Incognito, Coastal Carolina University*

56. **Cluster With Caution**
   - Craig Joseph George, University of Houston
   
   *Advisor: Professor Bernhard Bodmann, University of Houston*

61. **Police Patrol Zone Realignment in Huntington, WV**
   - David Benjamin Jones, Marshall University
   - Sara Elysabeth Brumbaugh, Marshall University
   
   *Advisor: Dr. Michael Schroeder, Marshall University*

72. **Mathematical Model to Noninvasively Detect Dry-Eye Diseases**
   - Trini Nguyen, California State University Fullerton
   
   *Advisor: Mathematics Professor Charles H. Lee, California State University, Fullerton*
95. First Integrals of Elliptic Monge-Ampere Equations
   • Andrea Nicole Weaver, University of Central Arkansas
   Advisor: Dr. Daniel Arrigo, University of Central Arkansas

99. A Dynamic Model Of Protein Hydrogel Mechanics
   • Kirill Y Shmilovich, University of Wisconsin - Milwaukee
   Advisor: Associate Professor Gabriella Pinter, Associate Professor of Mathematics

Biomathematics
110. Elucidating serine richness in Arabidopsis thaliana transcript using the Exact Distribution of the Number of Clumps
   • Dustin Jovan Ford, Philander Smith College
   Advisor: Dr Deidra Coleman, Philander Smith College

116. Modeling Dermal Diffusion and Metabolism for Consumer Products
   • Megan C Hollister, Baylor University
   Advisor: Dr. Marina Evans, North Carolina State University

119. A Mathematical Model for Copper Homeostasis in \textit{Pseudomonas aeruginosa}
   • Brianna Gail Kozemzak, Saint Mary's College
   Advisor: Dr. Pedro Mendes, Center for Quantitative Medicine, UConn Health

122. Optimal Net Energy and Foraging Behavior of the Grus americana
   • Kristen Marie Lawler, Marist College
   Advisor: Associate Professor John Allford, Sam Houston State University

123. Association of Low-Frequency Variants in Regulatory Regions with Non-Syndromic Orofacial Clefts
   • Jessica Lynn LeClair, Emmanuel College
   Advisor: Dr. John Shaffer, University of Pittsburgh
130. **Mathematically Modeling Cancer Metastasis Through Mechanical Properties Detected By A Microfluidic Microcirculation Mimetic**

- Sruti Prathivadhi, Creighton University

*Advisor: Dr. Andrew Ekpenyong, Creighton University*

143. **Nonlinear Elastic Dynamics of Vascular Ehlers-Danlos Syndrome**

- Timothy P Thorn, University of North Carolina at Asheville

*Advisor: Dr. Becky Sanft, University of North Carolina at Asheville*

149. **Modeling growth, nutrient uptake and nitrate reductase activity in phytoplankton from a freshwater urban pond and lake. Departments of Math and Biology.**

- Karl Gregory Schuchard, University of Wisconsin-Milwaukee

*Advisor: Dr. Gabriella Pinter, University of Wisconsin-Milwaukee*

### Computational Mathematics

156. **Developing Colorimetric Comparisons for Paper Analytical Devices**

- Catalina Maria Vajiac, Saint Mary's College

*Advisor: Dr. Ian Bentley, Saint Mary's College*

### Geometry

163. **Generating Space-Filling Trees**

- Nicholas H Nelsen, Oklahoma State University

*Advisor: Assistant Professor Henry Segerman, Oklahoma State University*

### Graph Theory

170. **Packing Colorings of Graph Products**

- Catherine Ann Cooper, Trinity College

*Advisor: Dr Kirsti Wash, Trinity College*

173. **An Exploration of Divisor Graphs and Fractional Matching Number**

- Justin Andrew Groves, Winthrop University

*Advisor: Dr. Arran Hamm, Winthrop University*
174. Concussion Detection using Graph Theory and Logistic Regression
   - Devika Jhunjhunwala, University of Richmond
   - Shuyi Chen, University of Richmond
   - Quinn McDonough, University of Richmond

   Advisor: Professor Kathy Hoke, University of Richmond

178. Domination in the Hierarchical Product and Vizing's Conjecture
   - Shriya Vedantham Nagpal, Trinity College

   Advisor: DR Kirsti Wash, Trinity College

180. Maximizing the number of homomorphisms into \( V_k \)
   - Andrew Robert Pallotto, Montclair State University
   - Kevin Craig Weatherwalks, Montclair State University

   Advisor: Dr. Jonathan Cutler, Montclair State University

186. Small Graphs with Generalized Quaternion Automorphism Group
   - Lillian Webster, Grinnell College
   - Kripa Khanal, University of Texas at Dallas
   - Samuel Edwards, Gettysburg College

   Advisor: Assistant Professor Stephen Graves, University of Texas at Tyler

Mathematical Education
191. Cluster Analysis: A Pedagogical Investigation
   - Kallie Anna Simpson, Slippery Rock University

