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MAA New Jersey Section

Fall 2016 Joint New Jersey/EPaDel Section Meeting

Hosted by Villanova University, November 12, 2016

8:30	**Light Breakfast** (Driscoll Lobby)		**Registration Opens** (Driscoll Lobby) **Silent Auction begins**
9:20	**Welcoming Remarks** (Driscoll Auditorium)		
9:30	**Invited Speaker: Betty Mayfield (Hood College)** (Driscoll Auditorium) *Gerbert d'Aurillac and the March of Spain: A Guy in the Right Place in the Right Time*.		
10:25	**Coffee Break/Silent Auction** (Driscoll Lobby)		
10:50	**Invited Speaker: Martha Siegel (Towson University)** (Driscoll Auditorium) *CUPM Recommendations for Programs in the Mathematical Sciences*		**Student Paper Sessions** (see schedule on separate sheet)
11:45	**Business Meetings & Elections** (Driscoll Auditorium)		
12:00	**Lunch & Table Discussions** (Dougherty Dining Hall)	**Student Competition** (Driscoll Auditorium)	**Silent Auction** (Driscoll Lobby)
1:20	**Faculty Contributed Paper Sessions** (see schedule on separate sheet)	**Workshop** ***Teaching Calculus Using a Tablet*** (Driscoll 134) *Led by Betty Mayfield; bring your tablet!*	
2:40	**Group Photo** (location TBA)		
2:50	**Invited Speaker: Charles R. Hadlock (Bentley University)** (Driscoll Auditorium) *A Mathematical Tour through a Collapsing World*		
3:45	**Reception & Silent Auction Winner Announcement** (must be present to win) (Driscoll Lobby)		
4:30	**End of Meeting**		

Note: Instructions for accessing WiFi are in the registration folder.

Gerbert d'Aurillac and the March of Spain: A Guy in the Right Place at the Right Time

Betty Mayfield
Professor of Mathematics, Hood College, MD
MAA Section Visitor
Email: mayfield@hood.edu

Abstract. Gerbert was a tenth century scholar and churchman who eventually was named Pope Sylvester II. In the Year 1000, he probably knew more mathematics than anyone else in Europe. We'll explore how that came to be.

Dr. Betty Mayfield is Professor of Mathematics at Hood College in Maryland. She has developed an interest in and love for the history of mathematics over her years of teaching. In the spring semester, she completed a sabbatical project, reading Gerbert's geometry text and comparing it to others of his time. She has served the MD-DC-VA Section of the MAA as chair and governor, and has been a first vice president of the MAA. She is currently the chair of the Committee on Sections and is especially happy to be visiting two Sections at this meeting!

Workshop:, Led by Betty Mayfield, Hood College
Teaching Calculus Using a Tablet

What can you - and your students - do on an iPad/tablet in an introductory calculus class? As it turns out, a lot! We will explore how to run a paperless classroom using tablets for reading and interacting with the text, giving lectures and taking notes, distributing and filling in discovery-oriented worksheets, graphing functions, and submitting homework.

Participants are encouraged to bring a tablet if they have one. I will demonstrate the use of the apps Notability (any app that can read and annotate pdf files is fine), Desmos (free), and Dropbox (also free), but none of these are required for participation in the workshop.

I hope that others will bring their own experiences and ideas to share.

CUPM Recommendations for Programs in the Mathematical Sciences

Martha Siegel
Professor of Mathematics, Towson University
Email: MSiegel@towson.edu

Abstract. The chair of CUPM will present the new recommendations for undergraduate mathematical science programs. There are cognitive and content goals common to all programs and specific details pertaining to the many possible tracks, minors, and interdisciplinary majors that will be important to mathematics students in the 21st century.

Dr. Martha Siegel is Professor Emerita of Mathematics at Towson University in Maryland, where she taught for 44 years. She was granted a Ph.D. from the University of Rochester having specialized in stochastic processes. She did post-doctoral work in operations research in mental health at what is now the Bloomberg School of Public Health of the Johns Hopkins University. She is a co-author of two elementary textbooks and, in the early 1980s, served as chair of a Sloan Foundation funded MAA task force on discrete mathematics in the first two years. Dr. Siegel was a member of the MAA Executive Committee from 1991-2010, first as Editor of Mathematics Magazine, and then as Secretary of the Association for fourteen years. For the past six years, she has chaired the Committee on the Undergraduate Program in Mathematics.

At Towson, she served as department chair from 2000-2004 and started Towson's Applied Mathematics Laboratory in 1980. She was a member of the University Senate for most her career at Towson, and was one of its delegates to the Council of University System Faculty for more than ten years. She served two terms as chair of that University System of Maryland group.

A Mathematical Tour through a Collapsing World

Charles R. Hadlock, Bentley University
Email: CHADLOCK@bentley.edu

Abstract. If you search the word "collapse" on Google News on any given day, you are sure to get thousands of hits, as well as a healthy reminder that we do live in a world where a very wide variety of things are collapsing every day. When assessing the risk of collapse, one's initial mindset about its source can lead to insufficient attention being paid to alternative sources. That's why financial auditors, accident investigators, and similar professionals follow systematic protocols that attempt to assure that a wide field of issues are addressed, even in the presence of strong evidence pointing in a particular direction. This same mentality is important in more general and less structured treatments of risk and possible collapse, whether to companies, currencies, species, governments, facilities, diseases, societies, or almost anything else. Mathematics provides an ideal framework for capturing the essence of a wide range of common collapse dynamics that permeate many areas of application. After all, we customarily discuss subjects like probabilities, extrema, stability, nonlinearity, games, networks, and others, all of which are closely related to possible collapses. But beyond capturing the concepts, which itself should not be underestimated as an important contribution to workers from diverse disciplines, we also offer powerful tools for going deeper to mine important insights, resolve specific uncertainties, and guide future actions. I will expand upon these ideas with examples from the real world and with some mathematical gems that many of us might not ordinarily encounter in our mathematical training or reading

Dr. Chalres R. Hadlock, a mathematics professor and former dean at Bentley University in Waltham, Massachusetts, has been working for almost 40 years in both the consulting industry and academia to help understand and manage risks. In the years following major catastrophes like Three Mile Island and Bhopal, he conducted assessments of over 200 industrial facilities worldwide on behalf of governments and multinational companies, including chemical plants, power plants, mines, hazardous waste sites, drilling rigs, and others. He has worked with the EPA to develop regulations for hazardous and radioactive materials, as well as with the City of

New York to improve hazardous materials controls in the heightened risk environment following the September 11 tragedy. He has been a visiting professor of earth, atmospheric, and planetary sciences at MIT and a visiting scholar at Wellesley College. Two of his books address risk issues: *Mathematical Modeling in the Environment* treats water, air, and hazardous materials issues, *and Six Sources of Collapse* looks at the potential for sudden shocks at both the local and global levels. He won the first Beckenbach award of the MAA for his 1978 book on Galois theory, which is still widely used. Charlie received his PhD from the University of Illinois in 1970.

