

THE SEAWAY CURRENT

Newsletter of the Seaway Section of the Mathematical Association of America

FALL 2019
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THE SEAWAY CURRENT

The Seaway Current is published at least twice per year by the **Seaway Section** of the **Mathematical Association of America** (MAA) for the benefit of its members. Its pages are open to all members of the MAA and, by invitation to others, for the exchange of information and opinion. Contributed announcements, articles, and editorials are welcome and should be sent to the editor.

Material may be submitted to the editor by e-mail. Opinions expressed in this newsletter are those of the editor or of individual contributors and do not necessarily represent the views of the MAA or of the Seaway Section.

Editor

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A YEAR CELEBRATING OUR DIVERSITY



AND THE DIVERSITY WE CAN ACHIEVE TOGETHER

We've got wonderful people in our section and, if I say so myself, we do a fabulous job putting together meetings! This year, we're going to celebrate the diversity that we have in our own membership and start a few conversations about how we can include more diverse people in our profession and community in the future. Some questions that we can ask ourselves and one another:

- What can we do to buoy the spirits of young folks, to help them believe in their own math potential?
- What can we do to encourage more women and people of color to continue on in mathematics, stay the course through graduate school and leap into the ranks of academia?
- How can we support and welcome members with physical limitations?
- How can we best welcome and support our own members who feel unheard at department meetings or section meetings, or feel undervalued by their university?
- How can we encourage more of the general population to think about mathematics *for fun*?

I can't answer these questions but, maybe together WE can! Let's brainstorm! Talk to a Seaway Section leader and **get involved!**

Love, the Editor

Ithaca College will host the FALL 2019 meeting, Nov. 1-2, 2019.

We're thrilled to be at Ithaca College – “a community of teachers, learners, and scholars” (**Ithaca College Mathematics Department**) – for our fall meeting and we hope you can join us for the mathematical delights in store. *Thank you, locals Emilie Weisner and Dave Brown, for your hard work organizing and thank you, Ithaca College, for hosting us!*

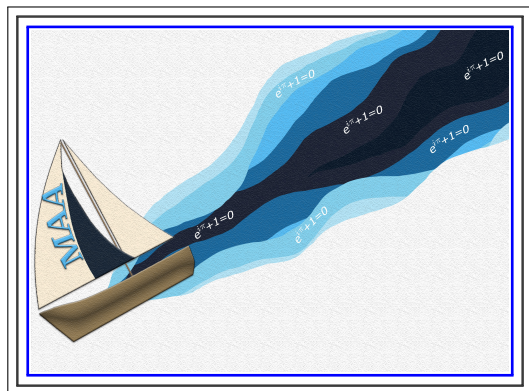
FALL 2019: THE INVITED SPEAKERS

Friday Banquet Speaker:
*From the Banquet Table to
Musical and Mathematical Spaces*
Timothy Johnson, Ithaca College



Abstract: We will use our seats at the banquet table to model musical scales, chords, and patterns based on mathematical properties. Some fundamental principles of basic music theory may be illuminated by means of a mathematical approach that begins with geometrical representations of musical constructs, for which a banquet table serves as an apt model. Familiar and less common scales, all basic triads and seventh chords, and even the distinctive arrangement of the white and black keys on the piano may be derived from mathematical properties that govern musical relationships, all of which can be observed from your seat at the table. Drawing on research in mathematical music theory, we will explore mathematical principles behind certain aspects of the diatonic (for example, the C major scale) and other collections. If time remains and we still have an appetite, we will attempt to construct a proof and explore some novel ways to organize musical space.

TIMOTHY A. JOHNSON is Professor of Music Theory at Ithaca College and Chair of the Department of Music Theory, History, and Composition. His scholarship on mathematical music theory is pedagogically oriented, and includes a textbook, *Foundations of Diatonic Theory: A Mathematically Based Approach*, and several book chapters and presentations. He also has published two other books that combine music and outside fields – *John Adams's Nixon in China: Musical Analysis, Historical and Political Perspectives*, and *Baseball and the Music of Charles Ives*. His other recent work includes an analysis of Caroline Shaw's *Partita for 8 Voices* from a visual arts perspective and an approach to teaching "The Music of *Hamilton* and its Historical, Cultural, Social, and Political Contexts."



**On pennies, McNuggets, polynomials
and how to help the
government save money**
Ricardo Conceição, Gettysburg College



Abstract:

In the 80's, McDonald's restaurants used to sell boxes containing 6, 9 or 20 chicken McNuggets. It was impossible to purchase exactly four or ten nuggets. What other exact numbers of nuggets were impossible to buy? The solution to this question is related to a classical problem in the frontier of number theory and discrete mathematics known as the Diophantine Frobenius Problem.

In this talk we discuss how this famous problem connects the apparently random string of words in the title. Along the way, we will learn about some of its history, applications and generalizations. As an example, we show that it can be used to help the American government not only save \$52.9 million yearly but also turn a modest profit.

RICARDO CONCEIÇÃO is an assistant professor of mathematics at Gettysburg College in Gettysburg, PA. He received his Ph.D. from the University of Texas at Austin under the supervision of José Felipe Voloch, and he has a Masters Degree in Mathematics from Universidade Federal de Pernambuco. He is originally from Feira de Santana, Ba, Brazil, where he received a B.A. in Math Education from Universidade Estadual de Feira de Santana. He enjoys thinking about all things number theoretic, especially if they are related to the theory of elliptic curves and the arithmetic of function fields. His hobbies are: video games, guitar, playing Catan and other board games with his kids, and playing soccer. He still hopes that he will make the Brazilian national soccer team one day, possibly in his next incarnation.

Thank you to Ahmad Almomani, faculty member at SUNY Geneseo, for creating our beautiful new Seaway Section logo!

You can learn more about [Dr. Almomani](#) and his inspiration for the new logo on page 8. Due to the spring photo contest, our new logo has been all over Facebook and soon will be all over our members, with logo-emblazoned t-shirts and tote bags available at the fall meeting. Maybe magnets and stickers with we're lucky!

Navigating Whitewater: Preparing our students for unknown challenges

Alison Gibbs, University of Toronto – Gehman Lecture



Abstract: A world of changing technology, accelerating complexity, and disruptive innovations presents a challenge for how to prepare our students for lifelong success. In addition to an extensive base of knowledge and problem-solving strategies, our graduates need the ability to apply, adjust, and extend what they know in new environments and to new problems. These adaptive experts will be flexible, innovative, and continual learners, able to function effectively as the nature of their jobs and the way they work change. I will discuss the development of learners who are able to thrive in an unpredictable world, and pedagogical approaches to cultivate the development of adaptive expertise. I'll illustrate with some stories of learning experiences from an introductory data science course.

ALISON GIBBS is a Professor, Teaching Stream in the Department of Statistical Sciences at the University of Toronto. She completed a BMath in Applied Mathematics at the University of Waterloo and a BEd at the University of Western Ontario. She taught secondary school mathematics before pursuing graduate studies in statistics at the University of Toronto, completing an MSc and a PhD. She held Post-Doctoral and Assistant Professor positions at York University, before returning to the University of Toronto as a faculty member in 2002.

Alison's research interests range from theoretical properties of statistical algorithms to how students learn. Her publications include studies of convergence rates of Markov Chain Monte Carlo algorithms, collaborative work investigating issues in human health, explorations of how secondary school students reason about Big Data, and examinations of how students most effectively engage with online learning resources. She teaches probability and statistics to students at all levels and in a variety of formats including small seminar classes, large lectures, and a Massive Open Online Course with over 60,000 students.

Alison received the Faculty of Arts and Science Outstanding Teaching Award in 2012, the University of Toronto President's Teaching Award in 2016, and a 3M National Teaching Fellowship in 2018.

Mi Camino - Transforming Collegiate Teaching of Mathematics - Con Compasión

Hortensia Soto, University of Northern Colorado

Abstract:

Few collegiate mathematics faculty receive pedagogical training in the teaching and learning of mathematics as part of their graduate school experience. The need to improve retention in STEM fields, the call to better meet the needs of our under-represented students, and the fact that research indicates that student-centered learning benefits all students gave rise to my role in facilitating professional development as part of the *PROMESAS-SSC* project (US Department of Education, Title III, HSI STEM Grant #P031C160017). As part of this project, I engage the project fellows in rich tasks via student-centered learning that promotes a sense of community with an eye towards equity. In this presentation, I will describe this five-year project, engage the audience in some of the PD activities, and share ways in which the participants expressed their transformation. In addition, I propose that addressing equity in our classroom requires that we as faculty be exposed to both theoretical and practical work that can transform our teaching and our students' learning. Finally, I will advocate that creating a sense of community through compassion is the key to equitable teaching.



HORTENSIA SOTO is a professor of mathematics at the University of Northern Colorado. She has published in various areas of mathematics education including assessment, mathematical preparation of elementary teachers, outreach efforts for high school girls, and especially in the area of teaching and learning of undergraduate mathematics. Her current research efforts are dedicated to investigating the teaching and learning complex analysis, where she adopts an embodied cognition perspective. Since her days as an undergraduate student, Hortensia has mentored young women and promoted mathematics via summer outreach programs. She has also been involved with facilitating professional development for K-16 teachers in Nebraska, Colorado, and California. She has also taught teachers from rural Nebraska as part of the University of Nebraska-Lincoln NSF-funded project, *Math in the Middle*. Currently, she is delivering professional development to collegiate teachers as part of *Project PROMESAS SSC* (Pathways with Regional Outreach and Mathematics Excellence for Student Achievement in STEM). Hortensia is a working member of the Mathematical Association of America; she currently serves as the Associate Secretary and served as the lead editor of the *MAA Instructional Practices Guide*. She is also the coordinator for SIGMAA RUME. More importantly she is Miguel's proud mom!

FALL 2019: SPECIAL EVENTS

FRIDAY

Friday Workshop: “Beyond $p < 0.05$: what should we teach about hypothesis testing?”

Facilitated by: Alison Gibbs (University of Toronto)

2:00 pm - 5:00 pm in Friends 309, Ithaca College

Registration fee: \$10

Abstract: The realization that many scientific studies cannot be replicated has led to calls to retire statistical significance and a ban on P -values. For many years, our Statistics classrooms have too often incorporated a procedural approach to hypothesis testing, perhaps enhanced with some caveats about what P -values are not and what we should not do. But greater consideration of the development of broader statistical thinking, including how we ask questions, design studies, and collect data, may result in better practice and better understanding of what we can conclude from scientific studies. In this workshop we will discuss how we can engage students in considerations of the scientific and statistical issues that lead to appropriate conclusions and a deeper understanding of what P -values are, starting in students' first course in Statistics. We will work through some classroom-ready examples that illustrate problems with reproducibility, discuss possible reasons, and explore simulations to develop a deeper understanding of statistical testing, including the implications of small samples and p -hacking. *All faculty members are welcome to attend. Participants are invited to bring a computer for some hands-on work.*

Math Game Night

Hosted by: Ryan Gantner (St. John Fisher College)

Friday night, following the banquet speaker, in Emerson Suites, Campus Center, Ithaca College

Description: Ryan Gantner (St. John Fisher College) and the Student Program Committee will host an exciting night of games, including a round of trivia and a Pictionary tournament. All are welcome, with undergraduate students especially encouraged to participate. There will be camaraderie, mathematics, and prizes – stick around after the banquet!

