

Allegheny Mountain Section of the Mathematical Association of America

# Allegheny Mountain Newsletter

## Section Meeting at Westminster College



### In this issue:

*Reports from the Governor  
and the Chair of the Section.  
Abstracts of Invited Talks.  
Elections 2014*

### Register NOW for the MAA AlleMo Section Meeting

April 4-5, 2014 at Westminster  
College

As usual, we have an exciting array of invited speakers (Robin Locke, Frank Farris, and Colm Mulcahy) as well as faculty and student talks.

There is also the traditional pizza party, student competition, and book exhibit.

Not registered yet? Don't worry, you can still register online and always at the meeting.

## News from the Governor: Tamara Lakins, Allegheny College

Director of Membership and Marketing Steve Coolbaugh gave a lengthy report on his department's progress on increasing member retention and new member acquisition. Identifying and effectively communicating the benefits of MAA membership is seen as crucial. Of particular note is the new K-12 Teacher category of membership, whose primary goal is to increase participation in the AMC (American Mathematics Competition) contests. On a related note, the Board voted to approve the proposed 2015 dues, which are unchanged from last year.

Treasurer Jim Daniels reported that, while the MAA's total net assets remain stable, the organization continues to experience operating deficits. As I've reported in the past, Jim expects that investments in MAA infrastructure, such as moving customer service in-house (this process is still ongoing), will eventually result in operating surpluses. Associate Treasurer Tensia Soto-Johnson reported that the 2013 operating deficit is considerably lower than projected, although she expects the deficit to increase in 2014.

Associate Secretary Gerard Venema reported that the Meetings and Management Committee voted to discontinue the MAA Short Course

program after the 2014 Joint Meetings in Baltimore. The MAA Short Course, which has been held on the two days prior to the start of the Joint Mathematics Meetings and MathFest, has required considerable resources from the MAA. Since only a small number of MAA members participated in the short courses each year, it was decided that the MAA should redirect its limited resources elsewhere.

Director of Competitions Steven Dunbar and Director of Publications Ivars Peterson will be retiring this year. The MAA is actively recruiting to fill these positions.

The Board endorsed a recent statement prepared by the ASA/MAA Joint Committee on Undergraduate Statistics. This statement, which is available on the MAA website, contains recommendations for qualifications for teaching a modern introductory statistics course, as well as information and resources for assisting departments and faculty teaching such courses. The ASA/MAA statement notes that the ideal minimum qualifications of anyone who teaches an introductory statistics course is a master's degree with a strong concentration in statistics. Recognizing that this is often not possible, however, the recommendation is that anyone teaching an introductory statistics course have at least the equivalent of two statistical methods courses, as well as experience with data analysis beyond the

material taught in the introductory course. Several resources to help mathematics faculty prepare to teach introductory statistics, including minicourses offered by the MAA and the ASA at their national meetings and MAA PREP workshops, are mentioned in the statement

Finally, each Governor participated in two break-out sessions to provide feedback to the Committee on the Undergraduate Program in Mathematics on the soon to be released *2015 Curriculum Guide to Majors in the Mathematical Sciences*.

The Board of Governors meeting at the Baltimore Joint Mathematics Meetings was the last in my term as Governor of the Allegheny Mountain Section, and this is my last report to you in this role. I have very much appreciated having the opportunity not only to serve the Allegheny Mountain Section in this way, but also to participate in the MAA on a more national level.

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## From the Chair: Pam Wovchko, West Virginia Wesleyan College

Happy Spring! I hope to see each of you at the section meeting this year on the beautiful campus of Westminster College, located in the rolling hills of New Wilmington, PA.

Our invited talks this year will appeal to a variety of interests, including group theory, magic, and statistics. More information on the talks by Frank Farris (Santa Clara University), Colm Mulcahy (Spelman College), and Robin Lock (St. Lawrence College) may be found at the meeting website. ([http://sections.maa.org/allegheny/annual\\_meeting\\_2014/meeting2014.htm](http://sections.maa.org/allegheny/annual_meeting_2014/meeting2014.htm))

Along with our stellar line-up of invited speakers, we have some new additions to the program. On Friday evening, we will have a WeBWork workshop, primarily for faculty. WeBWork is an open-source, online homework system for mathematics and sciences courses. On Saturday morning, we will have a career panel, primarily for students.

