

# Points & Angles

Newsletter of the Metropolitan Mathematics Club of Chicago  
Volume XLVIII No. 6 Apr./May. 2019

## Sense-Making, Ideas, Curiosity, and Learning

### May Speaker Annie Fetter



We are so fortunate to have Annie Fetter back at MMC for our next dinner meeting. Annie has a talent for helping teachers utilize students' natural curiosity about the world to aid in the learning of mathematics. She helps teachers understand how students' propensities to wonder can facilitate meaningful learning in mathematics. This works for students young and old. As Annie said, "We know we're supposed to be teaching math, but are we also teaching curiosity and a love of learning? Come hear stories about art, weaving, technology use, perseverance, and, yes, math, as well as strategies for tweaking the classroom so that you're leveraging more and more of your students' ideas." You don't want to miss Annie sharing "Sense-Making, Ideas, Curiosity, and Learning."

Annie Fetter was one of the founders of The Math Forum and worked there from 1992 until it was dissolved at the end of 2017. She worked on the project that wrote the first version of The Geometer's Sketchpad and first met Paul Christmas when she was leading a GSP workshop at his school around 1994. She currently speaks at conferences and works with schools and districts about eliciting student thinking and how to use it to inform instruction. She also addresses the fact that students should think that math makes sense. She reads a lot, is an unapologetic beer snob, plays bass and sings at bluegrass jams and in an all-girl band, bakes sourdough bread, and is mother to two of the best dogs a cat lover could have.

We will continue this wonderful experience on Saturday morning when Annie Fetter leads two workshops for us at Glenbrook South High School in Glenview. Attend a workshop and get a discount on the Friday dinner meeting! Reservations for the workshops must be made and paid for ahead of time. Don't miss this opportunity! All information is on the MMC website.



**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, May 10, 2019**

Doors Open/Social Hour: 5:45 PM  
Dinner & Talk: 7:00 PM

**Fountain Blue Banquet & Convention Center**

2300 Mannheim Rd., Des Plaines  
847-298-3636

\$43 for Members, \$49 for Nonmembers

**Reserve by noon, Monday, May 6**

Online at [www.mmccchicago.org](http://www.mmccchicago.org)  
or by phone at 847-486-4291

# Annie Fetter's Saturday Workshop Information

For Grades 7-12: The practices of Noticing and Wondering can help all students generate mathematical ideas and make connections among them. Noticing and Wondering pave the way for the development of other problem-solving strategies and support a classroom culture that gives every student a way to contribute mathematically, while treating math as a creative process. We'll explore scenarios around a variety of content, including patterns, geometric relationships, and polynomials, and look at how Noticing and Wondering can provide multiple entry points for students. We'll consider different activity structures that rely on Noticing and Wondering, such as visual patterns and 3-Act Tasks, and ponder how to use these ideas to tweak existing (and perhaps "required") curricula.

For Grades K-6: The very first Mathematical Practice, "make sense of problems," includes many ideas that have long been foci of literacy instruction. Yet when "math" starts, both teachers and students often leave those good habits behind. We'll look at examples of this and explore how to leverage literacy routines in math.

## Points from the Interior

by Mary Wiltjer

I'm writing this in San Diego, where I'm attending the NCTM Annual Meeting. It's Thursday evening, my talk was given earlier today, I've attended some great sessions, seen several (but not nearly enough) of my favorite Chicagoland math people, and now I should be sleeping. However, my mind is racing with how we have to do much better to improve mathematics education in the U.S., and I always believe if something big is going to happen in math ed, it has to start in Chicago.

After listening to NCTM's President, Robert Berry, I'm fired up to blow apart our current system of tracking. Data doesn't support tracking. Achievement gaps repeatedly point to tracking as a major contributor to the disparity. We know students make practically permanent decisions about "who they are" based on the track in which we place them – and this is true for kids on the top as well as the bottom of the heap. We have lived with and reinforced this paradigm that some people just have a greater propensity for mathematics – or even more damning that some kids are "math people" and some are not. We have been controlling the learning of mathematics as if we are bouncers of an exclusive night club, where just waiting in line isn't enough to get in. One has to spark the interest or wallet of the bouncer. I don't want to be the gatekeeper anymore. I don't want to turn people away from lives rich with mathematical understanding and appreciation. I'd rather be the DJ spinning tunes and driving the beat, so everyone lets down their guard and has a great time together.

