Points & Angles

Newsletter of the Metropolitan Mathematics Club of Chicago
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Math and Identity: How Our History Shapes Us

March Speaker

Esther Song

From I-90 & Southbound I-294: Exit at I-190 West to O'Hare; Exit onto North Mannheim Rd.; Take Mannheim Rd. North 2.25 miles.

From Northbound I-294: Exit at West Touhy Ave.; Take Touhy Ave. to Mannheim Rd.; Turn right on Mannheim Rd.

Public Transit: Take the CTA Blue Line to the Rosemont Bus Terminal; Take Pace Bus #223 to Touhy Ave. & Lee Rd.; Walk East on Touhy to Mannheim Rd.

Friday, March 16, 2018
5:30 PM Doors Open, 6:00 PM Social Hour
7:00 PM Dinner & Talk

Fountain Blue Banquets & Convention Center
2300 Mannheim Rd., Des Plaines
(847) 298-3636
$43 for Members, $49 for Nonmembers

Reserve by Noon, Monday March 12 , 2018
Online at WWW.MMCCHICAGO.ORG
or by phone at (847) - 486 - 4291

See the note on Page 2 regarding special entrees for this meeting

Esther Song

Esther Song's work focuses on rehumanizing math classrooms through student voice, identity, and teacher reflection. She is the co-founder of Nepantla Teachers Community, a collective of mathematics teachers committed to social justice in Chicagoland. This group was formed to be encourage teachers to develop humanizing practices and challenge traditional structures that do not serve students who are historically oppressed. She serves on the ICTM board as the 9-12 director and on the 2018 APME Editorial Panel for the volume Rehumanizing Mathematics for Students who are Black, Latin, and Indigenous. She is currently a mathematics teacher in Chicago Public Schools at Lindblom Math and Science Academy. Aside from teaching, she enjoys salsa dancing, improv, bicycling on the city streets, and any other activity that requires responding quickly to ever-changing stimuli.

Talk description:
Often when we think about math teaching and identity, we specifically refer to student identities. But identity work must also include teachers' identities. How have our histories, cultures, and relationships impacted the way we understand mathematics, teaching, and our students? Taking time to understand ourselves and how our history shapes us as "math people" will allow us to become more empathetic advocates for our students, make stronger connections, and develop robust learning communities in the classroom.

Points From The Interior

By Matthew Moran

Happy March! I hope you had a joyous Groundhog Day, and I guess you are awaiting the arrival of spring as much as I am. The annual MMC Conference of Workshops came and went, and was a huge success. Huge thanks is due to the conference organizers, Karen Lopez, Nicolette Norris, and Rose Sterr, for planning a great day of professional development opportunities. The conference would also not have happened without the speakers, so a big thank you to everyone that presented at the conference. Remember, it is never too early to start planning your 2019 talk.

You'll never guess who I carpooled with from the Conference of Workshops this year... Esther Song, our next Friday night dinner speaker! Esther is a voice in mathematics education that you definitely want to hear. She will be talking about Math and Identity. Get your reservations in ASAP for Esther's talk on Friday, March 16th. There will be a fish option available for an extra charge of seven dollars at the March meeting.

Since you have your calendar out to double check that you can make the March meeting, flip it way ahead to June of 2019. The USACAS conference will take place on the weekend of June 14-16 in Highland Park. This is going to be an excellent conference with world class speakers talking about teaching with technology.

CAS (computer algebra system) is a misunderstood acronym. There is so much more to problem solving with CAS than using a handheld calculator. With the plethora of freely available tools we are confronted with in our daily teaching, this conference will be centered on finding the right tool to solve the problem at hand. This is a key question that needs to be addressed in modern mathematics education...Did you hear about the Ohio State Legislature passing a bill to allow for students to skip Algebra 2 in order to take more computer science? Stay tuned for details about USACAS in 2019 and how MMC will be involved.

I look forward to seeing you all on March 16th. Don't forget to make your reservation early, especially if you are requesting a fish meal.

Special Dinner Requests

During the Lenten Season we have two non-meat options at the March 16th dinner meeting.
Fish (salmon) for extra $7
Vegetarian for regular price
Special meals can only be available if they are ordered beforehand through reservations.
All special meal orders must have a name with them.

January Meeting Summary

By Serg Cvetkovic

Let Us Teach Wondering Given by Paul J. Karafiol on Friday, January 19, 2018

What does it mean to wonder? Many dictionaries would define it as "to think or speculate curiously." If we examine the evolution of mathematics, from the development of simple counting to geometry to calculus to topology and beyond, we should be able to realize that this evolution could have never happened if individuals did not raise and seek answers to questions driven by their own personal curiosities…if they did not WONDER.

As teachers of mathematics, if we truly want for our students to embrace the beauty and awesomeness of mathematics, and become lifelong math enthusiasts that are constantly and voraciously looking to expand their mathematical horizons, should we not teach them to wonder? Of equal importance, how exactly do we teach wondering in a mathematics classroom? This was the topic of Paul J. Karafiol's talk.