FOOD FOR THOUGHT SERIES (*Lunch Table Discussions*)

Coordinators:
Dr. Agashi Nwogbaga (**EPaDel**), Professor of Mathematics & Former Chair of Math Dept., Wesley College, DE
Theresa C. Michnowicz (**MAA-NJ**), Mathematics Department, New Jersey City University, NJ

These lunch table conversations are intended to provide an opportunity for people to meet with other colleagues from around the region to discuss topics that interest them while they eat. Participants have the choice to self-assign themselves to topics and tables of their choice. So, those who do not wish to be involved or who want to just catch up with math friends will have plenty of opportunity to do that as well. Here is some information about each of the topics for the joint EPADEL & MAA-NJ meeting on Saturday, November 12, 2016 at Villanova University:

Faculty Presence and Availability on Campus – is there a problem here?
Led by Charles Hadlock, Invited Speaker, Bentley College, chadlock@bentley.edu.

Stimulating Student's Interest in Science and Math led by Dr. David DiMarco (Associate Professor of Mathematics, Neumann University) DIMARCOD@neumann.edu.
Randall Munroe wrote a fascinating book titled "What if? Serious Scientific Answers to Absurd Hypothetical Questions" and he has a website at xkcd.com. Written brilliantly and with remarkable wit, this is about how some professors sought to use these resources to stoke their student's intellectual curiosity. If anyone can do this Mr. Munroe can. Questions: "What techniques do you currently use to stoke intellectual curiosity in your math students?" "Do you think this website could be used to stoke such curiosity in your students?" These and other questions will be discussed.

AWM/MAA Discussion; Creating Community Among Women in the Profession.
Led by Betty Mayfield, Invited Speaker, Hood College, mayfield@hood.edu.

The MAA Leadership Restructuring led by **EPaDel Governor** (Dr. Lisa Marano, *Professor of Mathematics, West Chester University, PA*) and **MAA-NJ Governor** (Dr. Hieu D. Nguyen, *Professor of Mathematics, Rowan University, NJ*): First Vice President of the MAA Matt Boelkins outlines in an upcoming MAA Focus article, "Changing Times, Changing Bylaws", how the bloated structure of the Board of Governors does not allow the MAA to act nimbly enough when they must exercise fiduciary responsibilities, set policies, and react to reports received from officers, committees and senior staff. Creating a structure consisting of a smaller Board of Directors which would have oversight of these responsibilities aligns with best practices according to organizational theorists. To this end, it is being recommended in the new bylaws that the BOG be dissolved and replaced with an advisory group called a Congress. The Congress will have membership from each Section and other constituents and will have responsibilities including approving strategic goals, advising the BOD, electing at-large members of the Congress, etc. Voting to adopt the revised Bylaws will take place during the business meeting during JMM 2017. [Saturday, January 7 at 11:10 a.m.]. Discuss the proposed changes with the current governors of EPaDel and NJ over lunch and offer your input and suggestions. They will help bring your concerns and thoughts back to the MAA leadership.

Valuable Lessons from the S-STEM Program.
Led by Martha Siegel, Invited Speaker, Towson University, msiegel@towson.edu.

Faculty Contributed Sessions
Fall 2016 Joint New Jersey/EPaDel Section Meeting
12 November 2016

TIME	Driscoll Hall 244 Moderated by Kathy Turrisi	Driscoll Hall 246 Moderated by Janet Fierson
1:20	**Tony Wong** Kutztown University of PA *A two-person graph coloring game*	**Rommel G. Regis** St. Joseph's University, PA *An Introduction to Continuous Multi-Objective Optimization*
1:36	**Iwan Praton** Franklin and Marshall College, PA *Minimal tilings of the unit square*	**Eirc Stachura** Haverford College, PA *Metamaterial Lens Design*
1:52	**Robert Search** Centenary University, NJ *Mathematics and Astronomy*	**Chung Wong** The College of New Jersey *Asymptotics of Fouier coefficients of Spectral Density Functions in Two Variables*
2:08	**Garth Isaak** Lehigh University, PA *Multiset Poker*	**Baoling Ma** Millersville University of PA *Analysis of Lethal and Sublethal Impacts of Environmental Disasters on Sperm Whales using the Stochastic Modeling Approach*
2:24	**John T. Saccoman** Seton Hall University, NJ *A Survey of Laplacian Integral Graphs and Multigraphs*	**Michael Yatauro** Penn State University, Brandywine *Network Reliability and Binary Strings*

FACULTY CONTRIBUTED SESSIONS

MAA EPaDel/NJ Section Meeting -- Villanova University
12 November 2016

1:20 Driscoll 244 **Wing Hong Tony Wong** (Kutztown University of PA)

A two-person graph coloring game

Abstract: In this two-person graph coloring game, Alice and Barbara take turns to color the vertices of a given graph. Alice uses color A and Barbara uses color B, so that no neighbors of a colored vertex may share the same color. The first player who is unable to color a vertex loses the game. In this project, we determine which player has a winning strategy on certain types of graphs, such as paths, cycles, and some grids. We also prove some general assertions about all graphs. Furthermore, we discover that this game is closely related to other games introduced by John Conway and Richard Guy. This project is a joint work with Diego Manzano-Ruiz, a freshman at Kutztown University Eric Stachura, Haverford College, Haverford, PA.

1:36 Driscoll 244 **Iwan Praton** (Franklin and Marshall College, PA)

Minimal tilings of the unit square

Abstract: Tile a unit square using n smaller squares (which can be of the same size). Let S denote the sum of the side lengths of the n small squares. For example, if n=9 and the tiling uses 9 identical squares of side length 1/3, then S=3. Is there a tiling where S is bigger? smaller? Determining how large S could be for a given n seems hard (it is basically an Erdos problem), but the related problem of determining how small S could be turns out to be easier. I will discuss the solution to this question, which involves only elementary undergraduate mathematics.