Another talk that is still buzzing around my brain is Cathy Seeley's. She knows most of us want all kids to do well in mathematics, yet we impede this reality regularly and often unknowingly. Do we believe little Jenny or Johnny can succeed? Yes, but Jenny comes from an unsupportive family. Yes, but Johnny has an I.E.P. Are we focusing on a student's potential challenges and missing their real potential? Are we creating microaggressions or even macroaggressions? What are we doing every day with every kid to try not to be the next person at school that sends a message that some children are not capable or worthy of our best opportunities? Are we worried how the accumulation of negative experiences in school make it the last place a kid ever wants to be? Haven't we all had bad experiences when we were students? Probably, but it wasn't too many of them. Even if you work hard not to be the person that beats kids up, what do you do to stop injustices, large and small? All of this goes on in a mathematics classroom every day.

I keep thinking that teachers should have their own Hippocratic Oath, where we promise to work diligently to never bring harm to students. I fantasize that everyone takes it and then takes it to heart. Teachers not only stop putting limits on students, but they stand up to administrations, school boards, parents, and false paradigms. Every kid is given rich, enthralling opportunities with true support and understanding. School lunches are as good as the food that comes out of the U.S. Congressional Cafeteria. Kids being hospitalized for anxiety is so uncommon it's thought to be an urban legend. A huge bonfire is made from all the standardized tests we refuse to give. Property values are not impacted by their local schools because all local schools are stellar, and the way we can tell a kid is off to math class is by the pure sense of joy on their face.

Hey, a girl can dream, but then again, a girl can take action. This girl is ready for the latter.

# March Dinner Meeting Talk – Eli Luberoff

by Nicolette Norris

The dinner talk started off with a Calvin and Hobbes cartoon. Calvin tells his dad, “If I had a computer I could do better on this book report.” His dad then states that he still would need to read the book and tell the computer what he wants to say. Calvin then says he doesn’t understand why all the fuss about computers.

Eli Luberoff’s talk focused on the use of technology in the math classroom. He believes that technology should think with students and not for students. The first activity that Eli asked the audience to do was to predict what would be the answer when you Googled  $50 + 10\%$ . Google gave an answer of 55. Eli then asked the audience to predict what answer Google would give if you put in  $50 + 50\% + 50\%$ . Then the audience was asked to determine how many possible outcomes there were, by adding parentheses and changing the order. Three possible answers were found, 50.2, 60.5, and 55.11. (Google says 75.5.)



The question is, “How does Google know what we are thinking?” Eric Schmidt, Chairman and CEO of Google, stated in a forum in 2010 that Google is aiming for accuracy in what the user needs. After many searches by the user, Google would learn his or her habits. Eventually, the user would not need to type anything. Google would be doing all of the thinking for them. Eli suggested that some technology of today was designed to make students think less. This is the opposite of our goal as teachers. Our goal is to make students think as much as possible.

Eli then went into four criteria that should be used when determining what technology should be used in the classroom with students. The first question someone usually asks when choosing technology is, “How cool is the tech?” Eli says what should be asked is, “How cool is the thinking the tech enables?”

Eli’s first example of tech that seems cool was the app, Photo Math. The commercial for the app shows a girl doing homework and then using Photo Math to check her answer. The app seems cool because a picture can be taken of the problem to get the answer and even the steps to the solution can be viewed. The problem with Photo Math is it does not require students to think. Some examples of cool technology that allow a student to think are The Geometer’s Sketchpad or Line Rider. In each of these, the technology blends into the background and allows the student to think.

Eli’s next criterion for technology is that the tech should allow the student to be wrong. He said it is easy for students to be wrong on paper, but when it comes to the computer, students are sometimes not allowed to be wrong. For example, a question asks what is the midline for a trigonometric function but gives the picture of the function with the minimum and maximum point shown on the graph. Students can easily get the correct answer because of how the problem is presented. Eli contrasts this example with the cannon man from the Function Carnival activity. In the game, a man is shot out of a cannon and falls to the ground. Students first watch a video of a man being shot out of a cannon. They are asked to draw the path of the man and then replay the video to see if the cannon man follows the path. Students can redraw the path as many times as needed in order to draw the most accurate path. The students are allowed to be wrong in the activity, which leads to more thinking.

