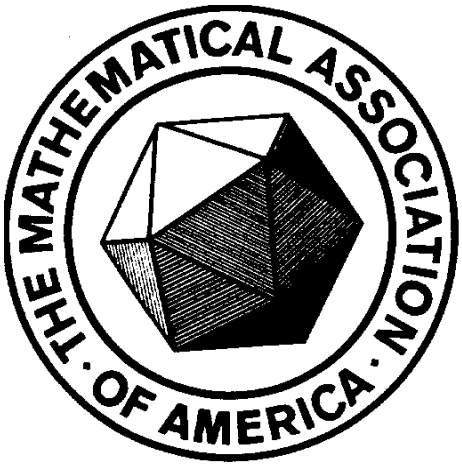
Mathematical Association of America
Fall 2019 Joint Meeting of the
New Jersey and Metro New York Sections



Essex County College
303 University Avenue
Newark, NJ

Saturday, October 26, 2019

Mathematical Association of America
New Jersey and New York Metro Sections, Fall 2019 Meeting Program
All events take place in the Megastructure Building

8:30 – 9:30	**Registration and Coffee**; Reception Area
9:00 – 1:30	**Book Exhibits**; Reception Area
9:30 – 9:40	**Welcome by Dr. Denis Blackmore**, Professor NJIT and Recipient of MAA Teaching Excellence Award; Siegler Hall
9:40 – 10:30	**Group Locomotion in Fluids,** *Jun Zhang, NYU*. Presider: Satyanand Singh, CUNY; Siegler Hall
10:30 – 10:45	**MAA-NJ Business Meeting**; room 2115
10:45 – 11:10	**Intermission and Book Exhibits**; Reception Area
11:10 – 12:00	**Counting Curves: Tales from the Enumerative Crypt***, Susan Jane Colley, Oberlin College.* Presider: Dawn Nelson, Saint Peter's University; Siegler Hall
12:00 – 1:30	**Lunch**; rooms 2101B, 2110, 2111, 2113, and 2115
1:30 – 2:45	**Workshop:** *Encouraging Creativity in Mathematics,* Presented by Mika Munakata, Ashwin Vaidya, and Ceire Monahan, Montclair State University; room 4135
1:30 – 3:05	**Contributed Paper Sessions**; rooms 2101B, 2110, 2111, 2113, and 2115
3:00 – 3:30	**Intermission and Refreshments**; Reception Area (Silent auction bidding ends at 3:30)
3:35 – 4:25	**Unsolved (and Solved) Problems From The On-Line Encyclopedia of Integer Sequences,** *Neil J. A. Sloane, Rutgers and the OEIS Foundation.* Presider: David Nacin, William Paterson University; Siegler Hall
4:30 – 5:00	**Prizes and Awards**; Door prizes and silent auction winners (must be present to win); Siegler Hall
5:30	**Dinner Honoring Speakers, Spanish Pavillion,** 31 Harrison Ave., Harrison, NJ 07029

Abstracts and Biographies of Speakers

Group Locomotion in Fluids

Jun Zhang
NYU Courant Institute of Mathematical Sciences

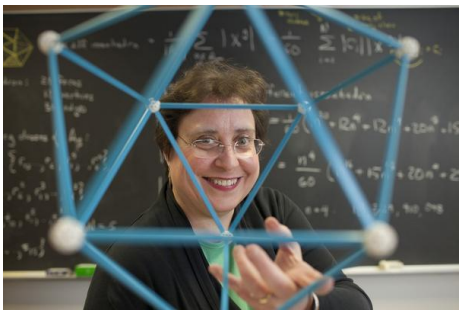
Understanding how animals move is very important to us as we try to comprehend the animal kingdom and be inspired by their strategies when moving about. Subject to physical laws, animal locomotion gaits may look vastly diverse across many species but most of them do share some very common features. For example, birds flap their wings in the air and fish flap caudal fins (tail) in water. Such flapping motions and their interaction with the surrounding fluids has been a central problem in fluid dynamics. In this talk, I will discuss a few simple experiments as we study how animals move in water and air. Through these studies, the familiar phenomena of animal swimming and flying may offer a few surprises.

Jun Zhang graduated from Wuhan University in China before he earned his Ph.D. in Physics at the University of Copenhagen, Denmark. After a postdoctoral experience in biophysics at Rockefeller University, he came to NYU and started building the Applied Math Lab at the Courant Institute and later he became a faculty member there. His research interest has been in the field of physics of fluids and complex systems, which includes biomechanics or bio-locomotion (organismal swimming and flying, and walking), geophysical fluids (thermal convection, continental dynamics, and erosion), solid-on-solid friction, urban heat-island effect, and self-organization phenomena at many different scales.