1:52 Driscoll 244 **Robert Search** (Centenary University, NJ)

Mathematics and Astronomy

Abstract: The purpose of this presentation is to examine how knowledge of astronomy can enhance college-level learning situations involving mathematics. The fundamental symbiosis between mathematics and astronomy was established early in the 17th century when Johannes Kepler deduced the 3 basic laws of planetary motion. This mutually harmonious relationship between these sciences has been reinforced repeatedly in history. In the early 20th century, for example, astronomer Arthur Eddington used photographic evidence from a 1919 solar eclipse to verify Einstein's mathematical theory of relativity. This study was conducted in 5 undergraduate mathematics classes over the course of 2 years. An introductory course in ordinary differential

equations, taught in Spring Semester 2013, involved 4 students. A similar course in Spring Semester 2014 involved 6 students and a Summer 2015 Astronomy course involved 8 students. The students were asked to use Kepler's astronomical evidence to deduce mathematical laws normally encountered on an undergraduate level. They were also asked to examine the elementary mathematical aspects involved in a theoretical trajectory to the planet Neptune. The summer astronomy class was asked to draw mathematical conclusions about large numbers from the recent discoveries concerning the dwarf planet Pluto. The evidence consists primarily of videotaped PowerPoint presentations conducted by the students in both differential equations classes, along with interviews and tests given in all the classes. All presentations were transcribed and examined to determine the effect of astronomy as a generator of student understanding of mathematics. An analysis of the data indicated two findings: definite student interest in a subject previously unknown to most of them and a desire to make the mathematical connection to celestial phenomena.

2:08 Driscoll 244 **Garth Isaak** (Lehigh University, PA)

Multiset Poker

Abstract: A multiset poker hand allows repeated cards. In multiset poker every such hand is equally likely. We present a new bijection
that is more amenable for physical playing with cards than the standard multiset bijection and has some other nice properties. We also discuss some new notation that simplifies determining poker probabilities for regular poker, other variants such as dealing with replacement and multiple decks that have multiset hands as well as multiset poker with arbitrary numbers of suits, ranks and hand size.

2:24 Driscoll 244 **John T. Saccoman** (Seton Hall University, NJ)

A Survey of Laplacian Integral Graphs and Multigraphs

Abstract: The number of spanning trees in a graph or multigraph are an important measure of vulnerability to disconnection by edge failure. The eigenvalues of the Laplacian matrix associated with the graph or multigraph are used to compute the number of spanning trees. We say that a graph is a split graph if its node set can be partitioned into a clique and an independent set. A split graph G is a threshold graph if, for all pairs of nodes u and v in G, $N(u)-\{v\} \subseteq N(v)-\{u\}$ whenever $deg(u) \leq deg(v)$. We present some infinite families of graphs and multigraphs of these types, or nearly of these types, whose Laplacian eigenvalues are all integers.

1:20 Driscoll 246 **Rommel G. Regis** (St. Joseph's University, PA)

An Introduction to Continuous Multi-Objective Optimization

Abstract: Many practical optimization problems involve multiple conflicting objectives to be optimized. However, multi-objective optimization is hardly treated in standard calculus and optimization textbooks. The main goal of multi-objective optimization is to identify Pareto optimal solutions, which are solutions that cannot be improved in any of the objective functions without worsening another objective function. This talk will present some of the basic terminology and results in multi-objective optimization. It will also briefly review some of the classical and widely used approaches in solving continuous multi-objective optimization problems. In addition, it will present some theoretical results that guarantee the convergence of stochastic search methods to Pareto optimal solutions. This talk will be accessible to students with a background in multivariable calculus, linear algebra and probability.

1:36 Driscoll 246 **Eric Stachura** (Haverford College, Haverford, PA)

Metamaterial Lens Design

Abstract: .We prove how to design a lens that focuses monochromatic radiation from a light source into a given point when the lens is constructed out of an exotic material known as a Metamaterial (meta = $\mu\varepsilon\tau\alpha$ = ``beyond'' in Greek). Such materials do not exist naturally, but have been constructed in the laboratory in the early 2000's. The research on the behavior of these materials has been extremely active in recent years, especially for applications to invisibility cloaking and the development of a ``superlens'', which can in principle image objects at the smallest scales. In this talk I will discuss the precise construction of the lens; i.e., given one surface of the lens, we construct the second surface explicitly, and show that most of the time the slab has a non-rectangular geometry, even if the given surface is planar. Most of the mathematics involved should be understandable to calculus students.

1:52 Driscoll 246 **Chung Wong** (The College of New Jersey)

Asymptotics of Fouier coefficients of Spectral Density Functions in Two Variables

Abstract: We look at the asymptotic of the Fourier coefficients of spectral density functions along different directions in two variables. We use theories developed by Geronimo and Woerdeman for directions in the second and fourth quadrants. For the first and third quadrants, we use theories by Pemantle and Wilson.

The one variable Bernstein-Szegő moment problem asks when does a given finite list of complex numbers from the Fourier coefficients of the spectral density function of a stable polynomial. Szegő proved in 1919 that it is possible if and only if the Toeplitz matrix formed by these numbers is positive definite. Bernstein later proved in 1930 a real line analog of the problem. The two variable version of the problem was proven by Geronimo and Woerdeman in 2004. Related problems arise from the studies of the moment problem in higher dimensions. Of particular interest is to determine any relations between the Fourier coefficients and the coefficients of the stable

polynomial. In this presentation, I will briefly describe one of such relations, which focus on the asymptotics of the Fourier coefficients and the different methods used to prove it.

2:08 Driscoll 246 **Baoling Ma** (Millersville University of PA)

Coauthors: Azmy S. Ackleh, Ross A. Chiquet, Tingting Tang, Hal Caswell, Amy Veprauskas, and Natalia Sidorovskaia

Analysis of Lethal and Sublethal Impacts of Environmental Disasters on Sperm Whales using the Stochastic Modeling Approach

Abstract: The Deepwater Horizon (DWH) oil rig explosion in April of 2010 has encouraged substantial research efforts to better understand how such environmental disasters affect the resilience of the Gulf of Mexico (GoM) ecosystem. This talk is focused on how such disasters affect the dynamics and persistence of marine mammal populations in the Northern GoM under certain assumptions. Matrix population models are developed to study the lethal and sublethal impacts of such environmental disasters on the GoM sperm whales. We investigate how reductions in the survival probabilities and in fecundity affect the sperm whale population. We show that a reduction of as little as 0.81% in adult survival and double that in immature survival could reduce the asymptotic growth rate below one, which indicates population decline. Meanwhile, it would take a 34% reduction in the fecundity to have the same effect. We then investigate the long term effect of such an environmental disaster on the population of sperm whales in the GoM. We also inspect the effects of demographic stochasticity on the recovery probabilities and the recovery time of the population.

2:24 Driscoll 246 **Michael Yatauro** (Penn State University, Brandywine)

Network Reliability and Binary Strings

Abstract: We define a network model involving failure of edges and endpoints which is dependent on a specified parameter. If the network is defined by a path, then the vulnerability of the network within this model can be studied using a specific set of binary strings. We define those strings and present a recursive formula for counting them.