Another criterion that can be used when choosing tech for students is one that relishes ambiguity. The audience was asked to play Tile Pile. In the activity, the student is asked to tile the floor with different-shaped tiles: a line tile, an L-tile, a T-tile, and a Z-tile. The challenge question at the end of the activity asked if you could tile the floor with just one type of tile. All were possible except the Z-tile. The challenge question leads the students to some ambiguity because there was no indication in the directions that one of the tiles would not work. Technology that gets the student to think should ask the impossible question.

Eli’s last criterion for tech is that it should allow students to pose questions. The example he used to demonstrate this criterion was the Parabola Slalom activity. In the activity, students first have to move a parabola so that it passes through the slalom gates. Then they write equations of parabolas so that parts of the parabola pass through the gates. At the end of the activity, students are asked to create an impossible slalom challenge. They

## March Dinner Meeting Talk (cont.)

have to create a design that other students in the class could not do. Rich thinking occurs while students create their own challenge. Eli said that when students were asked what their favorite part of the activity was, many of them stated creating their own challenges and completing challenges created by their classmates. Eli ended his talk by re-emphasizing the goal of technology should be to get students to think as much as possible. This can be done by choosing technology that allows the student to think, allows them to have the wrong answer, allows for ambiguity, and allows the student to pose questions.

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## USACAS 2019

Extending Math Education with CAS and Other Technology Tools

Attend the ELEVENTH INTERNATIONAL Expanded Technology Conference

Organized by MEECAS (Mathematics Educators Exploring Computer Algebra Systems)

WHERE: Highland Park High School, Highland Park, IL  
WHEN: Saturday, June 15, 2019 8:15 AM - 3:30 PM  
Sunday, June 16, 2019 8:00 AM - 1:00 PM

**Opening Dinner:** Friday, June 14, 2019; hosted by MMC at the Renaissance Chicago North Shore Hotel  
**Up to date information will be posted at [usacas.org](http://usacas.org).**

Registration: **\$85 for USACAS 11 (before May 9, 2019; \$100 on or after May 9, 2019)**  
**\$95 for USACAS 11 AND the MMC Friday night dinner**  
**(before May 9, 2019; \$110 on or after May 9, 2019)**  
**\$55 for MMC Friday night dinner (before May 9, 2019; \$65 on or after May 9, 2019)**  
*\*Fee includes continental breakfast, a box lunch, and snacks*

**Optional Saturday evening dinner and Architectural Boat Tour--transportation included: \$55**

### **IMPORTANT NOTE ABOUT THE MMC DINNER RESERVATIONS:**

**REGISTRATION DEADLINE** for the MMC dinner or the combination USACAS 11/MMC dinner is **Wednesday, June 5**. Payment must be made at the time of registration. **Registration is ONLINE only with a CREDIT CARD.**

Please submit your registration using our direct link: <https://dist113.revtrak.net/usacas#/list>.

**NEW! Graduate Credit will be available through Central Michigan University.**  
**NEW! Professional Development Hours will be available for Illinois teachers.**

Any questions can be directed to Ilene Hamilton at [ihamilton2341@gmail.com](mailto:ihamilton2341@gmail.com).

# Board Notes

By Beth Ann Ball

The MMC Board of Directors met on Monday, February 25, 2019, at Maine South High School in Park Ridge, Illinois.

The board appointed Carol Nenne and Paul Christmas to fill the two vacant positions on the board of directors. The University of Chicago Lab Schools were a wonderful host for the MMC Conference of Workshops in January. The board discussed the upcoming dinner meeting and Saturday workshops with Eli Luberoff, the May meeting and Saturday workshop with Annie Fetter, and the MMC/USACAS dinner with Tom Dick on June 14, 2019, at the Renaissance Chicago North Shore Hotel in Northbrook.

The next MMC Board meeting will be held on Sunday, May 19, at 1 p.m. in Palos Park. MMC members are welcome to attend any board meeting. Anyone interested in attending the next board meeting, please contact Matt Moran at [matthew.j.moran@gmail.com](mailto:matthew.j.moran@gmail.com).

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## Follow MMC on Social Media!