SATURDAY

Workshop on Inquiry-Based Learning (IBL)

Organizers: Jane R. Cushman (Buffalo State College), Keiko Dow (D'Youville College),

C. Yousuf George (Nazareth College), Rich Spindler (SUNY Plattsburgh), Matthew Thomas (Ithaca College),

Christine Uhl (St. Bonaventure University), Xiao Xiao (Utica College)

11:15 am - 12:10 pm in 309 Williams Hall, Ithaca College

In this discussion session, we will first have several professors briefly share their in-class activities and student-centered discovery approaches in topics of Pre-Calculus, Calculus, Linear Algebra, and Geometry. Professors will share their experiences, benefits, and challenges of using active learning in their classroom such as time management, students' participation, increasing the depth of mathematical understanding, communication skills, and more. This will be followed by a discussion which is open to anyone who is interested in incorporating active learning strategies in their classrooms. Contact persons: Jane Cushman and Keiko Dow.

Special Session on Research in Undergraduate Mathematics Education (RUME)

Organizers: Sarah Hansuch (SUNY Oswego) & Aaron Weinberg (Ithaca College)

1:30 pm - 3:30 pm in 302 Williams Hall, Ithaca College

Presentations include rigorous and scientific studies about students' mathematical cognition and reasoning, studies of teaching practice in inquiry-oriented mathematics classrooms, and design of research-based curricular materials. Presentations build on the existing literature in mathematics education and use established or innovative methodologies as they pertain to the study of undergraduate mathematics education. This special session is co-sponsored by the MAA SIGMAA-RUME.

Workshop on Leadership in the Mathematical Sciences

Facilitated by: Mihail Barbosu (Rochester Institute of Technology)

Topic: Department Chairpersons as Leaders and Administrators

1:30 pm - 2:25 pm in 309 Williams Hall, Ithaca College

Every semester Mihail Barbosu leads a workshop on effective leadership in the mathematical community. The latest workshop focuses on developing leadership skills and roles for chairpersons. Recent chairpersons, former chairpersons, and especially anyone who has considered the path to becoming a department chair are all welcome to participate!

Listening Session with the Chair

Facilitated by: Cheryl Chute Miller (SUNY Potsdam)

2:30 pm - 3:25 pm in 309 Williams Hall, Ithaca College

Sit down with the Chair of the Seaway Section to discuss initiatives for the future. Do you have suggestions for future meetings? Any requests for workshops, mini-courses, or other fun events? Suggestions or thoughts about charity fundraisers? Do you want to get involved with the section? Maybe you just want to talk about mathematics? Our section chair, Dr. Cheryl Miller (SUNY Potsdam), is ready to listen!

Celebrating Diversity in the History of Mathematics [Poster Session] Spring 2020 Seaway Section Meeting

Organized by Keith Jones (SUNY Oneonta), Toke Knudsen (SUNY Oneonta), and Zoë Misiewicz (SUNY Oswego)



Children arranging a miniature eagle altar used in India's ancient rituals (Kerala, April 2011). Photo by Michio Yano. Used with permission.

The 2020 Spring Seaway Meeting is hosting a poster session! All meeting participants are invited to present a poster on a person, place, practice, or group in the history of mathematics; posters highlighting contributions from underrepresented groups in the history of mathematics are especially encouraged. Undergraduate presenters may opt to enter their posters in a judged competition, and prizes will be awarded to the top undergraduate posters.

Get your students and colleagues involved! Submit a poster yourself!

Reports from Meetings Around the Mathematical Community

Contributed by Gordon Craig, York Univeristy

AMS Eastern Sectional Meeting in Hartford, Connecticut

April 13-14, 2019

I attended my first AMS meeting in over a decade in April in Hartford. My weekend was marred by Hartford's extremely uneven sidewalks, on which I tripped and cut my lip, and a storm which delayed my flight home for over 24 hours, but the conference itself was very enjoyable. As is always the case with AMS sectional meetings, aside from several plenary lectures, most of the action was in the special sessions. The reason I attended this meeting, other than that I had professional development funds that would dissipate if I didn't use them, was that two of the special sessions were right up my alley: a session on recent developments in geometric analysis and nonlinear PDEs, organized by Ovidiu Munteanu, Lihan Wang and Ling Xiao, all of the University of Connecticut, and a session on the convergence of Riemannian manifolds, organized by Lan-Hsuan Huang and Maree Jaramillo, both of the University of Connecticut, and Christina Sormani of Lehman College and the CUNY Graduate Center. In both special sessions, the organizers made a real effort to welcome everyone, even the few people who weren't presenting anything (including me), which was very nice of them. The plenary talks were all excellent, and at an appropriate level for a general mathematical audience. Olivier Bernardi of Brandeis University lectured on "Percolation on Triangulations, and a Bijective Path to Liouville Quantum Gravity", Brian C. Hall, of Notre Dame, spoke about "Eigenvalues of Random Matrices in the General Linear Group in the Large-N Limit" and Christina Sormani spoke on "Compactness Theorems for Sequences of Riemannian Manifolds."

OCMA Meeting in Orillia, Ontario

May 22-24, 2019

The Ontario Colleges Mathematical Association held its 39th annual meeting from May 22nd to 24th at the Ferns resort in Orillia, in the middle of cottage country, about an hour and a half north of Toronto. The meeting has been held at the same place for quite a long time, as the location is comparatively accessible for teachers from all of Ontario's 24 Colleges of Applied Arts and Technology. The Ferns is a very pleasant traditional resort, located on an arm of Lake Simcoe, with a lot of activities, from boating and archery to billiards and video games. This year's theme was "The Big Top Rises for the Greatest Math Show", and there was a heavy focus on building student engagement. There were two keynote speaker, the first of whom was Ron Lancaster of the Ontario Institute for Studies in Education, who gave a very entertaining talk on "Mathematical Moments That Leave us Breathless and Wanting More." This talk included an example of a card-shuffling trick that I'm planning on using to teach functional composition in a future precalculus class. Unfortunately, I missed the other keynote talk, by Amy Lin of Seneca College, "Be More Unicorn: Using your Inner Sparkle for Teaching Math".

It was my first time at the OCMA conference, and I had good time and met a lot of interesting colleagues. I was a bit surprised by the level of involvement of textbook publishers; many of the talks were presented by their representatives, and they hosted a large number of hospitality events over the three days of the conference, during which we were plied with free food and drink. Other than the talks by the publishers, there were several interesting talks in the special sessions. Of these, I particularly enjoyed the presentation by Xinli Wang, of the University of Toronto, Mississauga, on the use of Geogebra in a first-year Linear Algebra class, and a presentation by guests coming all the way from the Southern Alberta Institute of Technology, Lisa Mackay and Paul Obour, who spoke about their experiences overhauling a business statistics course. (Readers might remember Wang from the Seaway Meeting at UTM in the fall of 2018, during which she gave a presentation with Parker Glyn-Adey on soliciting student feedback in large classes.)

Seaway Section takes on social media!

A note from Christine Uhl, Public Information Officer

The Seaway Section of the MAA has a Facebook group! Check out [#SeawayMAA](#) and join the group to get updates on all things Seaway and share updates, too.

In our future is Instagram and Twitter! Public Information Officer Christine Uhl will be sharing tweets and photos during the Friday evening banquet using the hashtag [#SeawayMAA](#). Your tweets and photos can be posted, too, if you make sure to use this hashtag (note that your Twitter profile needs to be public for your tweet to be posted).

Congrats to Florence LaPlaca from SUNY Fredonia, the randomly chosen winner! Florence will be receiving a snazzy Seaway Section t-shirt at the upcoming meeting. We had 6 qualifying entries ...let's see if we can increase that in the fall photo contest. Start planning your photo ops now!



A Note from the Section Chair

SECTION NOTES

FALL 2019

State University of New York at Fredonia:

The Fredonia Department of Mathematical Sciences is piloting a calculus support system to help students review and practice background skills crucial for success in calculus. The online Calculus Support Course utilizes items from multiple question banks of Open SUNY's Lumen OHM. A team at SUNY Oneonta designed the five core modules for the OHM and graciously provided permission and support for using them. Senior Lecturer Kim Conti created a local user interface on the campus learning management system. The course allows students to take pretests to assess areas of strength and weakness and provides targeted practice by topic. A Calculus Support Room hosted by graduate student Dillon Casto is open six hours per week. The service is currently available to students in all Calculus I sections, with participation optional. *(Submitted by Jonathan Cox)*

SUNY Oswego:

We are delighted to welcome David Cossio-Ruiz, Amy Hannahan, Michael Hurley, Joanna McKinney, Zoë Misiewicz, and Jeffrey Slye to our department as full-time faculty members. Ahead of the main influx of new energy, we bid farewell and happy retirement to Christopher Baltus (who joined the department in 1986), Susan Fettes (a member of the department since 1985), and Linda LeFevre (with the department since 1997). *(Submitted by Scott Preston)*

SUNY Plattsburgh:

The SUNY Plattsburgh Mathematics Department announces a new hire, Naveen Somasunderam, who just obtained his Ph.D. from Oregon State University in Corvallis (on the subject of p -adic integers). Additionally, Professor Sam Northshield is on sabbatical leave for the 2019-2020 academic year. *(Submitted by Sam Northshield)*

I am excited to begin as Chair of the MAA Seaway Section during our year of diversity. The idea of a themed year began with a suggestion by Keiko Dow, current Chair of the Student Program Committee, for a special diversity speaker, then Elizabeth Wilcox jumped in with the “why stop there” and soon we were all talking about a themed year. Under the leadership of Jonathan Cox, our past chair, the planning started full force, and now the year is about to begin. With all of the support I will be getting from the Executive Committee, especially Elizabeth Wilcox organizing us as Program Chair, and Jeff Johannes with his skill in finding us interesting speakers, I look forward to a variety of events where we can explore and discuss diversity in mathematics, and within our section. I am already looking forward to our closing keynote for the fall meeting by Dr. Hortensia Soto!