   Advisor: Dr. Dil Singhabahu, Slippery Rock University

Number Theory
202. Ramification of Wild Automorphisms of Laurent Series Fields
   - Kenz Kallal, Boston University - PROMYS
   - Hudson Kirkpatrick, Boston University - PROMYS

   Advisor: Professor Laurent Berger, École Normale Supérieure de Lyon
206. Infinite Product Exponents for Modular Forms

- Nitya Mani, Stanford University
- Asra Ali, MIT

Advisor: Professor Ken Ono, Emory University

207. Anomalous Primes and the Elliptic Korselt Criterion

- Eric Neyman, Princeton University
- Jackson Bahr, Carnegie Mellon University
- Yujin Hong Kim, Columbia University
- Gregory Kyle Taylor, College of William & Mary

Advisor: Associate Professor Liljana Babinkostova, Boise State University

Numerical Analysis

217. A Spectral Subgradient Algorithm of Non-Smooth Optimization

- David Hamilton Kotval, University of Tennessee at Chattanooga
- Yiting Xu, University of Washington, Bothell

Advisor: Dr. Milagros Loreto, University of Washington, Bothell

Other

222. Completing Partial Latin Squares Arising from Latin Arrays

- Stacie Marie Baumann, West Virginia Wesleyan College
- Kevin Akers, Concord University
- Sarah Gustafson, Davis and Elkins College

Advisor: Dr. Michael Schroeder, Marshall University

227. Side-Channel Attacks and Countermeasure Characterization

- Lucius Bynum, Harvey Mudd College
- Laura Daines, King’s College London
- Sneha Kudugunta, Indian Institute of Technology, Hyderabad
- Tram Nghi Pham, University of California, Berkeley

Advisor: Dr. Alejandro Morales, UCLA

242. Bijecting Recurrent Configurations on an Eulerian Digraph and its Reverse

- Tafari Clarke James, Haverford College
- Casandra Monroe, Princeton University
244. **Chaos and Integrability in Mushroom Billiards**
- Emily Christine Joslin, Baylor University
- Samuel King, Boston University
- Michael Vavala, Fairfield University

**Advisor: Dr. Mark Demers, Fairfield University**

247. **Combinatorial Diameters and Automorphisms of Gelfand-Tsetlin Polytopes**
- Benjamin Krakoff, Yale University
- Yibo Gao, Massachusetts Institute of Technology
- Lisa Lee Yang, Massachusetts Institute of Technology

**Advisor: Professor Victor Reiner, University of Minnesota Twin Cities**

255. **Using Image Analysis and Machine Learning Techniques for Classification of Harmful Algal Blooms**
- Maria Elizabeth Ruwe, Northern Kentucky University
- Rachel Nicole Zieverink, Northern Kentucky University

**Advisor: Doctor Michael Waters, Northern Kentucky University**

258. **Quantifying CDS Sortability of Permutations Using Strategic Piles**
- Meghan Shanks, Texas A&M University
- Marisa Gaetz, Massachusetts Institute of Technology
- Bethany Molokach, Western Carolina University

**Advisor: Dr. Marion Scheepers, Boise State University**

267. **Comparing the extent to which closure methods recover the knot type of a closed knot from open subarcs**
- Emily Kathleen Vecchia, University of Saint Thomas

**Advisor: Dr. Eric Rawdon, University of Saint Thomas**

**Probability and Statistics**

271. **Modeling Metabolic Outcomes and Symptom Severity Based on Genetic Risk Factors in Patients with Schizophrenia: An Exploratory Use of Tree-Based Algorithms**
- Grace Ware Cavanaugh, College of the Holy Cross

**Advisor: Professor Shannon Stock, College of the Holy Cross**
279. Upper and lower bounds on the speed of an excited random walk
   - Owen Levin, University of Minnesota
   - Jacob Smith, Franklin College
   Advisor: Jonathon Peterson, Purdue University

285. Modeling Emergency Department Arrivals using Non-Homogeneous Poisson Processes
   - Rachel Elizabeth Wagner, Coastal Carolina University
   Advisor: Dr. Lindsey Bell, Coastal Carolina University

291. Statistical Analysis of Weather Forecasts: Accuracy of Internet Weather Forecasts vs. Statistical Models
   - Yayu Zhou, University of Illinois at Urbana-Champaign
   - Sijia Huo, University of Illinois at Urbana-Champaign
   - Yantong Zheng, University of Illinois at Urbana-Champaign
   - Yunxin Zhang, University of Illinois at Urbana-Champaign
   Advisor: Professor A J Hildebrand, University of Illinois

**Topology**

298. The Effect of Doubling Operators on Colorability of Knots and Links
   - Molly Mae Petersen, University of Wisconsin-Eau Claire
   Advisor: Associate Professor Carolyn Otto, University of Wisconsin-Eau Claire

299. Volume Preserving Surgeries on Hyperbolic 3-Manifolds
   - Peter Rudzis, University of Washington
   Advisor: Dr. Rolland Trapp, California State University - San Bernardino