In the coming months, you will hear more about "The Centennial." The MAA will be turning 100 in 2015, and planning for the celebration has already begun. If you do not normally attend MathFest, you may want to consider attending MathFest 2015 in Washington, D.C.!

# Spring Section Meeting

## Hotel Information

**\*\*Note:** When making a reservation, make sure to call the hotel directly and mention that you are with the MAA Conference. This will get you the discounted rate. Hotels will be filling up quickly, and the hotels are strongly encouraging guests to book as far in advance as possible to avoid a "sell out" situation.

[Hampton Inn & Suites](#) 4 Holiday Blvd. Mercer, PA 16137(724) 748-5744 Amenities: Complimentary hot breakfast, free parking, and free high-speed internet access. Located across from the Grove City Outlet Mall, which is approximately 10 miles from Westminster College. Group Price: \$99 plus tax, under group name "MAA Conference"

[Holiday Inn Express](#) 21 Holiday Blvd. Mercer, PA 16137(724) 748-5514 Amenities: Complimentary hot breakfast, free parking, and free high-speed internet access. Located across from the Grove City Outlet Mall, which is approximately 10 miles from Westminster College. Group Price: \$99 plus tax, under group name "MAA Conference"

[Park Inn by Radison](#) 3377 New Castle Rd. West Middlesex, PA 16159 (724) 528-2501. Amenities: Free parking and free wireless internet. Located approximately 10 miles from Westminster College in West Middlesex, PA, at exit 4B from I-80. Group Price: \$95 plus tax, under group name "Westminster College MAA Conference"

## Section NEXt Workshop

### Putting the Legacy of Martin Gardner to Work in the Classroom.

The theme of Mathematics Awareness Month 2014, which launches on 1 Apr, is "Mathematics, Magic, and Mystery", which is closely patterned after the title of a classic 1956 Dover paperback by the legendary Martin Gardner (1914--2010). Martin was without a doubt the best friend mathematics ever had, and it's fitting that in his centennial year we seize the opportunity to leverage his extensive written legacy---over 100 books---to add to Gardner's record of turning innocent youngsters into mathematics professors (and mathematics professors into innocent youngsters).

Mathematics Awareness Month will provide people with multimedia opportunities to explore 30 updated takes on the kinds of topics Martin made famous via his 300-odd "Mathematical Games" columns for Scientific American, and associated books, including hexaflexagons, magic squares, geometric vanishes, mobius bands, and mathemagic with cards.

We'll explore ways to put some of this material in the classroom today, and hopefully turn new generations on to the magic and mystery of mathematics, and the joys of problem solving and rational thinking. The goal is to inspire many "Aha!" moments.

### Biography

Colm Mulcahy is a professor of mathematics at Spelman College, in Atlanta, where he has taught since 1988. He's currently visiting The American University in Washington, DC. Over the last decade, he has been at the forefront of publishing new mathematical principles and effects for cards, particularly in his long-running bi-monthly Card Colm for the MAA. Some of his card effects have been featured in the New York Times Numberplay blog. His book *Mathematical Card Magic: Fifty-Two New Effects* was published by AK Peters/CRC Press in 2013.

He tweets at @CardColm

## Spring Section Meeting Schedule

### Friday, April 4, 2014

11:30-12:30	Section Officers' Meeting	Patterson Hall, Room 110
12:30-1:30	Section NExT Lunch	Witherspoon Lakeview Room, MCC3
1:30-3:30	Section NExT Workshop	Witherspoon Lakeview Room, MCC3
2:00-5:00	Registration	3rd Floor Atrium, MCC3
2:00-3:45	Book Exhibits	Watto Faculty Commons, MCC3
3:55	Welcome from Westminster	Beeghly Theatre, Patterson Hall
4:00-5:00	Invited Address	Beeghly Theatre, Patterson Hall
	Dr. Colm Mulcahy, Spelman College	
5:15-6:30	Dinner and Awards	Witherspoon Maple Room, MCC3
6:30-7:25	Student Problem Competition	Mueller Theater, MCC2
6:30-7:25	WeBWork Workshop	Patterson Hall, Room 103
6:30-9:30	Book Exhibits	Watto Faculty Commons, MCC3
7:35-9:30	Student Talks	Patterson Hall, various classrooms
9:30-11:00	Pizza Party	Patterson Hall, first floor