For those in the greater Chicago math community, PJ (the name that Paul commonly goes by) does not need an introduction. Not only has he taught math for over twenty years, he co-founded Math Circles of Chicago and QED: Chicago's Youth Mathematics Symposium , coached Chicago Area All-Star Math Team, authored the American Regions Math League contest, co-authored the UCSMP, and is an all-around math enthusiast. Interesting footnote: PJ, with his famous "What Other Questions can we Ask?" approach, has been compared to Plato and Aristotle by former students of his.

PJ began his talk by posing the question of "how many different pentominos (think TETRIS blocks + 1) are there?" After all, if we want to teach wondering, would it not make sense to begin a class with a wondering exercise? I mean, coming in and saying,"okay class, today we are going to talk about [insert random topic], so take out your notebooks and open to page 314" does not exactly get the dendrites jumping around the same way a thought provoking question does. After a few good minutes of tables working together to discover how many distinct arrangements of five congruent squares joined edge to edge (i.e. a pentomino) exist, PJ brought the discussion back, asking tables to not only share out how many pentominos they could make, but also what other questions can we ask? Members of the audience asked such questions like "how many ways can we color the tiles?", "how many arrangements will fold into a box?", and "how many non-planar arrangements exist?". Not only did the activity generate some really interesting questions, but the fact that an activity meant to find an answer to one question was generating other questions is of equal, possibly greater importance. To make a long story short, starting a math class with a novel and thought provoking problem is a great way to immediately immerse your students into "math mode," as it ignites the curiosity and generates even more questions, as was the case with the MMC audience.

Once the audience's sense of wonder was elevated by the pentomino problem and the questions generated by it, PJ proceeded about how struggling with mathematics goes hand in hand with wondering, as things like contextualizing, decontextualizing, redefining, and extending rather difficult problems (such as those found in Math Circles of Chicago) create a process in which more and more questions are generated, and discourse and engagement in the task are taken to a deeper and more abstract level of understanding.

January Meeting Summary Continued

PJ continued onward, introducing a new problem that he used to demonstrate how exactly we can deconstruct and reconstruct a problem. The problem was entitled Cooperative Siblings, and goes as follows: Aaron and Jordan work together to paint a fence. If Aaron were working by himself, he could paint the fence in 3 hours. If Jordan were working by himself, he could paint the fence in 6 hours. How long will it take them if they work together? After the tables worked collaboratively to come up with the solution of 2 hours, PJ suggested changing the data, to which the audience responded try different values of 3 and 6. When he suggested to extend the problem, the audience responded with adding a third sibling (named Henrietta). What if we change the data AND generalize to rewrite the problem as $1/3 + 1/j = 1/a$ OR $1/a + 1/6 = 1/n$, and ask how does n depend on a or j, and what happens if a or j get smaller? What about if we add a condition and ask for what values of j or a is an integer? We could also invert the problem and ask if it takes Aaron and Jordan two hours to finish the job working together, what is the whole number of hours that it takes each sibling working individually? This methodology of reformatting the problem in multiple ways follows the methodology of the great Hungarian mathematician George Polya, whose methodology of solving a problem through continuous questioning provided the shoulders for future giants like PJ to stand on.

The talk then transitioned to the philosopher Douglas Hofstadter's "Knob Theory" of creativity, which essentially states that different parameters in a problem are knobs, and twiddling the knobs to see what they do is an essential part of problem solving. For example, what if we thought of a conic section on the Cartesian plane, or a polynomial function as a stereo with knobs? What happens when we twiddle the knobs and change the parameters? PJ demonstrated how we can start by taking the equation of a circle and adding coefficients greater than 1 to make it an ellipse, or subtract the a and y coefficients instead of adding them to make a hyperbola….or make the exponents even numbers greater than two to make a superellipse…..or even make the exponents fractions and transform the figure into a superasteroid! Changing the parameters of mathematical figures and equations is a great way to ignite discourse that leads to conjectures, which can lead to discourse that leads to proof!

The Academy Award winning presentation (or it should be nominated at the very least) was concluded with PJ talking about how Math Circles of Chicago provides an excellent atmosphere for students to explore novel and more complex math problems through questioning, extending, and making conjectures. Additionally, he mentioned how QED: Chicago's Youth Mathematics Symposium is a prime example of how wondering about mathematics leads students to partake in (and sometimes actually publish) mathematical research.

In conclusion, let us ask ourselves, does lecturing for an hour, day after day make our students love math? How about throwing piles of worksheets at them all the time? I didn't think so. If we as teachers fell in love with math, should we not want our students to have that same experience of falling in love with the beauty and elegance of mathematics? When PJ mentioned how he went from hating math in middle school to falling in love with it through great teachers that instilled the sense of wonder in him, it reminded me of how Bernoulli inspired Euler, who went on to inspire LaGrange. This type of inspirational chain, from teacher to pupil should be the rule and not the exception. But how do we do this? How do we ignite that passion, that hunger for mathematical knowledge? Well….let us begin by giving our students interesting problems to think about. Let us teach them to embrace the struggle and think about problems in new ways. Let us teach them to question….to reflect….to make conjectures. Let us teach them WONDERING!