Counting Curves: Tales from the Enumerative Crypt

Susan Jane Colley
Department of Mathematics, Oberlin College
Editor of *The American Mathematical Monthly*

We will consider the Steiner problem (1848) of five conics: to determine how many conics are simultaneously tangent to five others. We will review some of the history surrounding this problem and some of the ingredients needed to solve it. Finally, we'll speed ahead to modern times and briefly sketch joint work with Gary Kennedy (Ohio State) and Lars Ernström (Ericsson) that uses mathematical techniques inspired by ideas in theoretical string theory to address some analogous questions about "higher-order" contact of plane curves.



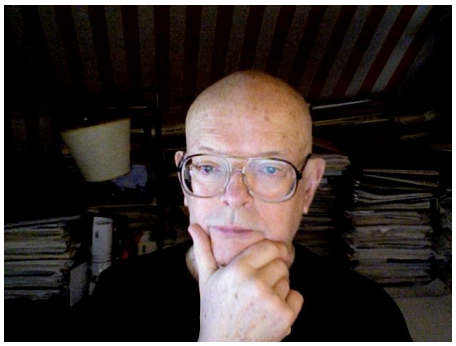
Susan Colley is the Andrew and Pauline Delaney Professor of Mathematics at Oberlin College and currently the Editor of *The American Mathematical Monthly*. She received her B.S. and Ph.D. degrees from MIT in the previous century. Her research interests lie in algebraic geometry and related areas; students may know her from her textbook *Vector Calculus, 4th ed*. (Pearson, 2012) and curse her accordingly.

Unsolved (and Solved) Problems From The On-Line Encyclopedia of Integer Sequences

Neil J. A. Sloane
Rutgers University and The OEIS Foundation

The OEIS contains 320,000 sequences and has been cited by 8000 articles. But every few days a new sequence is submitted which makes one want to drop everything to try to solve it. Here is a collection of recent and not-so-recent examples, mostly still unsolved, arising from algebra, geometry, and number theory. Warning: this talk may cause insomnia.

Neil J. A. Sloane received a Ph.D. degree in Electrical Engineering from Cornell University in 1967 and worked at AT&T Bell Labs until his retirement in 2012. He is an AT&T Fellow and a Fellow of the Learned Society of Wales, the AMS, and the IEEE. He is the author of books on coding theory, sphere packing, optics, integer sequences, orthogonal arrays, and rock climbing. On Google Scholar he has 54,000 citations and an h-index of 81. His recent videos on YouTube have been viewed three million times.



Workshop: Encouraging Creativity in Mathematics: The Rethinking of a General Education Mathematics Course

Presented by Dr. Mika Munakata, Dr. Ashwin Vaidya, and Ceire Monahan, Montclair State University

What is creativity? How is it relevant to undergraduate STEM education? The Creativity in Science and Mathematics project at Montclair State University, funded by the NSF, challenges the common notion that creativity is relegated to the artistic realm. In an effort to challenge traditional, lecture-style instruction and to challenge students' preconceptions about the

nature of science and mathematics, we have developed course modules for undergraduate STEM courses that embrace creative approaches to both traditional and unusual questions. Through these modules, students are challenged to ask questions, test assumptions, and take on non-routine approaches. As part of the project, we collected and analyzed both quantitative and qualitative data from the students and instructors. Results from Year 1 indicate that the course modules and adapted instruction did have an impact on students' understandings about the nature of mathematics and attitudes toward the learning of mathematics.

In this session, we will describe these course modules and the outcomes of the related research and engage participants in some sample activities. Participants will: 1) Learn about a model for incorporating creativity into STEM courses; 2) Hear about significant results from our implementation; 3) Engage with some sample modules; 4) Generate ideas for instructional innovations that encourage students to embrace STEM as creative endeavors; and 5) Consider ways in which they can participate in the program.

Mika Munakata is a professor of Mathematics Education in the Department of Mathematical Sciences at Montclair State University. In addition to this project on creativity in STEM, her research interests include teacher leadership, interdisciplinary STEM teaching and learning, and professional development.

Ashwin Vaidya is an Associate Professor in the department of Mathematical Sciences at Montclair State University. He works on problems at the interface of physics and mathematics, on issues of emergence of patterns in physical systems and is also interested in fostering conditions in the classroom for the emergence of creativity in his students.

Ceire Monahan is a doctoral student and research assistant at Montclair State University. She is a former middle school teacher interested in developing innovative ways to infuse creativity and mathematics to improve student learning along with understanding best practices in preparing and supporting pre- and in-service teachers to teach mathematics.