Let G be a finite simple graph. Consider a model in which edges of G fail independently, and when an edge fails we remove it from G along with the incident vertices (this is sometimes called an *edge explosion*). We say that a set of edges F is a *failure set* of G if after all edges of F fail, the components of the induced subgraph each contain at most $k-1$ vertices, for some prescribed $k>0$. If the edges fail with probability ρ, then the *unreliability* of G, denoted $U_k(G,\rho)$, is the probability that a randomly selected set of edges is a failure set. Let P_n be the path on n vertices. For any fixed value of k, we will demonstrate how counting appropriate binary strings allows us to generate a recursive formula on n for $U_k(P_n,\rho)$.

Student Contributed Paper Sessions

Eastern Pennsylvania and Delaware Section
and New Jersey Section
of the Mathematical Association of America

Villanova University

November 12, 2016

Session I-A: Graduate Student Talks (Driscoll Hall 221)

10:50 *The Littlewood-Paley Theorem: A Substitution for Orthogonality on L^p*
Danielle Smiley, Bryn Mawr College

11:10 *Corners in Tree--Like Tableaux*
Amanda Lohss, Drexel University

11:30 *Counting Colorful Tilings of Rectangular Arrays*
Sara Robertson, Villanova University

Session I-B: Graduate Student Talks (Driscoll Hall 244)

10:50 *Periods of Iterated Rational Functions over a Finite Field*
Charles Burnette, Drexel University

11:10 *Explicit Formula for the Mean Square of a Dirichlet L-function of Prime Power Modulus*
Frank Romascavage, III, Bryn Mawr College

11:30 *Lagrangian Fillings of Legendrian Knots*
Samantha Pezzimenti, Bryn Mawr College

Session I-C: Graduate Student Talks (Driscoll Hall 246)

10:50 *Analysis of Numerical Solutions to the Non-Linear Schrödinger Equation*
Matthew Moore, Delaware State University

11:10 *A Case-Study Analysis of Numerical Methods for Solutions of Initial Value Problems*
Yahui Xiao, Delaware State University

11:30 *Eigensurfaces and the Passenger Side Mirror*
Sarah Rody, Drexel University

Session I-D: Undergraduate Student Talks (Driscoll 223)

10:50 *Analysis of Solar Energy in Delaware and Around the World*
Christina Hubert, Wesley College

11:05 *Investigating Restricted Rho*
Elijah Carrick, Gettysburg College

11:20 *Rho, Rho, Rho Your Boat: On the Minimum Size of a 3-fold Restricted Sumset of an m-element Subset of* Z_{p^r}
Bailey Heath, Gettysburg College

11:35 *Fibonacci Sequences*
Mia Vega, Alyse Parker, Oberon Wackwitz, University of the Sciences

Session I-E: Undergraduate Student Talks (Driscoll Hall 225)

10:50 *Modeling the 2013-2015 Ebola Outbreak in West Africa Using Differential Equations of SIR Form and Markov Matrices*
Ronald Berna, Villanova University

11:05 *Mathematical Modeling of Epidemics*
Karla Keler, Delaware Valley University

11:20 *Another One Bites the Dust*
Brandi Henry, Eastern University

11:35 *The influence of Artificial Intelligence on chess.*
Stephen Seach, Patrick Reagan, Ryan D'Elia, University of the Sciences

Session I-F: Undergraduate Student Talks (Driscoll Hall 248)

10:50 *An Investigation of Edge-Distinguishing Graph Coloring*
Nathaniel Benjamin, Kutztown University

11:05 *Playing Partizan Combinatorial Games on Paths*
Devon Vukovich, Moravian College

11:20 *The Rubik's Cube*
Aaron Hogan, Colleen Walsh, Rebecca Colandrea, University of the Sciences

11:35 *An Efficient Filtering Algorithm to Construct New Non-Binary Insertion/Deletion Codes*
Alex Drumm, Rowan University

Session I-G: Undergraduate Student Talks (Bartley Hall 024)

10:50 *A Recursive Formula For Hikita Polynomials on 3 Rows*
Debdut Karmakar, Drexel University

11:05 *Mathematics of Autonomous Cars*
Oleg Davydovich, Joey Harmon, Bryan Figula, University of the Sciences

11:20 *New Metrics of Economic Inequality*
Tasha Boland, Shantel Silva, Villanova University

11:35 *Harry Markowitz and Modern Portfolio Theory (MPT)*
Christine Emminger, Penn State Harrisburg

Session I-H: Undergraduate Student Talks (Bartley Hall 026)

10:50 *Fractals*
Ashley Cai, Nhu Truong , Judy Fang, University of the Sciences in Philadelphia

11:05 *Houdini's Escape*
Sara Juarez-Mendoza, Franklin and Marshall College

11:20 *Sepsis Safari: Predictive Data Analysis on Wild Data*
Alexander Murph, Alexander Robinson, Bucknell University

11:35 *A Mathematical Model for the Interactions Between Plasmodium Falciparum Malaria Parasite and Host Immune Response*
Jack Warner, Millersville University

Eastern Pennsylvania and Delaware Section
and New Jersey Section
of the Mathematical Association of America

Student Contributed Paper Session Abstracts

Villanova University

November 12, 2016

Student Speakers

Graduate Session I-A
Driscoll Hall 221

Danielle Smiley, Bryn Mawr College
Title: The Littlewood-Paley Theorem: A Substitution for Orthogonality on L^p
Time: Session I-A 10:50am Driscoll Hall 221
Abstract: *The orthogonality properties of the Fourier Transform over L^2 are well-understood in Harmonic Analysis, but is there a way to take advantage of such an important characteristic over other spaces? Littlewood and Paley developed a theory in the 1930's which manifests the critical orthogonality properties for suitable functions over L^p spaces. Later, it was found that their theory characterizes many other function spaces, including Sobolev spaces, Lipschitz spaces, and Hardy spaces. In this talk, we will showcase the Littlewood-Paley Theorem, provide a sketch of its proof, and discuss its remarkable characterization of certain function spaces, specifically L^p spaces.*

Amanda Lohss, Drexel University
Title: Corners in Tree–Like Tableaux
Time: Session I-A 11:10am Driscoll Hall 221
Abstract: *Tree–like tableaux are combinatorial objects which exhibit a natural tree structure and are connected to the partially asymmetric simple exclusion process (PASEP). There was a conjecture made on the total number of corners in tree–like tableaux and the total number of corners in symmetric tree–like tableaux. We have proven both conjectures based on a bijection with permutation tableaux and type–B permutation tableaux. In addition, we have shown that the number of diagonal boxes in symmetric tree–like tableaux is asymptotically normal and that the number of occupied corners in a random tree–like tableau is asymptotically Poisson. This extends earlier results of Aval, Boussicault,Nadeau, and Laborde Zubieta, respectively.*