While thinking of diversity in our section, I remembered a recent experience I had. As I helped prepare for a reunion weekend event at SUNY Potsdam, where we would celebrate the 100th birthday of Clarence Stephens, I was thrilled to discover what a long history my own mathematics department has with faculty from diverse backgrounds. I spent a few weeks searching through yearbooks from 1968 to 2016, tracing the faculty of the department to make slides identifying them all. Including Clarence Stephens himself, I discovered that every year there was diversity in the mathematics faculty with both women and minorities represented. We continue this legacy today as the faculty of the mathematics department is more than 50% women, an incredible fact when you consider the difficult fight women had to finally be accepted into academic positions over the last 60 years. I expect many of your departments also have a similar rich history, and I encourage you to explore it and be proud of yourselves!

I want to thank Jonathan Cox for his constant hard work for the Seaway Section, especially on the Bylaws Revisions that were finally approved by the national MAA in 2018. If we learned anything from that long process, it included how much we all have in common, and how well we work together. I know I will continue to rely on his advice throughout this year as I learn to be chair.

As faculty at SUNY Potsdam, I have been part of the Seaway Section for over 30 years, so I know many of you, but if we have never met please come to at least one of our meetings and introduce yourself. Also contact me (millercc@potsdam.edu) if you are interested in serving on one of the committees that help keep the section running smoothly. Our fall meeting begins November 1, 2019, in Ithaca, and I look forward to seeing all of you there.

About our new logo

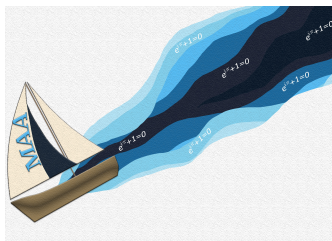
Olympia Nicodemi, SUNY Geneseo

In 1955 the members of the Upper New York State section of the MAA noticed that the section included most of Ontario and all of Quebec. It went right up to the Arctic Circle and it needed a new name. But it took until 1971 for the section become the Seaway Section. The name refers to the St. Lawrence Seaway, a joint Canadian/ American endeavor that speaks to the coordination, cooperation, and common goals of the two regions and nations that it serves. (Details are from Paul Shaefer's *History of the section (1965-1990)*, available on the [Seaway Section website](#).)

Fast forward 46 years. In the fall of 2018, the Seaway Section decided it should have its own logo and staged a competition to do so. Dr. Ahmad Almomani, currently an assistant professor at SUNY Geneseo, submitted his design on Feb. 15, 2019, 7 minutes before the deadline. (It took a while before he realized that the competition was open to faculty, not just students.) His winning logo debuted at the spring 2019 sectional meeting, held at St. John Fisher College in Rochester. Ahmad explained briefly,

"The boat represents the MAA (Mathematical Association of America), and the sea represents all science. In our sailing expedition as mathematicians seeking the unknown, we always end up leaving a beautiful impression like the Euler equation."

In May, 2019 I chatted with Ahmad to get a bit more of the back story of the design. First I asked him to describe the logo in more detail for me. (Take another look before you read on.) Ahmad indicated that the waters did not just represent the St. Lawrence Seaway, a waterway that is confined to its banks, but a sea with no boundaries because mathematics is itself



is vast and boundless. The colors of the water range from a very dark blue to light blue, the dark representing the deepest most profound aspects of our discipline and the light representing a level at which all can participate in and enjoy the mathematics. The MAA is a boat which takes us all– from student to professor–on the journey together. On the way, in that boat and on the sea, we can all find beauty. To Ahmad, the little Euler Equation bopping on the waves distills that beauty.

I then asked Ahmad how his ideas about the mathematics and the Seaway Section turned into art. Part 1 of his explanation was technical. I learned that the image was created in Adobe Illustrator which uses vector graphics. Rather than pixels, vector graphics uses mathematical objects such as lines, polygons, and Bezier curves to store image information. As such, the images are totally scalable. We can print our logo as little image in a corner of a paper or as very big poster and not loose resolution. (There must be a metaphor here somewhere.) In Part 2 of his answer, I learned that Lamya, Mrs. Almomani, is a graphics artist. She helped render Ahmad's ideas onto paper and screen. Thank you, Lamya!

Continued on page 9.

SECTION NOTES CONTINUED

SUNY Potsdam:

Dr. Joel Foisy received the Chancellor's Award for Excellence in Scholarship and Creative Activities in Spring 2019.

Dr. Kerrith Chapman, who retired from the Mathematics Department in 2013, passed away on May 19, 2019. His wife Alison, a long time instructor of the Mathematics Department who also retired in 2013, was by his side.

SUNY Potsdam dedicated a tree to Dr. Charlie Smith, who retired in 1995, outside of his Mathematics Department office. His family was there for the ceremony to unveil the memorial plaque. (Submitted by Cheryl Chute Miller)



As we chatted on, I learned what the Seaway section means to Ahmad. For him, as for so many of us, it is a place to connect with like-minded colleagues who engage in lively conversations that produce new ways of learning, teaching, and creating mathematics. To quote, “I learn things!” For instance, a teaching workshop led by J. Petrillo of Alfred University, has inspired Ahmad to try a flipped classroom. He knows he will have support from the section members. He hopes that his logo will help encourage new faculty to come on board the Seaway Section boat to engage and benefit from it as he has.

Ahmad Almomani himself is a perfect example of what the Section stands for. His mathematical roots are in the Seaway region. Before coming to SUNY Geneseo, Ahmad received his PhD from Clarkson University and has taught there and at SUNY Potsdam, both near the St. Lawrence River Valley. As a teacher, he is devoted to serving his students with interesting, engaging, and challenging mathematics that is insistently fun. He is an active researcher who invites students to join him in his joy of discovery. He supports his students tirelessly. Dr. Almomani and his winning logo clearly reflect what the Seaway stands for.

Special thanks go out!

Thank you to all of the folks who volunteered to moderate contributed and student sessions at the Spring 2019 meeting at St. John Fisher College!

Thank you, also, to all of the volunteer representatives from Business, Industry, and Government (BIG). Students from across our section were able to learn about careers involving mathematics, all because YOU came and made the meeting a “BIG” deal! Volunteers included:

- Abigail Dunn, BPAS
- Bonita Graham, Columbian Financial
- Jonathan Hoyle, Software Engineering Institute
- Ben Husband, SIGMA Marketing Insights
- Julia Martin, Lockheed Martin
- Charles Mclauchlin, Gallagher Benefit Services
- Max Robertson, Lockheed Martin
- Kyle Stich, AFP Analytics

Thank you so much for volunteering your time!!

REPORTS & MINUTES SINCE SPRING 2019

1. TREASURER’S REPORT – FALL 2019 Gary Towsley, Seaway Section Treasurer

Balance as of 3/15/2019		\$17,540.80
SPRING Spring Meeting at St. John Fisher College		
Meeting Receipts - Meeting Expenses	(\$193.91)	
Speaker Expenses	(\$898.91)	
Net		(\$1092.2)
Balance as of 9/12/2019		\$16,448.60

2. REPORT FROM THE CHAIR OF THE SECTION – FALL 2019 Cheryl Chute Miller, Section Chair

Our year of Diversity is underway! Thanks to those who have worked very hard to make this happen, I know we will all enjoy the results.

We are finally on the way toward a website for the section, where registration and online payments can be made for

any meeting, thanks to the hard work of Ryan Gantner and the Website and Registration Committee. I hope you took advantage of the registration form for this meeting and even maybe even tried the online payment. We want feedback and suggestions to keep improving things!

This also brings up a discussion of the advantages and disadvantages of using the MAA service to host our section website. Out of curiosity, I looked at the list of sections for the MAA and of the 29 sections listed, we are one of only 2 who are not using their service.

The new logo has spurred great excitement for items to purchase, starting first with T-shirts and tote bags. Hopefully people will eventually be able to order items and pay for them online through the same system as meeting registrations. We want ideas of items especially from students!

I am very proud of the continual strong participation this section has in meetings. It is clear that not all sections are as lucky to have such a dedicated membership. It is especially encouraging to see large numbers of students giving talks or presenting posters. We have been working to encourage various groups attend meetings, this fall high school teachers will be able to receive professional development credits for attending! Hopefully we can make this a permanent feature or at least to occur regularly.

Speaking of strong participation, new committee terms will begin after the spring meeting, so this is the a perfect time for anyone who wants to get involved to let me know! I will be asking some of you eventually, but I would be thrilled to get volunteers!

Have a great meeting!

Respectfully submitted,

Cheryl Chute Miller (State University of New York at Potsdam), Seaway Section Chair

3. REPRESENTATIVE'S REPORT – FALL 2019

Charles B. Ragozzine, Jr., Seaway Section Representative to the MAA Congress

The Congress of the MAA convened at MathFest in Cincinnati on July 31, 2019 for its annual meeting. The day-long meeting consisted of a variety of discussions, activities, and exchange of information.

Some highlights included discussions on the following topics: Being a member of Congress and Micro-Volunteering (1-3 hour commitments providing member engagement), Strategic Goals (curate a robust portfolio of programs and successfully host the 2021 International Mathematical Olympiad), Leadership's Voices, Representatives' Voices, Ask the President, and Including more Voices on MAA Congress. There were opportunities to provide feedback and table activities where representatives brainstormed on ideas for increased support for sections and for things we wish the MAA would consider doing.

There were several announcements from the MAA leadership.

- The creation of an Inclusivity Award going to members in recognition of efforts to make mathematics a more inclusive discipline. Sylvia Bozeman from Spelman College is the first recipient.
- The MAA's investments in TIAA-CREF have outperformed their benchmarks. The 2018 net gain was around \$858,000 versus the projected \$309,000 loss. This was due mainly to the generosity of two bequests. The MAA's total assets are now approximately \$14,000,000.
- MAA membership is showing growth in all areas: individual, department, student, and SIGMAAs. There was growth in 25 of 29 sections. Some new benefits include great courses, an MAA video library, the Math Values Blog, and new publications like PRIMUS and CHANCE. There are new or revised membership categories for transitional students, retired members, lifetime members two-year college faculty, and ancillary (adjunct) instructors.
- The small and medium rooms for MathFest were arranged differently than in the past. There was more of a banquet-style set up, rather than cemetery rows. Activities and themes were taken into account with an "on purpose/with a purpose" approach.
- Student travel funds date back 20 years when the MAA began trying to increase student participation. Back then there were only 12 posters presented and that's grown to 400+ posters in recent years. The travel grants helped so much with growth and the establishment of successful REUs that it has been decided that the grants are no longer necessary as they have achieved their goal.
- The MAA is working on best practice guidelines for programs and departments. Some issues include recruitment

and retention of faculty and the use of required technology.