### Saturday, April 5, 2014

7:30-8:45	Breakfast	Club Room, MCC2
8:00-8:45	Business Meeting	Club Room, MCC2
8:00-9:00	Registration	3rd Floor Atrium, MCC3
9:00-10:00	Invited Address	Witherspoon Maple Room, MCC3
	Dr. Robin Lock, St. Lawrence University	
10:00-11:45	Book Exhibits	Watto Faculty Commons, MCC3
10:15-11:30	Faculty Talks	Patterson Hall, various classrooms
10:15-11:30	Career Panel	TBA
11:45-12:45	Invited Address	Witherspoon Maple Room, MCC3
	Frank Farris, Santa Clara University	
12:45	Closing Remarks	Witherspoon Maple Room, MCC3

**ACADEMIC BUILDINGS**

1. Old Main  
Wallace Memorial Chapel
2. McGill Memorial Library
3. Thompson-Clark Hall
4. Patterson Hall  
Art Gallery  
Beeghly Theater  
Celebrity Series  
Orr Auditorium
5. Hoyt Science Resources Center
6. Memorial Field House  
Natatorium and Fitness Center  
Buzz Ridd Gymnasium
7. Old 77  
Marge Walker Recreation Center

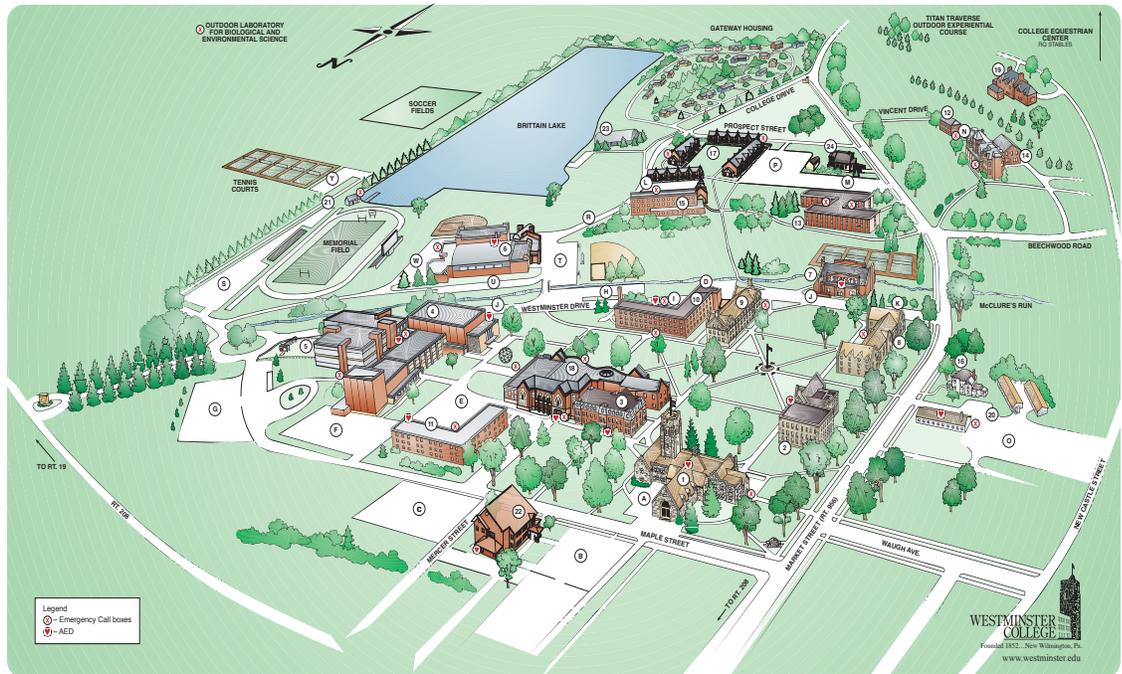
**RESIDENTIAL BUILDINGS**

8. Ferguson Hall
9. Browne Hall  
The Titan Club
10. Galbreath Hall  
Duff Dining Room
11. Shaw Hall  
Student Health Center
12. Jeffers Hall
13. Eichenauer Hall
14. Hillside Hall
15. Russell Hall
16. Thompson House
17. Berlin Village

**ADDITIONAL BUILDINGS**

18. Andrew J. McKelvey Campus Center
19. President's Home
20. Physical Plant Buildings
21. Henley Pavilion
22. Remick Admissions House
23. Anderson Amphitheater
24. Wiley Alumni House