Sara Robertson, Villanova University
Title: Counting Colorful Tilings of Rectangular Arrays
Time: Session I-A 11:30am Driscoll Hall 221
Abstract: *How many ways are there to tile a rectangular board with painted squares and dominoes, when there are a available colors for the squares and b available colors for the dominoes? There is no closed-form expression for the number of tilings of an m by n board with dominoes and squares, but the problem has been extensively studied in the area of mathematical physics, where the pieces are called monomers and dimers. In this talk we will derive a recursive formula for the number of colorful tilings of a 2 by n board with squares, dominoes, and trominoes. We will also show how a modification of the same method can be used to find a recursion for the number of colorful tilings of a 3 by n board with squares and dominoes.*

Graduate Session I-B
Driscoll Hall 244

Charles Burnette, Drexel University
Title: Periods of Iterated Rational Functions over a Finite Field
Time: Session I-B 10:50am Driscoll Hall 244
Abstract: *If f is a polynomial of degree d in $\mathbb{F}_q[x]$, let $c_k(f)$ be the number of cycles of length k in the directed graph on $\mathbb{F}_q$ with edges $\{(v, f(v))\}_{v\in\mathbb{F}_q}$. For random polynomials, the numbers $c_k, 1 \leq k \leq b$, have asymptotic behavior resembling that for the cycle lengths of random functions $f : [q] \to [q]$. However random polynomials differ from random functions in important ways. For example, given the set of cyclic (periodic) points, it is not necessarily true that all permutations of those cyclic points are equally likely to occur as the restriction of f. In this talk, we prove a lower bound for the average value of $\log T$: if $d = d(q) \to \infty$, but $d = o(\sqrt{q})$, then the expected value of $\log T$ is $\mathbb{E}(\log T) := \frac{1}{q^d(q-1)} \sum \log T(f) > \frac{d}{2}(1 + o(1))$, where the sum is over all $q^d(q-1)$ polynomials of degree d in $\mathbb{F}_q[x]$. Similar results are proved for rational functions.*

Frank Romascavage, III, Bryn Mawr College
Title: Explicit Formula for the Mean Square of a Dirichlet L-function of Prime Power Modulus
Time: Session I-B 11:10am Driscoll Hall 244
Abstract: *We seek to derive an explicit formula for the mean square of a Dirichlet L-function of prime power modulus. Motohashi derived an explicit formula for the mean square (second power moment) and also the fourth power moment of the Riemann Zeta Function. There are many estimates on the power moments for a Dirichlet L-function, but this work will not include an error term. The functional equations for L-functions (pending on whether the character is primitive or not) imply that a great deal of hidden information about $L(s, \chi)$ exist where $0 \leq Re(s) \leq 1$. In several important problems in analytic number theory, including how primes are distributed, estimates such as power moments are sufficient.*

Samantha Pezzimenti, Bryn Mawr College
Title: Lagrangian Fillings of Legendrian Knots
Time: Session I-B 11:30am Driscoll Hall 244
Abstract: *A smooth knot in the 3-sphere can bound many topologically distinct smooth surfaces in the 4-ball. However, if the knot and the surface satisfy extra geometric conditions coming from symplectic geometry, this is not always true. In fact, it is often the case that the knot completely determines the topology of an embedded filling surface. In this talk, I will introduce these geometric knots and surfaces, namely Legendrian knots and Lagrangian fillings, and discuss my current research to understand the topology of immersed Lagrangian fillings.*

Graduate Session I-C
Driscoll Hall 246

Matthew Moore, Delaware State University
Title: Analysis of Numerical Solutions to the Non-Linear Schrödinger Equation
Time: Session I-C 10:50am Driscoll Hall 246
Abstract: *In this work, we consider the Non-Linear Schrödinger Equation (NLSE) and its solutions. The applications and appearances of this equation are vast, with some of the most familiar applications in the wave propagation of light in a media. The understanding of the propagation of light has numerous applications in the field of optics, including the properties of lasers and the effect of light on the human eye. We will discuss the basic nature of solutions to the NLSE through an analytic method known as the Inverse Scattering Transform, and then consider the NLSE in scenarios where an analytic solution may (or may not) be easily obtainable. Here we focus on an analysis of numerical methods, including the Crank-Nicolson scheme and the Chebyshev Spectral Collocation method, and discuss a couple modifications to these methods with have shown promising results in the present day research of numerical partial differential equations. We discuss and compare their results.*

Yahui Xiao, Delaware State University
Title: A Case-Study Analysis of Numerical Methods for Solutions of Initial Value Problems
Time: Session I-C 11:10am Driscoll Hall 246
Abstract: *In this work, we consider the general initial value problem on a finite domain* $y'(x) = f(x, y), x \in [a, b], y(a) = \alpha$. *We will analyze a few of the classical numerical methods on solving initial value problems, such as the Euler, Taylor, Modified Euler, and Runge-Kutta methods. We briefly describe each of their origins as well as the accuracy for each of the methods. We compare their accuracy to an initial value problem for which we are able to obtain an analytic solution, and then rely on the convergence of the numerical method to solve an initial value problem for which an analytical solution is not easily accessible.*

Sarah Rody, Drexel University
Title: Eigensurfaces and the Passenger Side Mirror
Time: Session I-C 11:30am Driscoll Hall 246
Abstract: *The standard passenger side mirror on a motor vehicle has a limited field of view, which results in a blind spot. Other mirrors, such as spherical mirrors, reduce the blind spot but distort the image. Our technique, the method of eigensurfaces, allows us to construct a reflector using finite differences. The resulting mirror has a wider field of view than a standard passenger side mirror, but less distortion than a spherical mirror.*

Undergraduate Session I-D
Driscoll Hall 223

Christina Hubert, Wesley College
Title: Analysis of Solar Energy in Delaware and Around the World
Time: Session I-D 10:50am Driscoll Hall 243
Abstract: *In this work, we present a critical analysis of solar energy as an important renewable energy resource in Delaware and around the world. As Delaware strives to increase its renewable energy output in keeping with the Renewable Energy Portfolio Standards Act of 2005 (Title 26 of the Delaware Code) that mandates* 25% *renewable energy in Delaware by 2025-2026, a critical analysis of solar energy as a key renewal energy resource in Delaware is important. Mathematics plays key roles in solar energy generation, distribution and evaluation. The concept of using solar energy as an energy source to reduce the use of fossil fuels is a widely-discussed issue especially as our fossil fuels are being consumed rapidly and we are forced to look at alternative modes of energy production. Benefits and associated disadvantages of solar energy will also be discussed.*