Abstracts of Contributed Paper Sessions

Organizer: Kathy Turrisi, Centenary University
General Contributed Papers; room 2101B
Presider: Kathy Turrisi, kathy.turrisi@CentenaryUniversity.edu, Centenary University

1:30–1:50: **Obamacare Meets Real Analysis**
Sam Ferguson, sjf370@nyu.edu, New York University
Abstract: Last year, the speaker met an Uber driver who was eligible for assistance in paying for health insurance under the Affordable Care Act, but who couldn't claim it under existing IRS guidance. In this talk, we highlight how theorems and proofs in real analysis revealed flaws

in IRS guidance and allowed those adversely affected to claim assistance using an alternate procedure. We relate the IRS guidance to lessons and concepts we want our students to learn in real analysis courses, such as how to apply one-sided continuity, the role of monotonicity in proving the existence of limits, and proof by bisection. This work was featured in an article and video made available by Money magazine at: http://time.com/money/5237795/irs-tax-problem-obamacare/subsidy/

1:55–2:15: **Using SageMath to Explore the Mathematics of the Lights Out Game**
Boyan Kostadinov, bkostadinov@citytech.cuny.edu, NYC College of Technology, City University of New York
Abstract: In this talk, we use SageMath to explore computationally the mathematics behind the Lights Out game. We offer concrete coding explorations for students to investigate the classical Lights Out game and its variants, from simple exercises to open problems, suitable for student research projects. We provide sample SageMath code for numerical explorations and visualizations of Lights Out, which offers insight and builds intuition for deeper mathematical understanding.

2:20–2:40: **Discriminant of Polynomials**
Yusuf Gurtas, YGurtas@qcc.cuny.edu, Queensborough Community College
Abstract: Discriminant of a quadratic gives us a definitive answer about the nature of its roots. The same is also true for a cubic, even though it's not so easy to calculate it, however after the third degree classical discriminant becomes more and more difficult to calculate and less and less interesting in terms of the information it carries about the nature of the roots. Discriminant of a polynomial of degree n is a homogenous polynomial of degree n of its coefficients and uses all of them. In this session we will talk about a discriminant of degree two that uses only the leading three coefficients of a given polynomial of degree n and the information it carries about the polynomial, in particular about the nature of its roots. We will also mention other discriminants of degree two that are defined using only three consecutive coefficients of the polynomial and point out to some of the information that they carry about the polynomial itself.

2:45–3:05: **Modeling Carcinogenesis by Coloring Graphs**
Josh Hiller, johiller@adelphi.edu, Adelphi University
Abstract: In this talk we will show that a classical model from mathematical oncology is equivalent to a coloring problem on hypergraphs. We explore this new perspective and use it to show several ways in which graph theory can help us formulate biological hypothesis.

Recreational Mathematics; room 2110
Presider: David Nacin, nacind@wpu.edu, William Paterson University

1:30–1:50: **Pascal, Padovan, and Proofs Without Words**
David Nacin, nacind@wpu.edu, William Paterson University
Abstract: What happens if we try to construct the Fibonacci spiral with triangles instead of squares? We get a sequence we call the Padovan numbers. We show how this construction defines this sequence and then find this same sequence hidden again in Pascal's triangle, in a way also similar to that of Fibonacci. We then prove several identities without either words or numbers, by considering colorings corresponding to sums of entries on Pascal's triangle.

1:55–2:15: **The Plastic Ratio, the Monastery at Vaals, and a New Fibonacci Arrival**
David Nacin, nacind@wpu.edu, William Paterson University
Abstract: The golden ratio is famous partly from its simple definition involving the proportions and single rectangle. We introduce a different ratio involving proportions of a square, and use that as an alternate method for defining the Padovan sequence. We then observe uses of this sequence in architecture, and conclude with a natural construction of the Fibonacci numbers in a sequence related to the Padovan numbers.

2:20–2:40: **Breakfree Barrycades**
Brian Hopkins, bhopkins@saintpeters.edu, Saint Peter's University
Abstract: Barry Cipra developed a bricklayer's puzzle where rows of bricks with lengths 1, 2, ..., *n* are ordered to avoid multiple vertical breaks. How many rows can there be? For what *n* has the maximum potential arrangement been found? Richard Guy has named these Breakfree Barrycades. We will survey results from an unpublished manuscript and subsequent work from computer scientists.

2:45–3:05: **Rainbow Barrycades**
Brian Hopkins, bhopkins@saintpeters.edu, Saint Peter's University
Abstract: Using the color coding of Cuisenaire rods, where length 1 bricks are white, length 2 bricks are red, etc., we explore a variant of a puzzle from Barry Cipra. A Rainbow Barrycade has rows of bricks with lengths 1, 2, ..., *n* ordered to avoid repeated colors in any column. How many rows can there be? For what *n* has the maximum potential arrangement been found?