Parking Lots (A-Y)



**Coming from the . . .**

**North**

South on I-79

Exit #113 (London - Grove City)

West on PA 208 approximately 9 miles (Watch in Leesburg and Volant for right turns to stay on PA 208 into New Wilmington)

Turn left at stop light, onto Market Street

Go 2 blocks, College is on the left

**South (Pittsburgh)**

North on I-79

Exit #113 (London - Grove City)

West on PA 208 to New Wilmington; approximately 9 miles (Watch in Leesburg and Volant for right turns to stay on PA 208 into New Wilmington)

Turn left at stop light, onto Market Street

Go 2 blocks, College is on the left

**East**

West on I-80, Exit #15(Mercer)

South on US 19 about 4 miles

West on PA 208 (At sign in town of Leesburg for New Wilmington)

Watch in Volant for right turn to stay on PA 208 into New Wilmington

Turn left at stop light, onto Market Street

Go 2 blocks, College is on the left

**Turnpike**

Exit #28 at Perry Highway

Go North (US 19) for 1 mile, turn right onto to I-79 North

On I-79, take Exit #113 Grove City (Note: Same as from Pittsburgh)

**Southeast (Butler, Kittanning, Indiana)**

West on US 422

North on US 79 approximately 12 miles to exit #113 Grove City (Note: Same as from Pittsburgh)

## Great Speakers Coming to the Spring Section Meeting

### COLM MULCAHY, Spelman College and American University

#### *Martin Gardner: Man of Mathematics, Magic & Mystery*

The theme of Mathematics Awareness Month 2014, which launches on April 1st, is "Mathematics, Magic, and Mystery", which is closely patterned after the title of a classic 1956 Dover paperback by the legendary Martin Gardner (1914--2010).

Martin was without a doubt the best friend mathematics ever had, and it's fitting that in his centennial year we seize the opportunity to leverage his extensive written legacy---over 100 books---to turn new generations on the magic and mystery of mathematics, and the joys of problem solving and rational thinking. The goal is to inspire many "Aha!" moments, and add to Gardner's record of turning innocent youngsters into mathematics professors (and mathematics professors into innocent youngsters).

Mathematics Awareness Month will provide people with multimedia opportunities to explore the kinds of topics Martin made famous via his famous "Mathematical Games" columns for Scientific American, and associated books. These range from hexaflexagons, magic squares, geometric vanishes, mobius bands, and mathemagic, to juggling, Penrose tiles and the connection between card shuffling and fractals.

We'll preview some of the Mathematics Awareness Month activities, while surveying Martin Gardner's achievements, and highlighting the potential for major outreach into the nation's youth.

Twitter users may enjoy following @MathAware (Mathematics Awareness Month), @WWMGT (What Would Martin Gardner Tweet?) and @MGardner100th (Martin Gardner Centennial).

### FRANK FARRIS, Santa Clara University

#### *Polyhedral Symmetry in the Plane*

When we classify plane patterns by their symmetries, there is a famous trichotomy: Plane patterns may be

rosettes, friezes, or wallpaper patterns. The symmetries of a rosette all share a single fixed point; a frieze pattern is invariant under translation in one direction, a wallpaper pattern in two. In this talk, we undercut tradition, which normally insists that symmetries must preserve distances. We allow certain distance-deforming transformations to play the role of symmetries. In particular, we show how the polyhedral groups can act on the plane. To make patterns with these new transformations as symmetries, we construct functions invariant under the polyhedral actions. One of these is shown below. Do you believe that it has the same symmetries as a tetrahedron? This talk, accessible to undergraduate mathematics students, combines a little group theory, a little complex analysis, and several other ingredients in the service of mathematics and art.

### ROBIN LOCKE, St. Lawrence University

#### *Statistical Inference Using Scrambles and Bootstraps*

Does drinking beer attract mosquitoes? What's the average asking price for all used Mustang cars for sale on the web? Is the "malevolence" of a sports team's uniform related to the number of penalties it gets? These are questions of statistical inference -- reasoning from the data in a sample to say something about an entire population. Can we address such questions with just simple ideas (like random sampling and visual displays) that are easily accessible to students, before introducing lots of technical machinery and theoretical distributions that may hinder understanding key concepts like what a p-value really measures? We'll illustrate how we can use intuitive simulations, implemented with freely available, web-based software (StatKey), to address the opening questions and help students appreciate core ideas of statistical reasoning.