Elijah Carrick, Gettysburg College
Title: Investigating Restricted Rho
Time: Session I-D 11:05am Driscoll Hall 223
Abstract: *We will be working with restricted sumsets. The function,* $\hat{\rho}(G, m, h)$*, is defined as the minimum size of an* h*-fold restricted sumset of an subset with size* m*. In this presentation we find values for* $\hat{\rho}(G, 5, 2)$*, for any abelian group* G*. Specifically, we find when* $\hat{\rho}(G, 5, 2) = 5$*,* 6*, and* 7*.*

Bailey Heath, Gettysburg College
Title: Rho, Rho, Rho Your Boat: On the Minimum Size of a 3-fold Restricted Sumset of an m-element Subset of Z_{p^r}
Time: Session I-D 11:20am Driscoll Hall 223
Abstract: *We are interested in finding the minimum size of a 3-fold restricted sumset of an* m*-element subset of* Z_{p^r} *for some prime number* p*. We use the notation* $\hat{\rho}(Z_{p^r}, m, 3)$ *for this. Here, we focus on the groups* $Z_{2^r}, Z_{3^r}, and Z_{5^r}$*. We find upper bounds for all* m *for* $\hat{\rho}(Z_{2^r}, m, 3)$ *and* $\hat{\rho}(Z_{3^r}, m, 3)$ *and for* $m \leq 125$ *for* $\hat{\rho}(Z_{5^r}, m, 3)$*.*

Mia Vega, Alyse Parker, Oberon Wackwitz, University of the Sciences
Title: Fibonacci Sequences
Time: Session I-D 11:25am Driscoll Hall 223
Abstract: *In mathematics a sequence refers to an infinite series of ordered numerical values; though some of these sequences are random, many evolve to form a pattern. One such sequence is the famous Fibonacci sequence. In this talk we will discuss this sequence along with a brief history of its uncovering, what it is, and some examples of its real world occurrences and applications in science.*

Undergraduate Session I-E
Driscoll Hall 225

Ronald Berna, Villanova University
Title: Modeling the 2013-2015 Ebola Outbreak in West Africa Using Differential Equations of SIR Form and Markov Matrices
Time: Session I-E 10:50am Driscoll Hall 225
Abstract: *The 2014-2016 Ebola outbreak in West Africa was unprecedented in both epidemic size and geographic area affected, infecting over 27,000 individuals in Sierra Leone, Guinea, and Liberia. Despite the efforts of Doctors Without Borders and the World Health Organization, containment was difficult due to political instability, a lack of medical infrastructure, public mistrust of health officials, and movement. Many modeling approaches for the epidemic have been attempted. We used an SIR model of time-dependent differential equations to model the spread of the current outbreak. Moreover, a hybrid model incorporating Markov matrix manipulation was utilized to mimic more reasonable, isolated population movement. With data from the current epidemic, these models were used to examine the implementation of proper burial practices, the effect of earlier or later intervention, and the optimal quarantine practices in order to assist present efforts and guide public health efforts in future outbreaks.*

Karla Keler, Delaware Valley University
Title: Mathematical Modeling of Epidemics
Time: Session I-E 11:05am Driscoll Hall 225
Abstract: *Infectious diseases are a major health problem throughout the world. This project develops a simple model of the spreading of a disease. It looks to investigate the mechanisms of an outbreak and the spread of a disease to predict future course and control the epidemic. Our questions of interest are, will the infection spread, how will it evolve over time, when will the spread disappear and what is the final outcome, at what rate will this reduction have to be accomplished to keep the epidemic under control, and can we predict what portion of the community will eventually catch the disease before the epidemic is over? The software MATLAB is applied to run different scenarios, to answer our questions of interest not only analytically, but numerically and graphically and to help health professionals to see how well they prepared, what needed to be changed to control the epidemics*

Brandi Henry, Eastern University
Title: Another One Bites the Dust
Time: Session I-E 11:20am Driscoll Hall 225
Abstract: *One way to describe an epidemic is through the susceptible-infected-recovered (SIR) model. Individuals move from group to group as the disease proliferates through the population. Probability equations concerning the severity of the outbreak whether it is major or minor can be derived, somewhat counterintuitively, without defining what it means for an epidemic to be major or minor. Using differential equations, a theoretical, stochastic epidemic can be simulated, allowing us to test accepted equations for accuracy. By constructing a definition of a major outbreak and running simulations, an experimental probability of a major outbreak can be determined and compared to the derived, expected probability.*

Stephen Seach, Patrick Reagan, Ryan D'Elia, University of the Sciences
Title: The influence of Artificial Intelligence on chess.
Time: Session I-E 11:35am Driscoll Hall 225
Abstract: *Our presentation is on the topic of computer chess and similar computer strategy architecture. We will first look at its origins, and those of similar computer-based strategy games, and look at the hardware and software limitations that it faced. We will look at how chess computations and algorithms work and how they improved over time, cultivating in computer chess now being able to easily beat even the best human players. We will also consider the role that computer chess now plays in the chess world, and the advantages that it provides to chess players and our understanding of logic.*

Undergraduate Session I-F
Driscoll Hall 248

Nathaniel Benjamin, Kutztown University
Title: An Investigation of Edge-Distinguishing Graph Coloring
Time: Session I-F 10:50am Driscoll Hall 248
Abstract: *Graph coloring is an important concept commonly discussed within the subject of graph theory that has been investigated in a number of different ways. This talk will initially address the process of graph coloring and introduce several methods thereof, focusing primarily on the manner of coloring the vertices of a graph in such a way that distinguishes the edges by their incidence-defined color. Numerous examples of this coloring method will be included, as well as an algorithm used to color a graph in such a way. Additionally, interesting sequences of the edge-distinguishing chromatic number (EDCN) of particular families of graphs will be featured throughout the talk, with conclusive results and areas of further investigation provided.*

Devon Vukovich, Moravian College
Title: Playing Partizan Combinatorial Games on Paths
Time: Session I-F 11:05am Driscoll Hall 248
Abstract: *Mathematical games are used to analyze and describe strategic decision making. The game being analyzed here is one in which players alternate turns deleting different components from a graph without fulfilling a "losing" criteria. The component being deleted and the "losing"? criteria determine a set of failure states for each player that he cannot play on. The goal is to be able to determine the winner of a game depending only on the failure states of each player without playing through all possible combinations of moves. Some initial results have been obtained and will be discussed for this game played on paths.*

Aaron Hogan, Colleen Walsh, Rebecca Colandrea, University of the Sciences
Title: The Rubik's Cube
Time: Session I-F 11:20am Driscoll Hall 248
Abstract: *The Rubik's cube is a mathematical game. The object of the game is to get all one color on each of the 6 sides of the cube. There is an algorithm behind the solution to the cube. In this talk we will give the history of the game and an algorithm to solve the game.*