# MMC Board of Directors—Candidate Biographies

## President-Elect:

**Serg Cvetkovic:** Serg currently serves as MMC's community relations liaison. He has taught mathematics in the Chicago Public Schools for 15 years, with the last 8 being at Kelly High School on the southwest side, where he also coaches the school's math team. A strong supporter of access and equity in mathematics education, Serg is diligently working to increase exposure of more advanced mathematics topics to students from marginalized communities. He has had considerable success with this endeavor as a teacher in Math Circles of Chicago. In his spare time, Serg enjoys bicycling, reading comic books and science-fiction novels, and training to hopefully one day become a crossword puzzle champion.

## Board:

**Steve Starr:** Steve is a retired CPS mathematics teacher and math department chair who taught at Lake View High School in Chicago for 20 years, sustaining a successful AP Calculus program where minority and low-income students were motivated to take advanced mathematics. At Lake View, he also developed and taught a three-week unit called “What’s Fair?” which introduced students to some of the mathematics involved with social issues relating to fairness and allocation of resources. In this unit, students explored fair division, voting and gerrymandering, game theory, and mathematical modeling of fair income. Before teaching mathematics, he worked in shops as a woodworker, a machinist and industrial model maker, and a toy developer. Since retiring, he continues his passion for mathematics, staying involved with MMC, MC2, and other area math organizations, sharing ideas at workshops, supervising student teachers, tutoring, and teaching.

**Aimee Hart:** Aimee has been teaching mathematics for 21 years. She began her career at Josephinum Academy, a small Catholic girls’ school in Chicago and taught at Marymount International School in Rome and Walter Payton College Prep before settling at New Trier High School 13 years ago. She currently teaches geometry, BC Calculus, and Intro to Computer Science. In the past, she coached the math team at both Payton and New Trier but more recently switched to coaching her children’s basketball teams.

**Liam Keigher:** Liam has been teaching at Larkin High School in Elgin since 1995 and has been the head math coach since 2000. He especially enjoys doing math in addition to teaching it. Liam has served on a number of district curriculum committees in math and computer science. He is Larkin’s sponsor for Mu Alpha Theta, hosting an annual middle school math contest. He has been a member of Larkin’s technology committee since 1996 and has served at various times as the chair or co-chair. He is on the board of the North Suburban Math League and has been its written topics committee chair since 2008. He assists with the Chicago Area All-Star Math team that competes in the American Regions Math League. Liam would like to see more offerings for people to study math collaboratively in a non-classroom environment, like a consortium, at their own pace. He loves what MMC brings to the study of mathematics and believes in always learning and becoming better at one’s craft. MMC seems like the perfect opportunity to realize these dreams. Besides, the dinners are fantastic!

## Officers

- Mary Wiltjer, President
- Lisa Parker, President-Elect
- Matthew Moran, Past President
- Sheila Hardin, Board Chair
- Beth Ann Ball, Secretary
- Carol Nenne, Treasurer

## Directors

- Beth Ann Ball (2018-2021)  
Maine South H. S., Park Ridge
- Paul Christmas (2019-2019)  
Illinois State University, Prospect Heights
- Steve Condie (2018–2021)  
Illinois Math & Science Academy (retired), Aurora
- Serg Cvetkovic (2017–2020)  
Thomas Kelly H.S., Chicago
- Peter DeCraene (2017–2020)  
Evanston Township H.S. Evanston
- Carrie Fraher (2018-2021)  
Glenbrook South H.S., Glenview
- Sheila Hardin (2017–2020)  
Oak Park & River Forest H.S., Oak Park
- Danielle Leibowitz (2018–2021)  
Mundelein H.S., Mundelein
- Karen Lopez (2016–2019)  
Larkin H. S., Elgin
- Matthew Moran (2017–2020)  
Chicago Public Schools (retired)
- Carol Nenne (2019-2019)  
Illinois State University, Cicero
- Nicolette Norris (2016-2019)  
Chicago Vocational Academy, Chicago
- Lisa Parker (2018–2021)  
Lincoln-Way Central H.S., New Lenox
- Rose Sterr (2016–2019)  
Benet Academy, Lisle
- Mary Wiltjer (2016–2019)  
Glenbrook South H.S., Glenview

## Officials

- Community Relations and Development  
Serg Cvetkovic
- Conference Co-Chairs  
Nicolette Norris  
Rose Sterr
- Conference Registrar  
Peter DeCraene
- Finance Committee Chair  
Lisa Parker
- Historian  
Paul Christmas
- Membership Coordinator  
Mary Wiltjer
- NCTM/ICTM Affiliate Representative  
Steve Condie
- Points & Angles Editor  
Sara Curran
- Publicity and Posters  
Paul Christmas
- Scholarship Chair  
Carrie Fraher
- Social Media Chair  
Danielle Leibowitz
- Webmaster  
Peter DeCraene