Teaching and Learning Math I; room 2111
Presiders: Farjana Shati, fshati@citytech.cuny.edu; Julia Rivera, jurivera@citytech.cuny.edu; New York City College of Technology, CUNY

1:30–1:50: **Reading Tables and Charts and Extracting Necessary Information to Create a Model of the Problem and Analyze the Model in Differential Equation**
Tanvir Prince, tprince@hostos.cuny.edu, Hostos Community College, CUNY
Abstract: This project is part of the "Numeracy Infusion for College Educator (NICE)" program. Several faculty from different colleges of CUNY were part of this program and we went through professional development on how we can infuse quantitative reasoning in our courses. I was part of this training and in this presentation, I will show some of these QR

outcomes that I infused in my differential equation class. The main QR goal that I wanted to achieve is for the students to be able to read graphs, tables, and charts and to be able to extract the relevant information to create a model of the problem. Students later will be able to analyze the model to answer more questions. The table that I have used is the population, in thousands, of harbor seals in the Wadden Sea over the years 1997 to 2012. Students use the given data to answer some relevant questions. For example, is the data set follow a pattern for logistic growth model? If yes, find the logistic model for the given data set. Students will also be able to calculate error between the given model and the actual data (error analysis). Students were tested (assessed) at the end on three questions to see how well they acquired the knowledge.

1:55–2:15: **Active Learning with Math-Anxious Students: What I Learned Working at the Museum of Sexist Objects**

Anil Venkatesh, avenkatesh@adelphi.edu, Adelphi University

Abstract: How do you use active learning techniques with students who experience math anxiety? The heightened level of engagement in such techniques has been shown to support learning more effectively than lecture-based classes, yet students who already experience math anxiety may find the expectation of classroom engagement further anxiety-inducing. I honed my skills in active learning pedagogy in a surprising place: the Museum of Sexist Objects (MoSO) at Ferris State University. This museum seeks to raise awareness and inspire activism in response to everyday items that promote sexism, gendered violence, and female stereotypes. As a tour facilitator at the museum, I regularly worked with groups of students who displayed clear discomfort with the subject matter and were reluctant to engage in conversation. In this talk, I share some facilitation techniques I developed at the MoSO that helped overcome the initial hesitation to engage with the museum's collection. I then discuss the clear parallels between museum facilitation on sensitive topics and active learning pedagogy with math-anxious students.

2:20–2:40: **The Effect of Peer-Supported Precalculus Workshops on Women, Minorities, and First-Generation College Students**

Farjana Shati, fshati@citytech.cuny.edu, Janet Liou-Mark, jliou-mark@citytech.cuny.edu; New York City College of Technology, CUNY

Abstract: Peer-led collaborative problem-solving sessions are considered to be an effective practice in promoting understanding. The implementation of the Peer-Led Team Learning workshop model in a precalculus course where students work once a week on a set of modules have shown significant differences between responses provided males and females, minority and non-minority students, and first-generation and non-first generation college students. Differences in department final grades and course grades between each group will be discussed.

2:45–3:05: **The Impacts of a Geoscience Research Program on Gender, Ethnicity, and First-Generation Status of Undergraduates Majoring in Mathematics and Engineering**
Julia Rivera, jurivera@citytech.cuny.edu, Janet Liou-Mark, jliou-mark@citytech.cuny.edu, Reginald Blake, rblake@citytech.cuny.edu; New York City College of Technology, CUNY
Abstract: It has long been recognized that research experiences for undergraduates are critical catalysts for attracting, recruiting, and retaining students (particularly underrepresented minority students) in STEM fields. Over a span of five years, a study was conducted at the New York City College of Technology of the City University of New York to examine the impacts a summer National Science Foundation Research Experiences for Undergraduates (NSF REU) program had on gender, ethnicity, and first-generation college students who were mathematics and engineering majors. Over the course of a nine-week program each summer, different cohorts of participants were trained in geoscience research using satellite and ground-based remote sensing data and applications. Survey responses regarding their research experiences were collected and analyzed. These results showed statistically significant gains for underrepresented minority and first-generation college students in their confidence to conduct research, in their ability to communicate science, and in their interest in applying for graduate school. Results further showed that female students enjoyed the research experience more than their male counterparts did. More so than their female peers, male students found the research experience more challenging than they first expected it to be. The study was supported by the NSF REU grant #1560050.

Teaching and Learning Math II; room 2115
Presider: Satyanand Singh, ssingh@citytech.cuny.edu, New York City College of Technology

1:30–1:50: **Challenges and Strategies in a College Math ESL Classroom**
Monica Deni Morales-Hernandez, mmoraleshernandez@adelphi.edu, Adelphi University
Abstract: As mathematicians we'll probably agree when it's said that Mathematics is the universal language; as math instructors, we all have faced challenges that have made us modify and improve our teaching techniques and the way we communicate math to the students. We all have asked at least once of the following question: What should I do to communicate math with students that have limited math experience? Some might have successfully answered this question and some others might still be looking for the answer. Some interesting questions to ask are: How do we communicate math with students that not only have limited math experience but also have limited English skills? How do we modify the math curriculum so that the students can successfully complete the class? In this talk, I will explore challenges and strategies that may be implemented in introductory math classes.