MMC Elections 2018

Be on the lookout for a ballot in your mailbox arriving soon for the election of a new president as well as board members to serve for a term of three years. Below is list of people running as well as a short bio about them. Remember, every vote matters so please vote when you receive your ballot.

Candidate for President-Elect - There is one vacancy for President-Elect.

Susan Brown
York Community High School

Candidates for Director - (Board Members).

Danielle Leibowitz
Danielle has been teaching high school math for three years, the first two at Roberto Clemente Community Academy in Chicago where she started and coached the school's math team, and currently at Mundelein High School in the suburbs. While Danielle has only been teaching a short time, she has demonstrated a commitment to education through leadership roles, such as serving on the University of Illinois Board of Trustees, engaging in rigorous professional development, including a 6-week summer program at Boston University called "PROMYS for Teachers," and joining professional learning communities, like the MMC. Danielle's dream is for all students, regardless of background, to have access to a high quality education, and she hopes to join the MMC Board to work with a community that shares in this mission (and she heard there would be pi).

Beth Ann Ball
Beth Ann Ball attended her first MMC meeting 17 years ago while student teaching, and has been a member ever since. Beth Ann is now in her 16th year teaching mathematics at Maine South High School and as the mother of 3 grown children, she now has time to give back to the organization that she knows made her a better mathematician and a better mathematics educator.

Lisa Parker
Lincoln Way Central

Steve Condie
Illinois Math and Science Academy

Reccommended Readings From Paul J. Karafiol

How to Solve It, by George S. Polya

Piet Hein's Superellipse, by Martin Gardner

Metamagical Themas, by Douglas Hofstadter

Godel, Escher, Bach:An Eternal Golden Braid, by Douglas Hofstadter

MMC Board Report

By Lynn Bond

The MMC Board of Directors met on Thursday, January 25th at York High School in Elmhurst.

The Board discussed the MMC Scholarship applications, dinner, and presentation plans and also some final preparations for the Conference of Workshops. A committee was formed to partner with MEECAS to host a joint event for the USACAS conference planned for summer of 2019 in the Chicago area.

MMC has a new Twitter account: @MMCChicago, as well as a Facebook page: https://www.facebook.com/MMCChicago/. Like, follow, share, tweet, and hashtag MMC!

The Board approved the slate for the election of directors this spring. Other discussion included a future professional development event, writing a statement defining MMC's purpose, and a service project. More information will follow as plans are solidified.

The next MMC Board meeting will be held on May 20th at a location TBD. Anyone interested in attending the next Board meeting, please contact Carrie Fraher at cfraher@glenbrook225.org.

Gratitude For Conference of Workshops

The MMC Conference of Workshop held on Saturday February 10, was a success despite the major snow storm. Over 450 participants were on hand, attending 90 workshops given by fantastic speakers, experiencing and sharing activities and ideas to bring to their classrooms.

A huge thank goes out site coordinator Rose Sterr (who was also a conference chair), and Benet Academy and their staff members who made everything run like clockwork, providing not only the beautiful facilities, but also food service, technology, directions, and all other little things that go on behind the scenes that take months of planning. Thanks also to all our MMC volunteers who put together folders, came early, and stayed late to make sure everything was in the right place for the workshops and was cleaned afterwards.

We certainly know that teachers have enough on their plates, but fortunately about 100 decided they could do even more, and generously gave of their time and expertise by running workshops for the conference. The concept of teachers sharing and helping other teachers is why the MMC Conference has been such a success. The idea that teaching doesn't end at our own classroom door is crucial to bettering Chicagoland's mathematics education. We owe all of our speakers special thanks for all their efforts. Also, some big thanks go out to the afternoon post-session speakers who gave 10-minute talks that stretched our thinking and inspired us to take action. Thank you John, Mark, Barbara, Kim, Matt and Mary!

Soon you'll be hearing about the MMC Conference of Workshops 2019, so start planning now! If you presented this year, think about a workshop you would want to run next year. And if you attended, plan to attend next year, but also consider presenting- everyone has those great ideas that they can share. We have a wonderful resource in Chicagoland with our spectacular mathematics community, and with would be great to see even more people willing to share their ideas.

Nicolette Norris, Rose Sterr, and Karen Lopez, 2018 Conference Co-Chairs

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Photos from the February 10, 2018 MMC Conference of Workshops

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Chicago, IL 60631

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☐3 years ($90) ☐retired, 1 yr ($28)

MEMBERSHIP COST $

DONATIONS

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SPEAKER FUND $

TOTAL AMOUNT OF CHECK $

* The student and 1st-year teacher memberships are only available as electronic-only.

Make check payable to *MMC*

Upcoming Events

Fri., Mar. 16	Esther Song	**Math and Identity: How Our History Shapes Us**
Fri., May 11	Zalman Usiskin	**Mathematics and Diamonds: The Many Facets of Mathematics**

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Send upcoming event items to jharding@d120.org no later than the date of the MMC dinner meeting preceding the issue in which the item should appear. All items are subject to editing.

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Mailing Label

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