# Candidate Biographies (cont.)

**Mary Wiltjer:** Mary has been teaching for over 25 years, with the last 11 at Glenbrook South High School. On the MMC Board, she has had many roles, including President, Membership Coordinator, and Conference Co-Chair. In her time with MMC, Mary is most proud of the additional, high-quality professional development opportunities she has brought to members at very affordable prices, such as the Saturday and summer workshops and the MMC conference post-session speakers.

**Nicolette Norris:** Nicolette is currently teaching at Chicago Vocational High School. She has been with the Chicago Public Schools for 17 years and has been teaching for 23 years. Nicolette presented at the 2005 MMC Conference of Workshops. She then joined MMC in 2006. She has served on the board for the past 4 years. Nicolette is one of the co-chairs for the MMC Conference of Workshops.

**Rose Sterr:** Rose currently teaches at Benet Academy and has been teaching math at various levels for over 30 years. She has been a member of MMC for about 10 years but remembers attending her first MMC dinner years ago at the Como Inn! For the past 2 years, she has co-chaired the MMC Conference of Workshops and continues to marvel at the talent we have in the Chicagoland area. She feels events such as this have been so valuable to her teaching, and she would be honored to continue representing this wonderful organization.

**Is your membership current? Check your mailing label to see when your membership expires. You can renew by mail with the form below or renew in person at the next dinner meeting.**

NAME		PREFERRED CONTACT Check one: <input type="checkbox"/> Home <input type="checkbox"/> Work	
HOME ADDRESS			
CITY	STATE	ZIP	
HOME PHONE		HOME E-MAIL	
EMPLOYER			
WORK ADDR			
CITY	STATE	ZIP	
WORK PHONE		WORK E-MAIL	
ELECTRONIC-ONLY MEMBERSHIP <small>Check the box below for electronic-only membership. You will receive an email with a direct link to each issue of <u>Points &amp; Angles</u> when it is posted on the web site, often before paper copies are mailed. You will no longer receive <u>Points &amp; Angles</u> by mail.</small>		MEMBERSHIP TYPE <small>Check one:</small> <input type="checkbox"/> 1 year (\$35) <input type="checkbox"/> student*, 1 yr (\$22) <input type="checkbox"/> 2 years (\$65) <input type="checkbox"/> 1 <sup>st</sup> yr teacher*, 1 yr (\$22) <input type="checkbox"/> 3 years (\$90) <input type="checkbox"/> retired, 1 yr (\$28)	
<input type="checkbox"/> Electronic-Only Membership			
FORM USE <small>Check one:</small> <input type="checkbox"/> New Membership <input type="checkbox"/> Renewal <input type="checkbox"/> Former Member <input type="checkbox"/> Change of Address		MEMBERSHIP COST \$	
<small>* The student and 1<sup>st</sup>-year teacher memberships are only available as electronic-only.</small>		DONATIONS	
		SCHOLARSHIP FUND \$	
		SPEAKER FUND \$	
		<b>TOTAL AMOUNT OF CHECK \$</b>	

**Make check payable to MMC**

**MMC Membership and Change of Address Form**  
 Mail completed form and check to:  
 MMC  
 7339 W. Ibsen St.  
 Chicago, IL

# Upcoming Events

Fri., May 10 Annie Fetter  
Sat., May 11 Annie Fetter

**Sense-Making, Ideas, Curiosity, and Learning  
Workshop**

Fri., June 14 Tom Dick

**Cubics, Conics, CAS, and a Curious Connection Called  
“The Most Marvelous Theorem in Mathematics!”**

Sat.-Sun., June 15-16

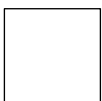
**USACAS Conference, Highland Park**

Wed.-Sat., April 1-4, 2020

**NCTM Centennial Annual Meeting: Celebrating 100 Years—  
Looking Back and Moving Forward, Chicago**

Send upcoming event items to [sburnett\\_308@yahoo.com](mailto:sburnett_308@yahoo.com) 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.

Your membership renewal date appears in the upper right corner of the label



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