1:55–2:15: **An Enticing Simulation in Ordinary Differential Equations that Predict Tangible Results**

Satyanand Singh, ssingh@citytech.cuny.edu, New York City College of Technology, CUNY

Abstract: In this case study the distance traveled by a mass in an under damped system was simulated with the Maple software. This is an important problem in physical and quantum systems in mathematics and physics. The results touched upon an interaction between calculus and differential equations and illustrate a nice approach for collaboration in small student groups. This case study challenged students to conjecture on solutions, simulate them and prove them theoretically while they derived unexpectedly elegant closed form expressions and generalizations. This approach provided a medium for rich discussions, enhanced student success and retention and propelled some students into graduate programs.

2:20–2:40: **Beyond the Handout: Interactive Activities that Inspire Mathematical Thinking**

Ashley Tasy, atasy@brookdalecc.edu, Brookdale Community College

Abstract: We all know that with anything, practicing helps aid in progress. In the math classroom, it is so easy to fall into the practice of using handouts filled with problems to assess student learning. However, is it always the best method? In this presentation, I will teach you different types of activities that can easily be integrated into your lectures to engage students and develop more critical thinking of concepts.

2:45–3:05: **Improving Student Engagement Through Online Mini-Assessments in Large Lecture Classes**

Sheila Tabanli, sheila.tabanli@rutgers.edu, Rutgers University

Abstract: Assessing students effectively is a vital component of effective teaching and learning. Assessing student learning on a daily basis in large lecture classes becomes a challenge due to limited opportunities for close student-instructor interactions. By creating online mini-assessments in teacher.desmos.com website and incorporating interactive activities to lectures offers immediate feedback to the instructor and to students simultaneously. Although Desmos is a free, online graphing calculator used extensively by students, there is a Desmos component that has not been widely utilized by teachers. The teacher.desmos.com website enables instructors to create class activities easily and freely to assess student learning. These interactive activities have been extensively used in four large lecture freshman Calculus I classes for life sciences majors at Rutgers University-New Brunswick. The instructor is able to identify areas of misconception, common mistakes, and compares the student learning outcomes among the four large lecture sections that she currently teaches. The activities have been designed for anonymous student input and not for grading purposes. In this digital age, students are already accustomed to using cellphones for various daily tasks. Beyond its function as a classroom assessment tool, mobile technology is the primary conduit for some students' learning experiences. It has been observed that students are more inclined to providing online, anonymous feedback rather than offering individual or group feedback

specifically in large lecture classes taught in an auditorium seating. By analyzing the common mistakes as a whole-class on the assigned few problems, this interactive assessment contributes to a more engaging active learning environment.

Student Research Paper Session; room 2113
Presider: Abraham Mantell, Abraham.Mantell@ncc.edu, Nassau Community College, SUNY

1:30–1:45: **Patterns Between the Number of Cevians or Caliians and the Regions that They Form in Polygons**
Calia Kugler, Half Hallow Hills High School East; Advisor: Robert Gerver, Institute of Creative Problem Solving
Abstract: This paper is a description of an investigation into cevians and caliians (cevians in a figure other than a triangle). The formula for the number of regions formed in a triangle by drawing n cevians from each vertex is obtained in several ways. Next, formulas for the number of regions formed in other simple polygons by drawing n caliians are developed. A pattern is observed and a general formula for the number of regions in any polygon is developed. This formula is then generalized to show the number of regions formed in a simple polygon by drawing caliians not only to the opposite side of a vertex but to other sides as well. A Java program is developed to count the number of regions in a triangle and a square formed by any number of cevians or caliians drawn from any vertex, thus not requiring the same number of cevians or caliians from each vertex. Some recommendations for further research include developing formulas for the number of regions in any simple polygon formed by drawing any number of cevians or caliians from any vertex to any side. Additional figures can be considered, including circles and convex polygons. An investigation to extending caliians to complex polygons should be considered as well. An extension to the Java program to include other figures should be developed.

1:46–2:01PM: **A Game-Theoretic Approach to Neural Networks**
Danielle Gruber, Village School (Great Neck, NY)
Abstract: The brain is an intricate system of connected regions, constantly and continuously relaying and integrating information. Connectivity is an essential feature when considering the dynamics of a neural network, as it greatly influences the pathways by which regions communicate and the means by which regions activate. In neuroimaging, connectivity is often defined anatomically, by the biophysical connections that actually exist, and functionally, by the statistical dependencies among regions. Here, a mathematical model based on evolutionary game theory on networks (EGN) is formulated, capturing elements of both anatomical and functional connectivity, and further delineating differences between a brain in resting state and a brain engaged in a specific task. The model, based on the work of Madeo et al., (2017), describes the activations of different regions in the network as functions of time, changing based on interactions with other regions in terms of payoffs for activation and

inactivation. Although theoretical in nature, the model has implications for our understanding of neural network dynamics and the techniques which attempt to capture such dynamics.