- There are 3 new SIGMAAs related to: Knowledge, Sports, and Recreational Math. 12 SIGMAAs held sessions at MathFest 2019 and they began holding their own business meetings.
- A group working on national meetings and sections reported that they will entertain invited address recommendations and ideas about how national can be of help to sections.
- MAA publications now has 8 book series and 6 journals. MAA notes is free to members. There were new journals added: PRIMUS, CHANCE, and Math and Art. An overview of the current editor structure was presented.
- The Committee on Committees and Councils works on populating MAA committees (85-90 of the 100+ are active). Most of the work is done now by Zoom so travel to attend meetings is no longer a requirement and should encourage broader participation.
- The Task Force on Governance is reorganizing the 100+ MAA committees. Input regarding restructuring is welcome and provides an example of micro-volunteering.
- IMO 2019: USA tied with China. The MAA had representation there in preparation for the 2021 IMO in Washington D.C.
- The year-round engagement for Congress 2018-2019 had some success. There were Zoom meeting that about 1/3 of Congress attended. The Congress Learning Communities (CLiCs) met mostly in the Fall 2018 with limited effect. Office hours with leadership were held and topics like increasing section participation and being more active in communication within sections were discussed.

There were several reports from MAA representatives on a variety of issues. I reported on our Year of Diversity theme that we are implementing for our 2019-2020 Seaway Section meetings. It was well-received and may be recommended to appear in the Intersection Newsletter.

Michael Pearson reported on the break between the MAA and AMS in hosting JMM. There had been a lot of concern expressed in the way that this had transpired. The word many members used was “blindsided.” Here are some of the details that went into the decision:

- Since 1998, MAA has shared the responsibility of organizing and paying the costs for JMM. The AMS handled contracts and MAA handled the scientific program.
- During that time, student participation has grown significantly and represents the only growth.
- Around 2014, when the current contract end was in sight, the MAA and AMS entered negotiations for a new contract. The MAA wanted to rearrange payments with a goal of breaking even for the fiscal year. Under the last contract, MAA covered \$300,000 and AMS covered \$500,000 for the average JMM. The AMS always shows significant profits due to Math Reviews (around \$2,000,000 a year), whereas the MAA does not. The AMS wanted the financial obligations to remain the same and so the MAA chose to walk away from JMM.
- The MAA is hopeful that this will provide an opportunity to support sections through the money that is being saved. Some ideas include:
 - Sponsoring three kinds of special lectures: Polya, AWM, NAM. Rather than getting one Polya lecture every 5 years, sections would be eligible for one of the above lectures **every year**. Section visits from MAA officers would remain the same.
 - Support for Tondeur BIG Career Initiatives and PIC Math.
 - Hosting a registration system to help sections organize meetings.
 - Providing sections with MAA Connect, a communication management system for sections to contact membership directly.

Respectfully submitted,

Charles B. Ragozzine, Jr. (State University of New York at Oneonta), Seaway Section Representative to the MAA Congress

4. THE EXECUTIVE COMMITTEE MEETING – April 5, 2019

The meeting came to order at 3:04 pm with Jonathon Cox, Cheryl Miller, Steve Kilner, Gary Raduns, Elizabeth Wilcox and Charlie Ragozzine present. Jeff Johannes joined shortly afterward.

Minutes of the October 2018 Executive Committee meeting were approved by consensus.

REPORTS

- The Section Representative, Charlie Raggozine, had nothing new to report since the Congress no longer meets at the Joint Math Meetings. However, he noted his ongoing email exchanges with Michael Pearson regarding e-mail suppression lists, the Association providing a platform for registration and payments for Section meetings,

and the decision of the MAA to withdraw from organizing the Joint Mathematics Meetings.

- As reported in the Seaway Current, treasurer Gary Towsley reports:

Balance as of 9/15/2018	\$16,914.97
SPRING Meeting at Univ. of Toronto Mississauga	\$304.64
MAA Subvention	\$1,079
Distinguished Lecturer Program	(\$910.49)
Prepaid Spring Meeting Registration	\$152.68
Balance as of 2/15/2019	\$17,540.80

Online registration receipts for this meeting total \$3830. Fees to PayPal totaled \$131.70 (3.4%).

- The Section Secretary had no additional report.
- The Two-Year College Representative, Steve Kilner, had no report.
- The Program Chair, Elizabeth Wilcox, reported several items:
 - Seaway NExT is underway, but with far fewer participants than registered.
 - There will be an IBL workshop following the closing plenary address tomorrow.
 - There are numerous “events” at this meeting.
 - The Clarence Stephens Distinguished Teaching Award will be presented this evening.
 - Nineteen students (groups of students) are presenting in the student poster session Saturday.
 - Additional items and details are in the Program Chair’s written report.
- The Chair, Jonathon Cox reported on several items.
 - The winning entry in the logo contest was the design by Ahmad Almomani of SUNY Geneseo. The logo is featured on a selfie-frame to be used in a photo contest at this meeting.
 - The chair will distribute MAA milestone certificates at the banquet for 25 year and 50 year members.
 - Jonathon polled the officers and Jeff Johannes and Charlie Ragozzine were planning to attend MathFest and could represent us at the Section Officers Meeting.
 - Jonathon continues to participate on an MAA Task Force on supporting the sections.
 - * He presented a word cloud of words respondents used to describe the MAA.
 - * He notes that similar issues and questions are emerging from across the Sections.
 - * The MAA has a platform to conduct elections for the Sections.
 - * The top issue identified in the task force has been good timely communication from the Association and help from the Association to facilitate communication from the Sections to membership and among constituencies such as Sections and SIGMAAs.
 - * A final report from the Task Force is forthcoming.
 - The chair notes the following changes to committee chairs:
 - * Dan Visscher will chair the Seaway NExT Advisory Committee.
 - * Gary Towsley will become chair of the Nominations Committee.
 - **On recommendation of the chair, the Executive Council approved the following upcoming meeting dates:**
 - * **November 1-2, 2019 at Ithaca College, and**
 - * **May 1-2, 2020 at University of Waterloo.**
 - **Action on dates for Fall 2020 was postponed due to questions regarding charges at Siena College.**
 - **The Spring 2021 meeting is planned for Saint Bonaventure University.**
 - The Executive Committee discussed alternatives to the current format of the Executive and Extended Executive Committee meetings.
 - There was a question about fees to register only for the Friday evening banquet.
 - There will be a new business item related to Seaway NExT.
- The Chair Elect, Cheryl Miller, had no report but remarked that discussion about a possible meeting at Siena College will occur later.

OLD BUSINESS

- Report from the Committee on Website and Web Registration (See page 13 for details.)
 - Ryan Gantner reported on behalf of the online registration and web site task force that the plan he had developed was apparently not the right way to proceed. The task force continues to look for other platforms but has not yet found one that is attractive (e.g., low cost, multiple users, ease of use). See the written report submitted by the task force for additional detail.
 - After discussion and a withdrawn proposal, **the Executive Committee agreed to add a paragraph to the local organizer’s guidelines to assure that the continental breakfast be included in the registration**

Report from the Committee on Website and Web Registration
Submitted by Ryan Gantner
Written 3/19/19

The registration for the Spring 2019 Seaway meeting at St. John Fisher College is handled using a Google Form, housed in the Seaway Section Google Drive space. The Google Form is linked to from the local conference webpage, hosted by SJFC. The Form is embedded in a Google Site, also stored on the Seaway Drive space. Once registrants submit the form, information is deposited into a Google Sheet. The Sheet is shared with Ryan Gantner's work account so he can easily access the results at any time. The Sheet contains an App Script so that whenever it is updated with a Form Submission, several things are done. The script scrapes the information off the Form, including the e-mail address inputted, to create a registration confirmation. An e-mail is composed and the registration confirmation is attached to the e-mail. The e-mail is sent from seawaysection@gmail.com. The registration confirmation is stored in a folder on the Drive. Also, in a separate folder, a payment receipt is created. There, the items the registrant has elected to register for and their payment amounts are indicated, but the "total payment" box is left blank so that it can be filled in manually after conferring with the billing receipts. A spot is also left for a signature. Receipts will be printed out and stuffed in folders.

After the Form is submitted, the registrant is taken to a confirmation message screen. From there, they can pay by credit card. The PayPal icons are stored on a local SJFC website written by hand by Ryan Gantner. The address for that site is somewhat long, so a tinyurl address was acquired to redirect to that site (tinyurl.com/2019seaway). Once there, registrants could add various components of the conference to their "cart" (banquet, registration, lunch, etc.) before payment.

The process is not wholly successful. There are several known issues that will need to be addressed moving forward.

- **Upon submitting the Form, the "thank you for submitting the form message" is inadequate in several ways.** Google has really messed this up. They have given us a way to customize the message that gets displayed after the Form gets submitted. However, the screen that shows up is in the same relative location as the Form was upon submission. Because the Form is long, this means that a naturally short "thank you" message would be unnaturally scrolled many screens below the end of the message when first appearing. (In other words, if the Form is at y-coordinate -100 upon exit from the page, the "thank you message will begin there, even if there is no content in that page at that coordinate.) To provide a terrible workaround, I forced the "thank you" message to display over and over again so that it would display at various depths. To do this, I needed a character (a dot) in each line. Unfortunately, for some screen sizes the "thank you" message displayed only dots, and it wasn't clear that there was a message at all.
- **There is a link that doesn't (always) work.** In the "thank you" message, I gave the URL for the payment (the tinyurl mentioned above). When displayed in the "thank you" message, this URL looks like a link (it is underlined, it is displayed in blue, and the cursor turns to a little hand upon hovering) but it doesn't act like a link. When one clicks on it (in most browsers), we simply get a blank screen with no way forward or back. Google mentions that there is no support for links in the confirmation message for Form completion. What it does not say, however, is that one cannot put a URL in the message without it fooling people into thinking it is a link and then trapping them on a blank page. Much of the time this ended up being OK because a confirmation e-mail was on its way with the link embedded.
- **Confirmation e-mails did not always arrive.** I received roughly a dozen e-mails contending that the recipients never got the registration confirmation. In one instance I identified an App Script failure as the culprit. In all other instances, I could see that seawaysection@gmail.com successfully sent the e-mail to the recipient. I suspect that the confirmation was tagged as spam and thus filtered and/or deleted.
- **The PayPal icons are housed on a SJFC webpage.** The webpage which holds the Google Form is a Google Site which lives on the Seaway Section Google Drive. I had intended to put the PayPal buttons on another such Google Site as well. However, Google Sites do not allow PayPal buttons on them. So the only way for me to (quickly) put up a payment site was to use an SJFC site. This is problematic for several reasons:
 - I am the only one who has access to this website. If I become unavailable to edit it, the site becomes unchangeable. This issue is one of the main reasons for the formation of this committee.
 - This site is written using (old fashioned, probably not up-to-date) html code. One of the positions for this committee is to make the web products of this section more universally accessible to those with more limited web programming skills so that more people can take a checks-and-balances role in the website. (Although it wouldn't take much to alter this website)

- The site is not responsive to variations in screen size. It is not adaptive to mobile devices, etc.
 - The site is visually unattractive. It makes me nauseated.
- **The self-calculation of payment leaves too much room for error.** There were too many manual fixes in this regard.