Alex Drumm, Rowan University
Title: An Efficient Filtering Algorithm to Construct New Non-Binary Insertion/Deletion Codes
Time: Session I-F 11:35am Driscoll Hall 248
Abstract: *We present a filtering algorithm to detect twin codewords in the construction of generalized Tenengolts codes, which after purging yields non-binary codes capable of correcting multiple insertion/deletion errors. As a result we obtain new codebooks with cardinalities larger than non-binary Helberg codebooks.*

Undergraduate Session I-G
Bartley Hall 024

Debdut Karmakar, Drexel University
Title: A Recursive Formula For Hikita Polynomials on 3 Rows
Time: Session I-G 10:50am Bartley Hall 024
Abstract: *Rational q,t-Catalan polynomials can be realized as a fundamental type of parking function, which are studied in abstract algebra, combinatorics, physics, statistics, and computer science. By utilizing the set of all parking functions, in 2012 Hikita introduced a further generalization of Catalan polynomials, which arise in the study of diagonal harmonics. Since then a great deal of research has been spent toward understanding these Hikita polynomials. In our research we discovered that Hikita polynomials with at most 3 rows have a recursive description involving lower-order Catalan polynomials. This means that Hikita polynomials can be described in terms of Catalan polynomials, which have been studied to great extent. This result suggests that such recursive formulas exist for higher order Hikita polynomials.*

Oleg Davydovich, Joey Harmon, Bryan Figula, University of the Sciences
Title: Mathematics of Autonomous Cars
Time: Session I-G 11:05am Bartley Hall 024
Abstract: *Autonomous driving is an up and coming technology which will revolutionize the automobile industry. Autonomous utilize algorithms to reach their destination with minimal error. In our talk, we will discuss the various processes that allow autonomy such as: Monte Carlo localization algorithms and Markov localization algorithms and Kalman filters.*

Tasha Boland, Shantel Silva, Villanova University
Title: New Metrics of Economic Inequality
Time: Session I-G 11:20am Bartley Hall 024
Abstract: *The Gini coefficient is a well known metric used to study economic inequality in a population. We study a new metric proposed by Volpert and Jantzen (2012) to measure income inequality: a metric that considers both the low and high ends of the income spectrum, leading to two separate indices. Using Monte Carlo methods, we compare these indices to other metrics of economic inequality.*

Christine Emminger, Penn State Harrisburg
Title: Harry Markowitz and Modern Portfolio Theory (MPT)
Time: Session I-G 11:35am Bartley Hall 024
Abstract: *Harry Markowitz is a leader of Financial Analysis. By graphing and applying statistical models to the market he was about to generate ideas that affected our perception of the money market. Modern Portfolio Theory (MPT) is the foundation for investment analysis in today's finance classes. Starting with his career and continuing through present day, he has contributed to the fields of mathematics, computer science and economics. Markowitz is still alive today, just as his ideas are. He created MPT based on using the expected return of the stock $E(r_i)$, the risk in the market σ, the probability of different scenarios in the market, and the weight or proportion of stock to the overall investment portfolio, correlation coefficient ρ, market risk β, to produce an excess return α.*

Undergraduate Session I-H
Bartley Hall 026

Ashley Cai, Nhu Truong , Judy Fang, University of the Sciences in Philadelphia
Title: Fractals
Time: Session I-H 10:50am Bartley Hall 026
Abstract: *In this presentation, we will talk about the history of fractals and some of its applications in the nature. Also we will talk about some mathematical properties.*

Sara Juarez-Mendoza, Franklin and Marshall College
Title: Houdini's Escape
Time: Session I-H 11:05am Bartley Hall 026
Abstract: *Houdini was a magician who was popular for his escape performances. In this talk, we describe a specific example of a performance Houdini might have done. In this scenario he is handcuffed to a block in a giant flask; as he makes his escape, water starts to fill up the flask. Using concepts of related rates from Calculus, we calculate the volume of the flask and the rate the water pours in. Will he have enough time to escape before the flask fills up and he drowns?*

Alexander Murph, Alexander Robinson, Bucknell University
Title: Sepsis Safari: Predictive Data Analysis on Wild Data
Time: Session I-H 11:20am Bartley Hall 026
Abstract: *Sepsis is a syndrome of uncontrolled inflammation caused by infection. It is among the leading causes of death in the United States, and among the most expensive to treat. Septic Shock is a subset of Sepsis that has a higher mortality rate. Previous studies have focused on predicting sepsis and septic shock using machine learning algorithms and a publically available domesticated? data set called MIMIC-II. We replicate previous experiments using a wild? dataset from Geisinger Medical Center, and compare them to the same experiments run on MIMIC-II.*

Jack Warner, Millersville University
Title: A Mathematical Model for the Interactions Between Plasmodium Falciparum Malaria Parasite and Host Immune Response
Time: Session I-H 11:35am Bartley Hall 026
Abstract: *A new system of structured partial differential equations coupled with ordinary differential equations is established to investigate the population dynamics of Plasmodium falciparum and its interaction with red blood cells and cells of the immune system. A finite difference scheme is developed to solve the system. The newly developed model is applied to study the interplay between host immune response and parasite dynamics and investigate crucial experimental parameters for reliable prediction of treatment strategies.*

MAA-NJ Fall 2016 Newsletter

Report of the Board of Governors meeting August 3 at MathFest 2016

The Board of Governors (BOG) passed a resolution to revise MAA bylaws to restructure governance model: Board of Directors (9 officers), Congress consisting of representatives elected by each section. Resolution will be voted on by MAA membership at next business meeting in Atlanta at JMM 2017 on Saturday, Jan. 7, 2017. Section members should read forthcoming MAA Focus article by Matt Boelkins, "Changing Times, Changing Bylaws." Perhaps MAA-NJ should post revised bylaws on the Section's Facebook page and allow viewers to post comments and questions.

Board had group discussions to revise the MAA's mission statement and add a vision statement and description of values in order attract new members by helping to make them connect with MAA through shared values.

MAA is committing significant resources to increase its presence on social media. A math news app for IPad/IPhone is being developed by MAA President Francis Su to help members keep up-to-date with math-related news and stay connected with MAA activities and products. It will also allow members to easily view MAA journal articles. Currently under beta testing.

MAA-NJ Section's revised bylaws approved by BOG. Congratulations and thanks to all those involved in the many discussions that led to the revisions.

BOG approved the resolution by the Committee on MAA/Department Liaisons to eliminate the national liaison program and dissolve the liaison committee. However, sections are encouraged to continue with their own liaison programs and maintain contacts with math departments in their section.

US team wins 57th International Mathematical Olympiad (IMO) in Hong Kong in July 2016 for the second year in a row. All team members were awarded gold medals.