2:02–2:17 PM: **Deriving the Armitage and Doll Model of Carcinogenesis**
Gabriella Smokovich, Andrew Velasquez-Berroteran, and Eleni Zamagias, Adelphi University; Advisor: Joshua Hiller
Abstract: The Armitage and Doll model of carcinogenesis is one of the fundamental cornerstones of mathematical oncology. However, this 'model' is not really a model at all but rather a framework that has been modified dozens of times in the literature. In this presentation we will examine how the Armitage and Doll presented and derived their original work with an eye towards explaining why their work has been so widely influential.

2:18–2:33 PM: **An Enticing Study of Prime Numbers of the Shape $x^2 + y^2$**
Xiaona Zhou, New York City College of Technology (CUNY); Advisor: Satyanand Singh
We will study and prove important results on primes of the shape $x^2 + y^2$ using number theoretic techniques. Our analysis involves maps, actions over sets, fixed points and involutions. This presentation is readily accessible to an advanced undergraduate student and lays the groundwork for future studies.

2:34–2:49 PM: **Algorithms for Change Detection in Dynamic Networks**
Neil Hwang, City College (CUNY)
Abstract: The clustering problem has become a popular topic among researchers in fields ranging from mathematics to social sciences. Also known as the community detection or community recovery problem, its popularity is evidenced by many methods available in the literature. Regardless of the method choice, one important input is the number of clusters. I will first review five algorithms and the main underlying theoretical results from recent literature for estimating the number of communities in network data. Then, I will present a novel algorithm that extends the algorithms in the literature to detect structural changes in dynamic networks. The performance of the algorithms is compared using simulations and real-life network data.

2:50–3:05 PM: **Successive Tightening of Pinch Points of Logistic Maps and Fractals**
Harry H. Xi, Princeton University; Advisor: Jonathan Fickenscher
Abstract: We will explore the dynamic stability of the fixed points of the family of logistic maps $g(x) = ax(1 – x)$ for real parameters a. From certain values of a, we will observe that convergence of iterations of the logistic map to those fixed points are non-geometric. For these cases, we will then examine how perturbations of g from the zero function $y = 0$, the positive identity $y = x$, and the negative identity $y = –x$ translate into rates of convergence to fixed points using differential analysis. Because the resulting differential analysis proves so useful, we will explore how such analysis can predict, particularly, the trajectory of the size of the Universe in the future. Moreover, of considerable interest are the logistic functions g

which have initial perturbation from the negative identity $y = -x$. Here, adding higher power perturbations may affect not only the rate of, but also the convergence itself, of iterations to p. In this respect, we will derive a formula to see which power perturbations may affect convergence and which ones cannot. Finally, we will show that the logistic maps are dynamically conjugate up to renormalization, and this renormalization leads into the analysis of the Mandelbrot Set ($z_0=0$, $z_n=z_{n-1}^2 + c$), Julia Sets, Hénon Map objects, and other related fractals.

Lunch Discussion Tables

Organized by Kathy Turrisi, Centenary University. There will be nine discussion tables at lunch:

1. **Doing Experiments in a Math Environment**, led by Jun Zhang, New York University
2. **Publishing in MAA Journals (Especially the Monthly),** led by Susan Jane Colley, Oberlin College
3. **Using AI to Guess Sequences**, led by Neil J. A. Sloane, Rutgers University
4. **Encouraging Creativity in Mathematics**, led by Mika Munakata, Ashwin Vaidya, and Ceire Mondhan, Montclair State University
5. **Topics in Graph Theory**, led by Deepak Bal, Montclair State University
6. **Peer Assisted Learning Mathematics**, led by Julia Rivera and Farjana Shati, NY City College of Technology, CUNY
7. **How to Get More High School Participation with Local MAA Sections**, led by Abraham Mantell, Nassau Community College, SUNY
8. **Retaining Students in Math,** led by Linda Ritchie and Kathy Turrisi, Centenary University; Grace Cook, Bloomfield College
9. **Teaching the First Two Years of College**, led by Jonathan Weisbrod, Rowan College at Burlington County

Those who pre-registered have priority at these discussion tables. We look forward to a set of lively and interesting discussions!

Report on the MathFest 2019 MAA Congress Meeting

By Tom Hagedorn

The MAA Congress met for an all-day meeting in Cincinnati on July 31, 2019, the day before the 2019 MathFest. The meeting began with introductions and a review of the MAA's revised mission and vision statements:

> Mission: The mission of the Mathematical Association of America is to advance the understanding of mathematics and its impact on our world.
>
> Vision: We envision a society that values the power and beauty of mathematics and fully realizes its potential to promote human flourishing