Going forward, it has become clear that the following aspects are desired in a web registration process.

1. The position that the web registration process should reside in the domain of the executive committee (or a subcommittee thereof), rather than of the local organizer, has not changed.
2. A web registration should include a form which has the following properties:
 - a. The form should be able to be linked to from a webpage. Whether the webpage is a local webpage from the hosting institution, the current permanent Seaway webpage, a brand new Seaway webpage, or some combination of these, the form should either be something that is a direct link, or can be embedded in a webpage that is itself a direct link.
 - b. The form ideally will have the ability to use logic when asking questions or making calculations. For example, if one checks the "undergraduate student" box, then one is presented with the question of whether to waive the lunch fee (otherwise not). If one checks that box, then the lunch fee becomes \$0 if checked, otherwise it is not.
 - c. The form should be able to calculate total payment based on selections.
 - d. The form should have payment (using our PayPal account) integrated into it, rather than having payment separate from the registration.
 - e. The form should have a brief description of the NEXT session and/or IBL session, if applicable, to minimize people from signing up who don't really want to be there. This may mean getting descriptions of those sessions ready earlier than in the past.
3. The web registration form should keep track of all of the data that we currently have, including how many people have registered in each subcategory. [Question: Can we remove the line for Saturday breakfast? Can the Saturday lunch line be used as a rough approximation for the local institution?]
4. Access to both the form and the data that the form produces should be granted to more than one individual in particular. It should be available to the person from the executive committee (or designee) overseeing registration, the program chair (if different), the local organizer, and perhaps the student program chair. Registration information should not be made available to a widespread group (such as the executive committee as a whole) as a privacy concern.
5. Registrants should receive a confirmation e-mail upon registering. This e-mail should come from an official e-mail account, such as seawaysection@gmail.com, rather than a personal account.
6. The section's PayPal account should be renamed so that it no longer appears as though payments are personally being made to Gary Towlsley.

In order to achieve this, it is clear that Google Forms, with the App Script, will not suffice. A professional, purchased form product will likely be necessary. In conversations with one of the SJFC web developers, both Gravity Forms and Wufoo were mentioned. Gravity Forms are nice, but only work with WordPress sites, so we would need one of those. Wufoo are also fine, but in order to get a multi-user license, the price jumps to \$359 per year. There are many other alternatives. Also, the maa hosts many section websites. We don't know exactly what resources they have.

Regarding the website, little progress has been made in this regard. Some general recommendations are to be brought forward.

1. A section website should make information about current and future meetings easy to find. This is first and foremost.
2. Any online presence for the section should be accessible by more than one person, even if one person is largely responsible for its content.
3. If (some of the) people responsible for editing the website are to be rotated on and off of this responsibility, then the website should be written in such a way as to not require those participating in this endeavor to be experts in web programming.
4. A section website should be responsive to different screen sizes on different devices.

Respectfully submitted,
-Ryan Gantner

cost and not a separate line item.

- There has been little progress related to changes to the Section website, but the task force included recommendations in its written report including: assuring information about current and upcoming meetings easy to find, administration of the site should not be limited to one person, lower barrier to editing the website, and responsive to different devices.
- Sponsoring Continuing Teacher and Leader Education hours at Section meetings:

Sponsorship of CTLE credits would need to be done by someone at the local host institution (or the Section would need to pursue authorization to do so at some cost and lengthy approval process).

- Motion made, seconded and passed to amend the agenda to discuss potential Siena College meeting before moving on with the remainder of the agenda.
- Siena College venue:
 - Facilities costs for a Siena College meeting are projected at \$3200.
 - **Following extended discussion it was agreed to seek reduction of our facilities costs to a more reasonable \$1000.**
- Project NExT:
 - **Motion made, seconded and passed. The Fellow supported by the Seaway for 2019 will be named in honor of Luise-Charlotte Kappe.**
 - **Motion made, seconded and passed that The Seaway Section make a donation of \$2500 to support a Project NExT Fellow.**
- A note to update the guidelines for hosting section meetings to include signage.
- Redesign of the Section website: Jonathon Cox will ask the committee to continue its work.
- Section merchandise:
 - Blair Madore volunteered to oversee the procurement, selling and storage of merchandise.
 - **The Executive Council approved the expenditure of up to \$1500 to purchase merchandise.**

5. THE EXTENDED EXECUTIVE COMMITTEE MEETING

The meeting moved into Extended Executive Committee with the addition of Blair Madore, Jane Cushman, Keiko Dow, Nate Reff, and Dan Visscher.

- The chair encourages members of the Extended Executive Committee to arrive as early as possible, even during the Executive Committee meeting to facilitate discussions and to reduce repetition.

REPORTS

- Minutes of the Fall 2018 Extended Executive Committee meeting were approved by consensus.
- Update on committee chairs. The chair notes the following changes to committee chairs:
 - Dan Visscher will chair the Seaway NExT Advisory Committee.
 - Gary Towsley will become chair of the Nominations Committee.
- Program Committee. Emphasis for 2019-2020 is on diversity. The Program Committee has already arranged for 3/4 of the speakers for 2019-2020.
- Student Program Committee. Keiko Dow highlighted key features of the Student Program for this meeting: Photo contest with the logo and photo frame, 49 student talks and 20 posters, and BIG Activities Saturday morning.
- Randolph Committee. The Randolph Committee has speakers under consideration for the fall meeting.
- The Gehman Lecture has a speaker at this meeting and will soon begin work on Spring 2020.
- Educational Policies Committee. Nothing to report.
- Distinguished Teaching Award. The winner (Yousuf George) will be announced at the banquet tonight.
- Nominations Committee. The Nominations Committee reports the nomination of Gary Raduns to another term as Secretary and Steve Kilner for another term as Two-Year College Representative.
- Seaway NExT Advisory Committee. Joe Petrillo is leading the session on flipped learning. The group discussed that only 10 of 42 registrants for the Seaway NExT workshop showed up.
- Distinguished Lecturer Committee. The committee reports that Bob Rogers has been selected as the Seaway Section Distinguished Lecturer for 2019-2020.
- Website and Registration committee: Those present had already heard the report, so it was not repeated.
- Liaison Coordinator. We are still looking for liaisons particularly for the two-year colleges and the Canadian institutions.

- Seaway Current editor. Two editions since the last meeting, one late fall and one announcing the meeting and nominations.
- Webmaster. The webmaster was not present. The committee notes that updates seem to have been timely.
- Public Information Officer. The report highlighted the conclusion and outcome of the logo contest, the photo contest to be held at this meeting, and the use of the hashtag #SeawayMAA in social media. There will also be a Seaway “puzzle” during the banquet.

The Executive Committee and Extended Executive Committee adjourned at 6:08 PM.

Respectfully submitted,

Gary L. Raduns, Jr. (Roberts Wesleyan College), Seaway Section Secretary

6. THE BUSINESS MEETING – April 6, 2019

The Business Meeting came to order at approximately 11 AM on Saturday, April 6 with approximately 25 in attendance.

Jonathon Cox reported:

- Nomination of Gary Raduns for another term as Section Secretary and Steven Kilner for another term as Two-Year College Representative. There being no nominations from the floor, the nominees were declared elected by unanimous consent.
- Highlights from the Executive Committee meeting including
 - Updating guidelines for hosting a meeting
 - Our bank account is up
 - The section logo and merchandise using the logo to be available for sale, prizes, etc. The Executive Council approved up to \$1500 to purchase the merchandise, much of which will be recovered by sales.
 - The Executive Council voted to support a Project NExT fellow (\$2500) to be named in honor of Luise-Charlotte Kappe.

The Section Representative to the MAA Congress had nothing new to report.

The Section Secretary had nothing additional to report.

The Treasurer reports that our balance is up approximately \$500 over the past 6 months, in part due to early registrations for the present meeting.

The Program Chair reports that the meeting is well underway with minimal hiccups. There are a lot of student presentations and posters, and also a healthy number of faculty presentations. In addition, talks are underway with Hortensia Soto and Ricardo Conceição. Preparation is also underway for the Spring 2020 at University of Waterloo with Pamela Harris as a potential speaker. 2019-2020 is the Year of Diversity in which we celebrate the diversity we have and the diversity we would like to encourage.

The Student Program Chair reported 125 students registered, 48 student presentations and 19 posters. There is also a BIG Event now for students.

The Randolph Lecture Committee is still working on a speaker for the fall meeting.

The Gehman Lecture Committee extends its thanks to Dave Ross (RIT) for the lecture he just delivered.

The Educational Policies Committee updated the membership on our desire to offer CTLE credits to encourage by participation by K-12 Teachers.

The Distinguished Teaching Award was presented to Yousuf George at the banquet last night. Please encourage nominations.

The Liaison Coordinator reports: If you know who your liaison is, the system is working; if not, please contact Jeff Johannes.

The Seaway Current editor notes two editions of the Current since the Fall Meeting. Elizabeth Wilcox would like to

see short articles from section members who attend JMM or MathFest or those who can highlight events in the AMS.

Seaway NExT held a workshop yesterday on flipped learning and coordinated by Joe Petrillo. Dan Visscher will be taking over as chair of the Seaway NExT Advisory Committee.

The Distinguished Lecturer Committee announced the selection of Bob Rogers as the next Seaway Section Distinguished Lecturer and invites applications to host Bob for a lecture. The Committee also extends its thanks to Dave Brown for his presentations as the inaugural Seaway Section Distinguished Lecturer.

The Committee on Website and Online Registration continues progress on a section registration platform. They note that we may need to go to a paid service as there is a lack of compatibility across “free” platforms (form submission and payment).

The Webmaster was not present to give a report.

The Public Information Officer notes a goal to increase our social media presence beyond Facebook. Christine Uhl encouraged the group to join the photo contest and to join the MAA Seaway Facebook group.

Upcoming meetings:

- November 1-2, 2019 at Ithaca College,
- May 1-2, 2020 at University of Waterloo, and
- Fall 2020 possibly at Siena College.

The meeting adjourned at 11:25 AM.