## Workshops and History

### Workshop: Intro to WeBWork – at the Spring Meeting

WeBWork is an open-source online homework supported by the MAA. At the spring meeting at Westminster, Tim Flowers will be giving a hands-on workshop for WeBWork beginners. Participants will get to interact with WeBWork as students and then learn the basics of the instructor tools. You do not need to register separately for this workshop.

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### SIMIODE

We are building a complete environment for teachers and learners of differential equations in which modeling and technology are used upfront and throughout the learning process at [www.simiode.org](http://www.simiode.org).

SIMIODE - Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations is about teaching differential equations in a new and natural manner. SIMIODE offers a community in which colleagues can form class groups in privacy, offer students projects of their own design or call upon refereed and reviewed modeling scenarios from SIMIODE resources.

Teachers can communicate, collaborate, publish, teach, explore, contribute, etc. and students can also work collaboratively on challenging modeling scenarios offered by experienced teachers from around the world as well as form project work groups and keep group efforts for member efforts.

Join us at [www.simiode.org](http://www.simiode.org). It is all FREE!

Contact: Brian Winkel, Director, Emeritus Professor of Mathematical Sciences, United States Military Academy, West Point NY.

[BrianWinkel@simiode.org](mailto:BrianWinkel@simiode.org).

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### The History of Mathematics – and the MAA John Bukowski, Section Historian

I am a member of HOM SIGMAA, the History of Mathematics Special Interest Group of the MAA, and I have recently been selected to serve as HOM SIGMAA's representative to the Allegheny Mountain Section. Our goals are to promote interest and activity in the history of mathematics at the sectional level and to promote HOM SIGMAA in general. As our 2014 section meeting draws closer, I want to encourage people to give talks on the history of mathematics. Such talks usually attract a large audience and are well received by the members of our section. I also want to encourage everyone to consider joining HOM SIGMAA, which you can do as part of your MAA membership. We are very active at the Joint Meetings and MathFest, with contributed paper sessions, invited addresses, and a business meeting. I want to mention a specific activity of the HOM SIGMAA, the Student Paper Contest. While the deadline for this year's contest is very soon (March 19), maybe there are students with suitable papers already written. More information about the contest and HOM SIGMAA in general can be found at our website, <http://historyofmathematics.org/>.

I also want to remind everyone that the MAA Centennial will be celebrated in 2015. Soon I will be developing a brief history of the Allegheny Mountain Section that will be posted on the Section website. We will also celebrate the Centennial at next year's section meeting. The big celebration, however, will come at MathFest 2015, which will be held in Washington, DC, the home of the MAA. It promises to be an exciting and fun meeting, and it is a short drive from the Allegheny Mountain Section!

If anyone has any ideas for history of mathematics activities in our Section, or ideas for our celebration of the MAA Centennial, please let me know – I'd love to hear from you. You can contact me at [bukowski@juniata.edu](mailto:bukowski@juniata.edu). I look forward to seeing all of you in a few weeks at Westminster College!

## Description of Open Positions

### Report of the Nominating Committee Submitted by John Bukowski, Chair

The members of the Nominating Committee are John Bukowski (Juniata College), Chair; Eric Bancroft (Grove City College); and John Thompson (University of Pittsburgh at Johnstown). The committee is pleased to present the following slate of candidates for the election at the 2014 Spring Meeting at Westminster College. The candidates are as follows:

#### Chair-Elect

Rachelle (Shelly) R Bouchat, Slippery Rock University  
James Sellers, Penn State University

#### Second Vice Chair

Alfred Dahma, Indiana University of Pennsylvania  
David Miller, West Virginia University  
Emily Sprague, Edinboro University

#### Secretary

Kimberly Burch, Indiana University of Pennsylvania

The election will be held at the Business Meeting on Saturday, April 5. Additional nominations will be taken from the floor.