Respectfully submitted,
Hieu Nguyen, Governor of MAA-NJ Section

Report of the Section Officers Meeting at MathFest 2016

This year's discussion at the Section Officers' meeting comprised of two main topics: Liaisons at the Association Level versus Section Level, and SIGMAAs.

The MAA has passed a resolution to eliminate the Liaisons program at the national level; however, sections are encouraged to continue to run their own liaison programs in a way that is best fitting for the individual section. We also discussed some effective uses

of a liaison program, including using it as a source for award nominations, new committee members, and a way to get non-MAA members information about the MAA.

The next presentation was about SIGMAAs. SIGMAAs and MAA sections can be mutually beneficial to one another. Many SIGMAA members could utilize our section meetings as opportunities to expand their contributions to mathematics, while MAA Sections may be able to use a list of SIGMAA members to seek out speakers and/or workshop facilitators within their geographical area to reduce costs for travel.

Respectfully submitted,
Jonathan Weisbrod

Future Meetings

MAA-NJ. The Spring 2017 MAA-NJ Section meeting will be held at The College of New Jersey on Sunday, March 26. The Fall 2017 MAA-NJ Section meeting will be at Georgian Court University on Saturday, November 4.

GSUMC. The Garden State Undergraduate Mathematics Conference will be held in conjunction with the Spring Meeting at The College of New Jersey. It will include poster and oral presentations sessions for undergraduate students, as well as a team mathematics-problem competition. Contact david.trubatch@montclair.edu to volunteer. See the GSUMC web site: http://sections.maa.org/newjersey/GSUMC.html**.**

National MAA Meeting. The 2017 Joint Math Meeting will be in Atlanta, January 4 – 7.

MathFest. The MAA will hold its 2017 MathFest in Chicago, July 26 – 29.

Call for Contributed Papers and Lunch Table Discussion Topics for the Spring 2017 MAA-NJ Meeting

Submit a title, three- to four-sentence abstract, and one-page description in MS Word to the session organizer by **February 2, 2017.**

1. *Preparing Students for College Calculus: Spotlighting Successful Precalculus Programs.* Organizer: Tom Hagedorn, The College of New Jersey, hagedorn@tcnj.edu.
2. *Recreational Mathematics*. Organizer: David Nacin, William Paterson University, nacind@wpunj.edu.
3. *Statistics: Practice and Pedagogy*. Organizer: Dexter Whittinghill, Rowan University, whittinghill@rowan.edu.

MAA members interested in leading a Lunch Table Discussion at the Spring 2017 meeting are asked to submit their proposals to Theresa C. Michnowicz, New Jersey City University, tmichnowicz@njcu.edu, by **February 2, 2017.**

Maa Elected Officer Nominations

The nominating committee presents the following recommended slate of candidates.

Chair	Aihua Li, Montclair State University
Secretary	Zhixiong Chen, New Jersey City University
VC for Fall Meetings	Sarita Nemani, Georgian Court University
VC for Spring Meetings	Elizabeth Uptegrove, Felician University
VC for Speakers	Amanda Beecher, Ramapo College
VC for Student Activities	David Trubatch, Montclair State University
VC for Two Year Colleges	Jonathan Weisbrod, Rowan College at Burlington County

Call for Nominations for the MAA-NJ Award for Distinguished College or University Teaching

The MAA-NJ Section Distinguished Teaching Award Selection Committee is seeking nominations for the 2016 award. Please consider nominating an inspiring, respected, or influential deserving colleague for this prestigious award. Nomination information is posted at http://www.maa.org/newjersey. Contact Zhixiong Chen (Secretary, MAA-NJ) at zchen@njcu.edu for more information. Nominations are due by November 20, 2016.

MAA-NJ Committees

Awards Committee: Carol Avelsgaard, Middlesex County Community College; Karen Clark (ex-officio), The College of New Jersey; Bonnie Gold (chair), Monmouth University; Theresa Michnowicz, New Jersey City University; Dexter Whittinghill, Rowan University.

Nominating Committee: Karen Clark (ex-officio), The College of New Jersey; Lawrence D'Antonio, Ramapo College; Bonnie Gold, Monmouth University; Tom Hagedorn (chair), The College of New Jersey; David Marshall, Monmouth University; Hieu Nguyen, Rowan University.

Teaching Award Committee: Karen Clark (ex-officio), The College of New Jersey; Brian Hopkins, Saint Peter's University; Sarita Nemani, Georgian Court University; Diana Thomas, Montclair University.

Selection Committee for Contributed Papers: NJ: Theresa Michnowicz (ex-officio), New Jersey City University; Olcay Ilicasu, Rowan University; Kathy Turrisi (chair), Centenary University. **EPaDel:** Christopher Catone, Albright College; Janet Fierson, LaSalle University.

NJAMTE Call for Papers. The New Jersey Association of Mathematics Teacher Educators invites contributed papers at its 2017 meeting at The College of New Jersey on June 2. See http://bit.ly/njamte or contact Maria DeLucia at MDeLucia@middlesexcc.edu.

Social Media Information

Facebook:	https://www.facebook.com/maanewjersey
Instagram:	https://instagram.com/maanewjersey
Twitter:	https://twitter.com/maanewjersey
Email:	maanj.socialmedia@gmail.com. Please email us with your news.

MAA-NJ Section Officers

Governor	Hieu Nguyen, Rowan University
Chair	Karen Clark, The College of New Jersey
Past Chair	Thomas Hagedorn, The College of New Jersey
Vice-Chair for Speakers	Aihua Li, Montclair State University
Vice-Chair for Two-Year Colleges	Tatyana Stepanova, Raritan Valley Community College
Vice-Chair for Student Activities	A. David Trubatch, Montclair State University
Secretary	Zhixiong Chen, New Jersey City University
Treasurer	Paul von Dohlen, William Paterson University
Advance Meeting Planner	Bonnie Gold, Monmouth University
Book Sale Coordinators	Dirck Uptegrove, Nokia; Elizabeth Uptegrove, Felician University
Contributed Paper Organizer	Theresa C. Michnowicz, New Jersey City University
Door Prize Coordinator	Linda Ritchie, Centenary University
GSUMC Director	A. David Trubatch, Montclair State University
Historian	Lawrence D'Antonio, Ramapo College
Liaison Coordinator	Jonathan Weisbrod, Rowan College at Burlington County
Lunch Table Discussions Organizer	Theresa C. Michnowicz, New Jersey City University
Program Editor	Elizabeth Uptegrove, Felician University
Project NJ-NExT Co-Directors	Kaaren Finberg, Ocean County College; Jana Gevertz, The College of New Jersey
Social Media Director	Grace Cook, Bloomfield College
Webmaster	Dirck Uptegrove, Nokia
Workshop Organizer	Zachary Kudlak, Monmouth University