

## 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 $\text{Int}(\mathbb{Z})$

- 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 $L_2$ 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 *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 Alford, 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 Jhunhunwala, 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  $S_n$**

- 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
- Sneha Kudugunta, Indian Institute of Technology, Hyderabad
- Tram Nghi Pham, University of California, Berkeley

*Advisor: Dr. Alejandro Morales, UCLA*

#### 242. **Bijection Recurrent Configurations on an Eulerian Digraph and its Reverse**

- Tafari Clarke James, Haverford College
- Casandra Monroe, Princeton University

*Advisor: Professor Luis Garcia-Puente, Sam Houston State 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

*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*