### Candidate Biographies

#### Rachelle (Shelly) R Bouchat, Slippery Rock University – Candidate for Chair-Elect

Dr. Rachelle (Shelly) R Bouchat is currently a tenured assistant professor at Slippery Rock University, but she will be continuing her career at Indiana University of Pennsylvania as a tenured assistant professor beginning with the Fall 2014 semester. She received her bachelor's degree from the University of Pittsburgh at Johnstown in 2003, her master's degree from the University of Kentucky in 2005, and her doctoral degree from the University of Kentucky in 2008. All three of Shelly's degrees are in mathematics, and her research interests include topics in commutative algebra, graph theory, and combinatorics. She was a 2009-2010 Project NEXT fellow and has been the Director of E-Communications for the Allegheny Mountain Section of the MAA for the past five years.

#### James Sellers, Penn State University – Candidate for Chair-Elect

James Sellers is a professor and the Director of the Undergraduate Mathematics Program at Penn State University. He has served the Allegheny Mountain Section of the MAA as governor (2008-2011) as well as webmaster (2002-2010). He has been a member of numerous committees for the national MAA, including the Committee on the Undergraduate Program in Mathematics (2007-2013) as well as the AMS-MAA Committee on Teaching Assistants and Part-Time Instructors (2010-2013). He is currently the chair of the MAA's Invited Paper Session Committee and is also a member of the Hedrick Lecturer Selection Committee. He has organized a number of MathFest invited paper sessions and panel discussions and has also served for many years as a speaker and consultant for the national Project NEXT program. He has received the section's Teaching Award (2006), Mentoring Award (2009), and Service Award (2013), and has been an invited speaker at the Allegheny Mountain, Eastern Pennsylvania and Delaware, and Ohio Section meetings. He has been

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### Newsletter Editor

Dr. Robert W. Vallin

Slippery Rock University

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PARTICIPATE. INVESTIGATE. EDUCATE.

privileged to be a Visiting Fellow at the Isaac Newton Institute, Cambridge University (2008) and a Fulbright Scholar at the Johannes Kepler University and Research Institute for Symbolic Computation in Austria (2012). He is currently a member of the College Board Advanced Placement Calculus Development Committee and is an instructor for the Great Courses.

Alfred Dahma, Indiana University of Pennsylvania – Candidate for Second Vice Chair

I received my Ph.D. from the University of Pittsburgh in 2009. My research area includes functional analysis, real analysis, and frame theory. As an Assistant Professor at IUP, I have been active in the Section for five years, attending various meetings and workshops. I served on the Nominating Committee (2011-2012) and am currently serving on the Service Award Selection Committee.

David Miller, West Virginia University – Candidate for Second Vice Chair

Dr. David Miller is an Associate Professor and the Undergraduate Program Director at West Virginia University. He earned his M.S. degree in Applied Mathematics and PhD in Mathematics with an emphasis in Undergraduate Mathematics Education from Oklahoma State University. He was awarded the 2013 Allegheny Mountain Section and 2012-2013 Eberly College of Arts and Science (ECAS) Teaching Awards. He loves teaching upper level undergraduate mathematics courses and has developed the Emerging Scholars Program in Calculus I through IV at WVU to encourage underrepresented students in Science, Technology, Engineering, and Mathematics. He is the PI on the NSF Louis Stokes Minority Participation grant and Co-PI on both the NSF Robert Noyce program and NSF CCLI phase II grant at WVU. He is a Project NExT fellow (sepia dot, 2006) and has published research articles in: middle school mathematics, undergraduate mathematics education, the use of technology in the classroom, and expository mathematics.

Emily Sprague, Edinboro University – Candidate for Second Vice Chair

Emily Sprague is a tenured assistant professor at Edinboro University where she has taught for eight years. She holds a B.A. in Mathematics from Castleton State College (Vermont) and a PhD in Pure Mathematics from Kent State University. She is a Measure Theorist. Before embarking on mathematical studies she was a symphony cellist for fifteen years and holds a B.Mus. from New England Conservatory and an M.Mus. from the University of Texas at Austin. These days aside from the usual full load of teaching and committees, she coordinates the mathematics undergraduate research initiatives at Edinboro University, has written a First Year Experience seminar called Mathematics of Musical Consonance, and is learning to play the banjo.

Kimberly Burch, Indiana University of Pennsylvania – Candidate for Secretary

Kimberly Burch is an Associate Professor at Indiana University of Pennsylvania. She earned her Ph.D. in graph theory from the University of Pittsburgh in 2002. She has served as Second and First Vice-Chair of the section and as the Secretary. She is interested in how technology such as clickers and online homework systems can improve student performance and enjoys mentoring undergraduate students.