The Congress reviewed the MAA's strategic goals and approved two new goals: (1) To sustain a robust portfolio of programs that expand MAA's outward facing impact; and (2) Hosting the International Mathematical Olympiad competition in July 2021. The Congress then heard reports on the MAA's current operations and programs. Significantly, in 2018, the MAA experienced modest membership growth and had a balanced budget. The Congress was informed about new membership benefits:

a) Access to PRIMUS, Journal of Mathematics and the Arts, and Chance
b) Discounted subscriptions to The Great Courses
c) Access to the MAA Video Library. New to the Video Library this fall will be the 2019 MAA MathFest Speaker Videos

The Congress discussed the ending of the JMM in 2021. As of 2022, all MAA national meeting events will occur at MathFest. The MAA will build on the continued growth of MAA MathFest and will also direct resources to better support MAA Sections at sectional meetings and other programs that expand access and services to more members. Examples include:

- Digital community tools such as MAA Connect
- More support for Section NExT
- Expanded MAA MathFest program
- New Section speaker programs

The meeting concluded with two discussions on i) Ideas for Increased Support for MAA Section Meetings; and ii) how to ensure that all areas of the MAA community are well-represented on the Congress. The next meeting will be at the 2020 MathFest in Philadelphia, Jul. 29-Aug. 1.

MathFest 2019 MAA Section Officers Report

By Tom Hagedorn

The MAA's Section Officer's Meeting was led by Lisa Marano (EPADEL), chair of the MAA Task Force on Sections. The Task Force has been working on a number of ways, both small and large, that the MAA can help support sections. They include:

a) Visitor and Lecture Programs. MAA-NJ has an Editor Lectures Program visitor in 2019-20 and we can host one MAA officer section visitor each year.
b) Communication. This area is considered MAA's greatest unmet need. MAA is unveiling MAA-Connect, a new meeting software platform this fall to enable sections and section leaders to more easily work together.
c) Logistics. MAA is working to provide help with online registration, joint meeting logistics and promoting attendance at sectional meetings.
d) Diversity and Inclusion. The MAA would like to help sections increase diversity and inclusion in section meetings.
e) Developing a Community Beyond Meetings. The MAA would like to strengthen ties with SIGMAAS outside of meetings and have sectional SIGMAA activities.

f) Support to run Section Elections.

Much of the meeting was spent brainstorming among section leaders on how to best utilize the new MAA-Connect software. Officers thought about ways that being able to connect to the larger community of Section Leaders could enhance or improve what we are able to do for our Section.

The Task force also highlighted the many MAA Programs, including the new Tondeur BIG Career Initiative. This program provides financial support for a round of BIG ("Business, Industry, and Government") Career Activities at MAA Section Meetings from Spring 2020-Fall 2021. Proposals are due at MAA about 6 months ahead of time. Officers discussed ways that sections can work collaboratively to create new Tondeur activities which can work within the structure of our existing section program.

The Task Force is also encouraging sections to highlight and celebrate talented people in each section who may not attend national meeting. It has formed a Section Best Practices committee that will be looking to collect a list of best practices by sections on a variety of topics. Karen Stanish, Keene State College, will chair this subcommittee.

Book Sales at the Meeting

There will be 25 Titles on Display at the meeting, including 14 AMS books and 11 MAA books. The discounted meeting price for MAA and AMS members is 40%. The discount for non-members is 25%; discounts, along with free shipping, are valid through November 26. Discounts apply to Titles on Display and most other AMS and MAA books. To place an order, call 1-800-321-4267 or 401-455-4000 and ask for Customer Service. Use code MT262 for your discount. No book orders will be taken at the meeting.

Future Meetings

MAA-NJ. The Spring 2020 MAA-NJ Section meeting will be held at Rowan University on Saturday, April 18, 2020. The Fall 2020 MAA-NJ Section meeting will be held at Kean University on Saturday November 14, 2020.

MAA METRO-NY. The MAA Metropolitan New York Section will hold its next meeting on Sunday May 3, 2020 at Queens College, CUNY.

GSUMC. The 2020 Garden State Undergraduate Mathematics Conference (GSUMC) will be held in conjunction with the Spring Meeting of the NJ Section at Rowan University. The conference will include poster and oral presentation sessions for undergraduate students, as well as a team mathematics-problem competition. There are many opportunities for faculty to participate in co-organizing the conference. Contact one of the co-directors Deepak Bal (deepak.bal@montclair.edu), Lee Collins (collinsn@rowan.edu), or Ik Jae Lee

(leei@rowan.edu) to volunteer. For additional details see the GSUMC web site: http://sections.maa.org/newjersey/GSUMC/GSUMC.htm

National MAA Meeting. The 2020 Joint Mathematics Meeting will be in Denver, January 15–18.

MathFest. The 2020 MathFest will be in Philadelphia, July 29–August 1.

Call for Contributed Papers and Lunch Table Discussion Topics for the Spring 2020 MAA-NJ Meeting

There will be two special contributed paper sessions. All papers will be reviewed by the organizers. Please submit a title, three- to four-sentence abstract, and one-page description in MS Word format by **January 24, 2020** to the session organizer.