Respectfully submitted,

Gary L. Raduns, Jr. (Roberts Wesleyan College), Seaway Section Secretary

SEAWAY SECTION of the MATHEMATICAL ASSOCIATION OF AMERICA

2019 FALL MEETING

November 1-2, 2019 at Ithaca College

PROGRAM

Friday afternoon (Friends 309, Ithaca College)

2:00 – 5:00 pm **Workshop: “Beyond $p < 0.05$: what should we teach about hypothesis testing?”**
hosted by Alison Gibbs, University of Toronto

Friday afternoon (Taughannock Falls Meeting Room, Campus Center, Ithaca College)

3:00 – 6:00 pm Meetings of the Executive Committee and Extended Executive Committee

Friday evening (Emerson Suites, Campus Center, Ithaca College)

6:00 – 7:00 pm Social Hour (cash bar) and Registration

7:00 – 8:15 pm Banquet

8:15 – 9:15 pm **Timothy Johnson**, Ithaca College -- *From the Banquet Table to Musical and Mathematical Spaces*

9:30 – 10:30 pm **Game Show**, hosted by **Ryan Gantner**, St. John Fisher College

Saturday Registration and Breakfast (Textor Lobby, Ithaca College)

7:45 – 8:30 am Registration and Breakfast

Saturday Morning (Textor 102, Ithaca College)

8:30 - 8:40 am Welcome Address by **Melanie Stein**, Ithaca College Dean of Humanities and Sciences

8:45 - 9:30 am **Ricardo Conceição**, Gettysburg College -- *On pennies, McNuggets, polynomials and how to help the government save money*

9:40 - 10:10 am Business Meeting

10:15 - 11:00 am **Alison Gibbs**, University of Toronto (**Randolph Lecture**) -- *Navigating Whitewater: preparing our students for unknown challenges*

11:05 am Photo

Saturday Morning Break-Out Sessions (Williams Hall, Ithaca College)

11:15 - 12:15 pm Contributed, Special, and Student Sessions (2 talks in a [20 -10] division)

Saturday Lunch (Emerson Suites, Campus Center, Ithaca College)

12:20 - 1:30 pm **Lunch**

Saturday Afternoon Break-Out Sessions (Williams Hall, Ithaca College)

1:30 - 3:30 pm Contributed, Special, and Student Sessions (4 talks in a [20-10] division)

A light afternoon snack will be available between 3:15 pm and 4:45 pm outside Textor 102.

Saturday Closing Keynote Presentation (Textor 102, Ithaca College)

3:45 - 4:30 pm **Hortensia Soto**, University of Northern Colorado -- *Mi Camino - Transforming Collegiate Teaching of Mathematics - Con Compasión*

NEXT MEETING of the MAA Seaway Section: University of Waterloo, May 1-2, 2020

Contributed Talk Schedule

Fall 2019 MAA Seaway Section Meeting

Williams Hall, Room 309

- 11:15-12:10 IBL Workshop: **Jane Cushman** (Buffalo State College) and **Keiko Dow** (D'Youville College), *Incorporating Active Learning Strategies into Your Classroom*
- 1:30-2:25 **Mihail Barbosu** (Rochester Institute of Technology), *Workshop on Leadership in the Mathematical Sciences: Department Chairpersons as Leaders and Administrators*
- 2:30-3:25 **Cheryl Chute Miller** (SUNY Potsdam), *Listening Session with your Section Chair*

Williams Hall, Room 202

- 11:15-11:40 **Matt Coppenbarger** (Rochester Institute of Technology), *Iterations of the Sisyphus Function*
- 11:45-12:10 **Cesar Aguilar** (SUNY Geneseo), *Eigenvalues of Threshold Graphs*
- 1:30-1:55 **Anurag Agarwal** (Rochester Institute of Technology), *Solutions for some quadratic Diophantine equations*
- 2:00-2:25 **Segar Ngomi** (SUNY Geneseo), *On a Time-Dependent Inverse Course Problem with an Integral Constraint*
- 2:30-2:55 **Abd AlRahman Almomani** (Clarkson University), *Direct Partitioning: Theory, Applications and Challenges*
- 3:00-3:25 **Ahmad Almomani** (SUNY Geneseo), *Locally Anchored Swarm Optimization*

Williams Hall, Room 211

- 11:15-11:40 **Paul Seeburger** (Monroe Community College), *Using the LibreTexts Platform to Customize OER Textbooks for Calculus II and III*
- 11:45-12:10 **Doug Baldwin** (SUNY Geneseo), *Making an OER Calculus Text Our Own*
- 1:30-1:55 **Alex Rennet** (University of Toronto - Mississauga), *A Report on Multiple Large-Class Active Learning Redesigns*
- 2:00-2:25 **Nicole Juersivich** (Nazareth College), *Data Integration in Undergraduate Mathematics Education*
- 2:30-2:55 **John Maceli** (Ithaca College), *Mathematical Card Tricks*
- 3:00-3:25 **Gabriel Prajiture** (SUNY Brockport), *Orthogonality without Inner Products*

Williams Hall, Room 302

11:15-11:40 **Sam Northshield** (SUNY Potsdam), *Tropical Cycles*

11:45-12:10 **James Marengo** (Rochester Institute of Technology), *An upper bound for a sum of cyclic probabilities*

Special Session on Research in Undergraduate Mathematics Education (RUME)

This special session, organized by Sarah Hansuch (SUNY Oswego) and Aaron Weinberg (Ithaca College), is co-sponsored by the MAA SIGMAA-RUME. Presentations include rigorous and scientific studies about students' mathematical cognition and reasoning, studies of teaching practice in inquiry-oriented mathematics classrooms, and design of research-based curricular materials. Presentations build on the existing literature in mathematics education and use established or innovative methodologies as they pertain to the study of undergraduate mathematics education.

Williams Hall, Room 302

1:30-1:55 **Jessica Tornai** (Ithaca College), *Attentive Fidelity: What do Students Pay Attention to in Calculus (Video) Lectures?*

2:00-2:25 **Ellie Fitts Fulmer** (Ithaca College), *Designing Intellectual need-Provoking Tasks for Introductory Calculus*

2:30-2:55 **Aaron Weinburg** (Ithaca College), *How do College Students Read Calculus Textbooks? Using a New Theory to Understand Agency in Didactical Disciplinary Literacy*

3:00-3:25 **Sarah Hanusch** (SUNY Oswego), *Feedback on Proofs: An analysis of faculty practices*

Student Presentation Schedule

Fall 2019 MAA Seaway Section Meeting

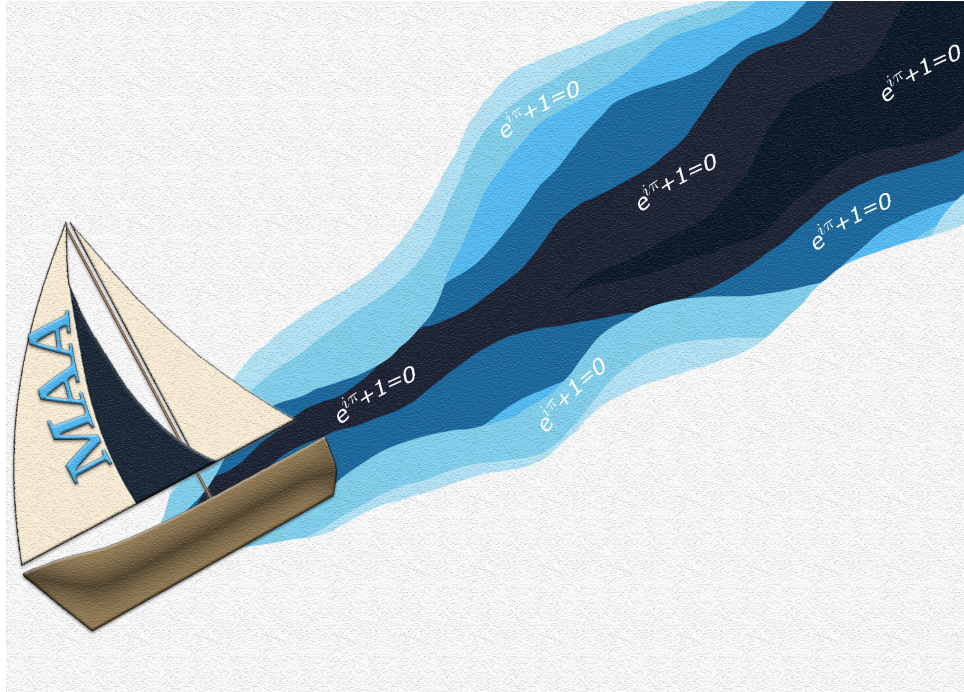
Williams Hall, Room 310

- 11:15-11:25 **Laynie Jensen** (SUNY Cortland), *Modeling Slime Mold Decision-making: The U-shaped Trap Problem*
- 11:30-11:40 **Justin Kipp** (SUNY Brockport), *Prime numbers in between Fibonacci numbers*
- 11:45-11:55 **Hugh McKenny** (Hobart and William Smith Colleges), *Optimizing Fairness in British Parliamentary Debates*
- 12:00-12:10 **Briana Palmer** (SUNY Brockport), *A conjecture of George Miliakos*
- 1:30-1:40 **Quinn Kolt** (Rochester Institute of Technology), *An Upper Bound for the Sum of Cyclic Probabilities*
- 1:45-1:55 **Nicole Zhe** (SUNY Brockport), *A Monotone Sequence Related to Prime Numbers*
- 2:00-2:20 **Molly Noel** (Ithaca College), *Online Change-Point Detection in the Mean of High-Dimensional Data*
- 2:25-2:45 **Matthew Ficarra** (SUNY Geneseo), *Tridiagonal Matrices with Continued Fractions*
- 2:50-3:10 **Ryan Gelnett** (SUNY Oswego), *Folding Polyominoes*

Williams Hall, Room 317

- 11:15-11:25 **Emily Hampston** (SUNY Brockport), *Prime numbers in between Fibonacci numbers*
- 11:30-11:40 **Alexandra Lewis** (SUNY Oneonta), *Coding with Application*
- 11:45-11:55 **Morgan Sherwood** (SUNY Brockport), *Three squares in a circle*
- 12:00-12:10 **Nicolas van Kempen** (SUNY Oswego), *Cocycle Invariant and Oriented Singular Knots*
- 1:30-1:40 **Megan Hardenbrook** (SUNY Brockport), *An Alternate Method of Finding Maximum and Minimum of a Multivariable Function*
- 1:45-1:55 **Una MacDonald** (SUNY Brockport), *Probabilities in Number Theory*
- 2:00-2:20 **Molly Marshall** (SUNY Geneseo), *Standing in a Room Full of Mirrors*
- 2:25-2:45 **Andrew Ditzel** (SUNY Oneonta), *The Congruence of Curves in the Three Dimensional Space*
- 2:50-3:10 **Eric Piato** (SUNY Geneseo), *Critical Groups of Strongly Regular Graphs*

Mathematical Association of America
Seaway Section
Fall Meeting



November 1-2, 2019
Ithaca College
Ithaca, New York

Abstract Booklet

Special Session on RUME Abstracts

This special session, co-organized by Sarah Hansuch (SUNY Oswego) and Aaron Weinberg (Ithaca College), is co-sponsored by the MAA SIGMAA-RUME. Presentations include rigorous and scientific studies about students' mathematical cognition and reasoning, studies of teaching practice in inquiry-oriented mathematics classrooms, and design of research-based curricular materials. Presentations build on the existing literature in mathematics education and use established or innovative methodologies as they pertain to the study of undergraduate mathematics education.