1. **Recreational Math.** Organizer: David Nacin, nacind@wpu.edu, William Paterson University
2. **General Contributed Papers**. Organizer: Kathy Turrisi, kathy.turrisi@centenaryuniversity.edu, Centenary University

MAA members interested in leading a Lunch Table Discussion at the Spring 2020 meeting are asked to submit their proposals to Kathy Turrisi, Centenary University, kathy.turrisi@centenaryuniversity.edu by **January 24, 2020.**

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 2020 award. Please consider nominating an inspiring, respected, or influential deserving colleague for this prestigious award. A nominee must have been an MAA member for at least two years prior to the nomination. Nomination information is posted at http://www.maa.org/newjersey. For additional information you may contact Zhixiong Chen (Secretary, MAA-NJ) at zchen@njcu.edu. Nominations are due by **November 20, 2019**.

Social Media Information

A message from social media director Grace Cook, Bloomfield College. Check us out!

Email:	maanj.socialmedia@gmail.com
Facebook:	https://www.facebook.com/maanewjersey
Instagram:	https://instagram.com/maanewjersey
Twitter:	https://twitter.com/maanewjersey

MAA-NJ Committees

Awards Committee: Tom Hagedorn, College of New Jersey (chair); Aihua Li (ex-officio), Montclair State University; Sarita Nemani, Georgian Court University; Jonathan Weisbrod, Rowan College at Burlington County.

Nominating Committee: Zhixion Chen, New Jersey City University; Karen Clark, College of New Jersey; Thomas Hagedorn (chair), College of New Jersey; Aihua LI (ex-officio), Montclair State University; Hieu Nguyen, Rowan University.

Teaching Award Committee: Denis L. Blackmore, New Jersey Institute of Technology; Karen Clark (chair), College of New Jersey; Aihua Li (ex-officio), Montclair State University; Dirck Uptegrove, Nokia.

Contributed Paper Committee (NJ and NY): Grace Cook, Bloomfield College; Aihua Li (ex-officio), Montclair State University; Janet Liou-Mark, New York City College of Technology, CUNY; Abraham Mantell, Nassau Community College, SUNY; Satyanand Singh, New York City College of Technology, CUNY; Kathy Turrisi (chair), Centenary University.

Organizing Committee (NJ and NY): Amanda Beecher, Ramapo College; Zhixiong Chen, New Jersey City University; Grace Cook, Bloomfield College; Thomas Hagedorn, The College of New Jersey; Ik Jae Lee, Rowan University; Aihua Li, Montclair State University; Janet Liou-Mark, New York City College of Technology, CUNY; Abraham Mantell, Nassau Community College, SUNY; Susan Marshall, Monmouth University; Dawn Nelson, Saint Peter's University; Hieu Nguyen, Rowan University; Linda Ritchie, Centenary University; Satyanand Singh, New York City College of Technology, CUNY; Kathy Turrisi, Centenary University; Dirck Uptegrove, Nokia; Elizabeth Uptegrove, Felician University; Paul von Dohlen, William Paterson University; Jonathan Weisbrod, Rowan College at Burlington County; Chung Wong, County College of Morris.

History Committee: Grace Cook, Bloomfield College; Thomas Hagedorn, College of New Jersey; Aihua Li (ex-officio), Montclair State University; Hieu Nguyen (chair), Rowan University.

Hosting Committee: Denis Blackmore, New Jersey Institute of Technology; Li Guo, Rutgers Newark; Chengwen Wang (chair), Essex County College; Mamta Vyas, Essex County College.

Dinner Honoring the Invited Speakers. The Section will honor the invited speakers at dinner at Spanish Pavillion**,** 31 Harrison Ave., Harrison, NJ, following the meeting. Everyone is cordially invited.

Acknowledgments. We thank the Department of Mathematics at Essex County College for their kind hospitality in hosting the meeting. And thanks to the Essex County College Math Club student volunteers for assisting at the meeting.

We thank Jacqueline Bakal (Felician University), Cengage, and Princeton University Press for their generous donations for silent auction and door prizes.

NJAMTE Call for Papers. The New Jersey Association of Mathematics Teacher Educators invites contributed papers (15- to 25-minute talk plus 10- to 15-minute discussion) at its annual meeting scheduled for June 5, 2020 at The College of New Jersey. The theme is: *How teacher preparation programs can prepare future teachers of mathematics to develop rich understandings of the content they will teach and to support the professional disposition to become lifelong learners of that content*. However, any talk about research results, professional development, or issues of concern to mathematics teacher educators will be considered. Proposals should be sent to NJAMTE President James E. R. Beyers at beyers@tcnj.edu by **February 8, 2020.** For further details, contact James Beyers.

Announcement. A lactation room is available at this meeting. Signage directs those who need it to the room.

Join the MAA! http://www.maa.org/membership/join_main.html

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