Ellie Fitts Fulmer, Ithaca College

Designing Intellectual need-Provoking Tasks for Introductory Calculus

Abstract: Students in undergraduate mathematics classes are routinely asked to learn from textbooks. In recent years, mathematics and literacy researchers have begun to investigate the ways students learn from discipline-specific texts using the perspective of disciplinary literacy, which focuses on how experts interpret, create, and critique disciplinary texts such as mathematics journal articles. However, textbooks differ from other disciplinary texts because they are specifically prepared for classroom use. Our work analyzes the reading practices of undergraduate calculus students and non-mathematics STEM professors as they interact with excerpts from calculus textbooks. We have proposed the idea of didactical disciplinary literacy to describe the productive reading practices we observed, and this paper zeros in on the role of readers' agency.

Sarah Hanusch, SUNY Oswego

Feedback on Proofs: An analysis of faculty practices

Abstract: Mathematics faculty spend considerable time scoring and providing feedback on student-generated proofs, yet this practice is largely unresearched. In this talk, I explore the types of annotations that professors make on student proof attempts, and the manner in which the feedback is phrased. The results show that professors generously use annotations (like checkmarks) as informal grading tools or to signify things they have read when grading, most feedback focuses on a particular part of the proof that is no more than a few lines, and the majority of feedback does not convey why the feedback was given.

Jessica Tornai, Ithaca College

Attentive Fidelity: What do Students Pay Attention to in Calculus (Video) Lectures?

Abstract: When students watch an instructional video or a lecture, do they pay attention to what the instructor thinks are the most important features? What aspects do students focus on and how does this impact their learning? We report on research using eye-tracking methodology with instructional calculus videos to investigate students' attentive fidelity—the degree to which they attend to the visual imagery that is the subject of the video narration at each moment in time. We describe what students attend to and whether this is correlated to their learning from watching the video.

Aaron Weinburg, Ithaca College*How do College Students Read Calculus Textbooks? Using a New Theory to Understand Agency in Didactical Disciplinary Literacy*

Abstract: Intellectual need is the need that students feel to understand how and why a particular mathematical idea came to be. We are interested in creating tasks that calculus instructors can use to provoke intellectual need. However, the current suggestions for designing such tasks lack detail and don't account for several issues specific to undergraduate introductory calculus. In this theoretical paper, we discuss the idea of intellectual need, explore three issues related to the teaching of calculus, and present a theoretical model that task-designers can use to frame important factors that affect the development and use of these tasks.

Contributed Talk Abstracts**Anurag Agarwal, Rochester Institute of Technology***Solutions for some quadratic Diophantine equations*

Abstract: We will discuss and investigate the positive integer solutions of some quadratic equations whose solutions have links to generalized Fibonacci and Lucas sequences.

Cesar Aguilar, SUNY Geneseo*Eigenvalues of threshold graphs*

Abstract: Problems in algebraic graph theory provide a rich source of research projects for undergraduate students. In this talk, I will present some results obtained over the last couple of summers with SUNY Geneseo undergraduates on the study of the eigenvalues of threshold graphs. The main takeaway of the research is that there is a distinguished threshold graph that plays a prominent role in the study of the spectral properties of the entire class of threshold graphs.

Abd AlRahman AlMomani, Clarkson University*Directed Partitioning : Theory, Applications, and Challenges*

Abstract: In this work, we discuss the graph directed partitioning method, and its applications in complex systems science such as but not limited to coherent structures, computer vision, weather, complex networks analysis, and earth science. We introduce examples and applications from Jupiter, weather movies, network synchronization, and predicting ice shelf cracks in Antarctica's Larsen C ice shelf. *Authors: Abd AlRahman AlMomani and Erik Bollt (Clarkson University).*

Ahmad Almomani, SUNY Geneseo*Locally Anchored Swarm Optimization (LASO)*

Abstract: In the recent decade, Particle Swarm Optimization (PSO) become a favorable global optimization method the fields of science and engineering. Moreover, PSO is a metaheuristic method, and it makes few or no assumptions about the problem being optimized and can search very large spaces of candidate solutions, which made it an efficient method in the field of machine learning, and training of neural networks. However, two main problems face the PSO which are the possibility to trap with local minima and the slow local convergence. This work introduces an efficient method to combine the Swarm Optimization with the Local optimization solvers, which goes beyond the parallel independent implementation to use dynamic internal connections that achieve robust results.

Authors: Abd Alrahman AlMomani (Clardson University) and Ahmad Almomani (SUNY Geneseo).

Doug Baldwin, SUNY Geneseo*Making an OER Calculus Text Our Own*

Abstract: Since academic year 2017-18, SUNY Geneseo's mathematics department has allowed instructors to use an open educational resource (OER) textbook (Openstax Calculus Volume 1) on a trial basis in its first calculus course. Many of our instructors are enthusiastic about this text, except for the large number of typographical errors it contains. During the summer of 2019, we took advantage of the book being an open resource to correct those errors. The result is a custom version of the book that is currently being used as the main text in 7 out of 9 sections of Calculus 1, and as an optional text in another section. In this talk we describe how we carried out this project, the results we have observed so far, future plans for the book, and lessons learned. We hope the project can serve as a model for others interested in using or adapting OER mathematics texts. *Authors: Christopher Leary, George Reuter, Gary Towsley (SUNY Geneseo).*

Matt Coppenbarger, Rochester Institute of Technology*Iterations of the Sisyphus Function*

Abstract: The Sisyphus function is defined and we determine the smallest nonnegative integer n requiring a specified number of iterations of the function that must be applied to n until the sequence generated by the iterations of this function becomes stable or cycles.

Matt Hoffman (Rochester Institute of Technology), Nicole Juersivich (Nazareth College), and Carl Lutzer (Rochester Institute of Technology)

Data Integration in Undergraduate Mathematics Education (DIUME)

Abstract: We will describe our efforts in creating and evaluating the impact of teaching modules based on real-world data so that students have authentic experiences that support and motivate the investigation of concepts and techniques in calculus and linear algebra. Specifically, we looked at (1) how student disposition toward real-world data and the use of technology as a mathematical tool evolved in a course that used the modules and (2) how the completion of the data-driven and technology-integrated modules impacted student achievement in the course. We have collected data from pre and post-module student surveys, pre and post-module student focus groups, student final exam scores, instructor journals, and instructor interviews from multiple courses across our two institutions. We are now in our third year and would like to invite other institutions into the project. During this workshop, we will share our findings to date, takeaways we have learned throughout the study, and the digital modules and supporting technology files. A few computers with MATLAB will be available during the session along with hard copies of the modules so that you can explore and ask questions. To preview the module files, go to shorturl.at/csvCS.

John Maceli, Ithaca College

Mathematical Card Tricks

Abstract: This talk will introduce some mathematical card tricks and their uses in the classroom. Many magic tricks are based on mathematics. We will discuss a few card tricks and the mathematics behind them.

James Marengo, Rochester Institute of Technology

An Upper Bound for a Cyclic Sum of Probabilities

Abstract: Let x_1 , x_2 , and x_3 be real numbers and consider the three statements $x_1 > x_2$, $x_2 > x_3$, and $x_3 > x_1$. Clearly, these statements cannot all be true. But suppose that x_1 , x_2 , and x_3 are realizations of random variables X_1 , X_2 , and X_3 , and that the corresponding statements are each true with the same probability p . Since p cannot be equal to one, the following question arises: how close to one can p be? Can p be greater than $1/2$? Can $p = 0.7$? One can ask a similar question for n random variables. After mentioning a preliminary result that answers these questions and which will be proved in a student talk at this conference, we will show that, given a univariate absolutely continuous probability distribution and an $n - \epsilon > 0$, there are random variables $X_1, X_2, \dots, X_n$ having this distribution and for which each of the probabilities $\Pr(X_1 > X_2)$, $\Pr(X_2 > X_3)$, $\dots$, $\Pr(X_{n-1} > X_n)$, and $\Pr(X_n > X_1)$ exceeds $1 - \epsilon$.

Sedar Ngoma, SUNY Geneseo

On a time-dependent inverse source problem with an integral constraint

Abstract: We investigate an inverse time-dependent source problem for a parabolic partial differential equation with a Neumann boundary condition and subject to an integral constraint. We show the existence, uniqueness, and continuous dependence of solutions. The proof of the existence and uniqueness of solutions yields an algorithm that we used to approximate solutions of the inverse problem using a finite element discretization in space and the backward Euler scheme in time. The errors resulting from our experiments show that the proposed scheme approximates solutions of this inverse problem accurately.

Sam Northshield, SUNY Plattsburgh*Tropical Cycles*

Abstract: The equation $f(n+1)f(n-1) = f(n) + c$ was introduced and studied by Lyness in 1947. When $c = 0$ or $c = 1$, and only then, the equation is “globally periodic” – i.e., every solution is periodic with the same period.

Tropical mathematics is had by replacing x by $+$ and $+$ by $\min$. The tropical Lyness equation is then $f(n+1) + f(n-1) = \min(f(n), c)$. It turns out that every solution is periodic (with some period) but the equation is globally periodic only if $c = 0$ or c equals infinity.

We study these two cases as well as the other “tropical cycles”, i.e., globally periodic equations of the form $f(n+1) + f(n-1) = F(f(n))$, where $F(x)$ is one of x , 0 , $-x$, $\min(x, 0)$, $\max(x, 0)$, $\min(-x, 0)$, $\max(-x, 0)$, $|x|$, or $-|x|$.

Gabriel Prajitura, The College at Brockport*Orthogonality without inner products*

Abstract: We will discuss and compare various concepts of orthogonality of interest in spaces without inner products and will look into their particular forms for the p norms (with p different from 2) in two dimensions.

Alex Rennet, University of Toronto, Mississauga*A Report on multiple Large-Class Active Learning Redesigns*

Abstract: In this talk, I will outline the structure of Active Learning redesigns of large (500+ student) Calculus and Linear Algebra courses at the University of Toronto, Mississauga. We focused on creating a number of in-class and out-of-class components with the intention of maximizing student engagement during class, including online quizzes, polling questions, readings, and in-class activities. I will report on successes, challenges, and next steps for the redesigns. (These redesigns are still in the process of being implemented and adjusted, so this is an interim report. Each project was in collaboration with other faculty.)

Paul Seeburger, Monroe Community College*Using the LibreTexts Platform to Customize OER Textbooks for Calculus II and III*

Abstract: The presenter will share his experiences using the LibreTexts platform to customize OpenStax textbooks for his Calculus II and III courses. LibreTexts includes a WYSIWYG content editor to seamlessly edit the textbook content, using LaTeX only where needed to format math content. You can add your own sections, subsections, examples, and exercises using a consistent numbering system to form a textbook that looks professional and is customized for your course. Using CalcPlot3D, rotatable 3D figures can be added to bring the figures in the textbook to life. Anyone can use these textbooks on the LibreTexts platform or customize them for their own courses. See https://math.libretexts.org/Courses/Monroe_Community_College.

Student Session Abstracts

Andrew Ditzel, SUNY Oneonta

The Congruence of Curves in the Three Dimensional Space

Abstract: In this presentation, we will discuss the notion of congruence for curves in the three dimensional space. In particular, we will see that a necessary and sufficient condition for two curves to be congruent is that they have the same curvature and torsion. Some authors claim that this theorem represents in fact an analogue for curves of the criteria of the congruence of triangles from the two dimensional plane. In order to understand these concepts, we will start by discussing isometries and we will follow the so-called Frenet approach to differentiable curves. Among other things, we will see how the basic Frenet vector fields look like and how to express their derivatives in terms of the vector fields themselves.

Matthew Ficarra, SUNY Geneseo

Tridiagonal Matrices with Continued Fractions

Abstract: In this talk, we derive an alternate form to the recurrence relation of the determinant of a tridiagonal matrix using continued fractions. We then apply our derivation to obtain properties of the eigenvalues of a general threshold graph including the alternating behavior of the magnitudes of the eigenvalues about the value $-1/2$ as well as obtaining equations whose intersections yield the eigenvalues of any threshold graph.

Ryan Gelnett, SUNY Oswego

Folding Polyominoes

Abstract: Continuing the work of Greg Fredrickson, Julia Martin, and Elizabeth Wilcox, for my summer research project I dove into studying folding polyominoes from one-level to two-levels. I classified a few infinite sets of polyominoes that are and are not foldable when restricted to two “legal moves” and along the way I also determined an algorithm to efficiently create foldable polyominoes from non-foldable ones.

Emily Hampston, The College at Brockport

Prime numbers in between Fibonacci numbers

Abstract: I will discuss the existence of prime numbers in between consecutive Fibonacci numbers and in between terms of other linear recursive sequences. *This work was conducted with Justin Kipp.*

Megan Hardenbrook, The College at Brockport

An Alternate Method of Finding Maximum and Minimum of a Multivariable Function

Abstract: I will show how the extrema of a multivariable function can be found using one variable techniques.

Laynie Jensen, SUNY Cortland*Modeling Slime Mold Decision-making: The U-shaped Trap Problem*

Abstract: In biological systems, decision-making is an integral factor in organismal behavior, yet we still do not understand the processes behind it. Modeling the behavior of simple organisms helps us to understand the mechanisms and reasoning that directly result in the behavior of an organism. Single-celled slime mold *Physarum polycephalum* is capable of making complex decisions, all while lacking a nervous system or any nerve-like structures. What is unique about *P. polycephalum* is that it has external memory in the form of the secretion of a repellent chemical trail, which deters the slime mold from returning to previously explored areas. The attractive Keller-Segel model is a well-known model for predicting how slime mold *Dictyostelium* moves. Preliminary numerical analysis of the one-dimensional repulsive Keller-Segel model using a pseudospectral method confirm the results of our stability analysis on the model, and suggest that it can be applied to the movement of *P. polycephalum* as it navigates a U-shaped trap.

Justin Kipp, The College at Brockport*Prime numbers in between Fibonacci numbers*

Abstract: I will discuss the existence of prime numbers in between consecutive Fibonacci numbers and in between terms of other linear recursive sequences. *This work was conducted with Emma (Emily) Hampston.*

Quinn Kolt, Rochester Institute of Technology*An Upper Bound for the Sum of Cyclic Probabilities*

Abstract: Let x_1, x_2 , and x_3 be real numbers and consider the three statements

$$x_1 > x_2, x_2 > x_3, \text{ and } x_3 > x_1. \quad (1)$$

Clearly, these statements cannot all be true because if that were the case, it would follow, for example, that $x_1 > x_1$, which is a contradiction.

But, suppose that x_1, x_2 , and x_3 are realizations of random variables X_1, X_2 , and X_3 respectively and that each of the statements corresponding to those in (1) is true with the same probability p . That is,

$$Pr(X_1 > X_2) = Pr(X_2 > X_3) = Pr(X_3 > X_1) = p.$$

Since p cannot be equal to one, the following question arises: how close to one can p be? Can p be greater than $\frac{1}{2}$? Can $p = 0.7$? One can ask an analogous question for n random variables.

To answer these questions, we derive an upper bound for a cyclic sum of n probabilities, each of which involves inequalities for L random variables that are consecutively-indexed mod n , where $L \in \{2, \dots, n\}$.

Alexandra Lewis, SUNY Oneonta*Coding with Application*

Abstract: Using RStudio application, we developed an R Dashboard Shiny App for ranking 4-year colleges and universities in the US in terms of their 4-year graduation rates. We created functions that read an external data file and returned the name of a 4-year college or university that has the “best” or the “worst” 4-year graduation rate in a particular state. Other graduation outcomes was also be considered. In addition, the App has the ability to take in arguments, such as the name of a state, and a ranking value of a 4-year college or university in that state. Then, the App will return the name of the college that has the specified rankings requested. Moreover, the App can also be used to display a leaflet map and information about the names of the 4-year colleges or universities that are the “best” or “worse” in their respective states based on their 4-year graduation rates and other outcomes. *Authors: Alexandra Lewis, Ryan Minges, and Christopher Robertson (SUNY Oneonta).*

Una MacDonald, The College at Brockport*Probabilities in Number Theory*

Abstract: I will discuss what is the probability that certain sums end up with the same digits.

Molly Marshall, SUNY Geneseo*Standing in a Room Full of Mirrors*

Abstract: Imagine yourself standing in a room full of mirrors, each direction you look there are surrounding copies of you, following each movement. This is what it is like to stand in a platycosm. There exist only 10 varieties of this effect, and in this presentation we will discuss what each of them are, how they look, and how they are created. As well as what it would be like to stand in one, like you are standing in a room full of mirrors. Then I will conclude with how we may be living in a universe that looks just like this, possibly, an infinitely large room of mirrors.

Hugh McKenny, Hobart and William Smith Colleges*Optimizing Fairness in British Parliamentary Debates*

Abstract: It is commonly believed within the collegiate debate circuit that the current structure of debate tournaments is systematically flawed as some of the best teams frequently do not advance out of the preliminary rounds. In other words, debate tournaments, under the current structure, are bad at correctly ranking teams. We developed a computational discrete model to simulate British parliamentary debate tournaments. Through computationally intensive manipulation of various model parameters, we explored alternative tournament structures. To evaluate the correctness of various structures, we developed metrics for the fairness or accuracy of the resulting rankings. In this talk, we will outline what makes debate tournaments unlike other competitions, consider various ranking metrics to use with incomplete and nontransitive tournament outcomes, and highlight a couple of tournament structures that improve the fairness of debate tournaments.

Molly Noel, Ithaca College*Online Change-Point Detection in the Mean of High-Dimensional Data*

Abstract: We develop a method of detecting change points in high-dimensional online data using means. A new stopping rule is proposed that relies on the spatial dependence of the data but does not assume the data follows a Gaussian distribution. We study the asymptotic properties of this new stopping rule. An explicit expression for the average run length (ARL) is derived when there is no change. When there is a change point, an upper bound is established for the expected detection delay (EDD) which demonstrates the impact of data dimensionality and dependence. Our method is applied to simulated data in order to verify its accuracy under a range of parameters. We apply our results to data collected in Beijing, measuring the level of pollutant PM2.5 in the atmosphere. This research was conducted under NSF grant DMS-1916239. *This project was undertaken as a collaboration between Olivia Beck (Colorado State University), Isabelle Hauge (University of Massachusetts Amherst), and Molly Noel (Ithaca College) with faculty advisor Jun Li (Kent State University).*

Briana Palmer, The College at Brockport*A conjecture of George Miliakos*

Abstract: I will discuss a recent conjecture of George Miliakos concerning a relation between consecutive prime numbers. I will show counterexamples and will address some similar statements.

Eric Piato, SUNY Geneseo*Critical Groups of Strongly Regular Graphs*

Abstract: Let $G = (V, E)$ be a simple graph. The *critical group* (also called the *sandpile group*), denoted $K(G)$, is a finite abelian group associated with G . Concretely, viewing the Laplacian matrix L as a linear mapping $\mathbb{Z}^{|V|} \rightarrow \mathbb{Z}^{|V|}$, it turns out that $\mathbb{Z}^V / \text{Im}(L) \cong \mathbb{Z} \oplus K(G)$. In this talk, we discuss our results regarding the critical groups of strongly regular graphs Γ . In particular, we provide a complete characterization of $K(\Gamma)$ under certain assumptions regarding the associated eigenvalues of Γ . In other cases, when the eigenvalues of Γ satisfy different (weaker) conditions, we are able to provide constraints on the form of the critical group. We conclude with a brief discussion regarding the question of existence of a strongly regular graph with given parameters, and explore how our work could be used to resolve this inquiry.

Morgan Sherwood, The College at Brockport*Three squares in a circle*

Abstract: I will discuss a recent problem posted on the internet concerning 3 squares in a circle. I will show why the problem is wrong, how to fix it, and how to solve it.

Nicolas van Kempen, SUNY Oswego
Cocycle Invariant and Oriented Singular Knots

Abstract: Finding an efficient way to compute whether or not two knot diagrams are representations of the same knot is one of the most researched problems in knot theory, with few efficient solutions. In this presentation, we will introduce a new way to compare knots diagrams, the cocycle invariant, which provides an enhancement of current methods to more easily differentiate topologically distinct knots. We will present algebraic structures such as quandles and singquandles, which will enable us to work with oriented singular knots. We will explain and provide examples of how these structures can be related to knot diagrams. We will then present the notion of a quandle cocycle invariant on oriented singular knots, defining precisely the invariant, giving a quick overview of the algorithm we had to develop for this project, and once more providing examples to confirm and illustrate the theory. While researching this invariant over the past summer, we have obtained many promising results, and are still working to further better the invariant.

Nicole Zhe, The College at Brockport
A Monotone Sequence Related to Prime Numbers

Abstract: I will show that a certain sequence related to the sequence of prime numbers is increasing.
