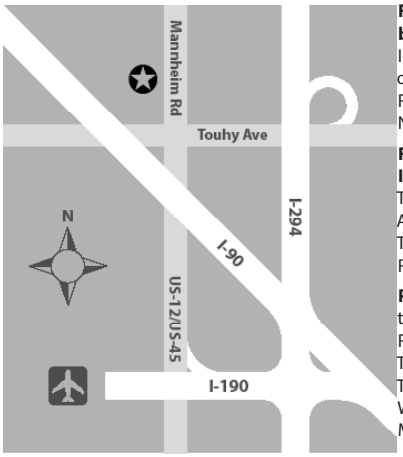
Points & Angles

Newsletter of the Metropolitan Mathematics Club of Chicago
Volume XLVI No. 3 Nov./Dec. 2016

A Finite Look At The Infinite

November Speaker

Jeffrey Bergen



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, Dec. 2, 2016
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 Nov. 28
Online at WWW.MMCCHICAGO.ORG
or by phone at (847) - 486 - 4291

Jeffrey Bergen grew up in Brooklyn and received his B.S. in Mathematics from Brooklyn College in 1976. He received his M.S. in 1977 and Ph.D. in 1981 from the University of Chicago. His DePaul career began in 1981, where he continues to do research in the branch of abstract algebra known as noncommutative ring theory. For the last 20 years, much of his teaching, research, and service activities have dealt with improving the preparation of high school mathematics teachers. He and his wife Donna have four children and five grandchildren. When not doing mathematics, he is probably watching baseball or a formulaic drama series.

His research has received external support from the English Speaking Union, the National Science Foundation, and the National Security Agency. He has given lectures in 7 countries and co-authored papers with 19 mathematicians around the world. For twelve years, he was a member of the Maine Township District 207 School Board and served one term as president. He assisted in the creation of the School Based Health Center at Maine East High School and served on their Advisory Board for six years.

His textbook "A Concrete Approach to Abstract Algebra" was published in 2010 by Elsevier. In 2001, he received the Excellence in Teaching Award from the College of Liberal Arts and Sciences and, in 2007, received their Cortelyou-Lowery Award for Excellence.

Points From The Interior

By Carrie Fraher

I'm writing this article on the day after the Cubs won the World Series. It's been surprisingly emotional as so many of us remember family members and friends who are no longer with us to celebrate this event. Whether you're a Cubs fan or not, there was a lot to like about this World Series. I found the increased use of statistical analysis and the public reaction particularly interesting.

The 2011 film Moneyball discussed how the Oakland Athletics were able to use sabermetrics to build a better team with less money. It would definitely be on a list of my favorite movies where mathematics has a starring role. Theo Epstein used a similar model to help the Boston Red Sox win a World Series in 2004 and now the Chicago Cubs in 2016. Advanced statistical analysis of the game is less than 40 years old and the term sabermetrics is derived from SABR - Society for American Baseball Research.

The use of data over tradition and gut instincts led to controversy in this World Series as we saw two teams using their bullpens in surprising ways. Traditionally, a team brings in their closer for the last three outs of a game. However, in recent years, the Leverage Index has been calculated to show that sometimes it is more beneficial to bring the closer in earlier than the ninth inning. Based on the score, the inning, and many other factors, managers may use Expected Win Percentage to help them make crucial decisions.

It's clear that data is playing a larger role in baseball. Is data cool? Are fans happy with the use of data in sports? Do managers feel pressure to use data over gut instinct? Tony La Russa of the Arizona Diamondbacks was asked about analytics and remarked, "We'll use it. It stops before the first pitch is thrown. ... It's not that we devalue it. We value it when it's used appropriately. We do not value its intrusion into the game." This 2016 World Series showcased two managers who are open to using data during the game for player selection, fielding shifts, and many other decisions.

Baseball statistics aren't just for professional analysts. Connor Garcia Whitehill, a 14-year old from California, built a statistical model last spring that correctly predicted 4 out of 6 division winners and the World Series match-up. Of course, he also predicted a Cubs victory. He said, "The fun thing about statistics is that they help you to understand the world around you, be it baseball, politics or just numbers in general."

I want to see all of you at Fountain Blue on December 2nd when we welcome Dr. Jeffrey Bergen of DePaul. I know of many MMC members who have been part of the MAMED program at DePaul. Dr. Bergen has been an integral part of my education in that program. I feel that he has a real gift for taking complicated topics in mathematics and explaining them so clearly. During those long weekend class sessions, he brought a lot of humor and entertainment into our classes. I look forward to his upcoming presentation "A Finite Look at the Infinite" and hope to see a great turnout.

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October Meeting Summary

By Rose Sterr

David "Coach G" Ginsburg shared some resources with those in attendance at the October 21 dinner meeting which centered around the topic of procedural fluency. Many of those can be found in his Education Week blog, Coach G's Teaching Tips. Another resource is the NCTM position on Procedural Fluency in Mathematics:

NCTM Position

Procedural fluency is a critical component of mathematical proficiency. Procedural fluency is the ability to apply procedures accurately, efficiently, and flexibly; to transfer procedures to different problems and contexts; to build or modify procedures from other procedures; and to recognize when one strategy or procedure is more appropriate to apply than another. To develop procedural fluency, students need experience in integrating concepts and procedures and building on familiar procedures as they create their own informal strategies and procedures. Students need opportunities to justify both informal strategies and commonly used procedures mathematically, to support and justify their choices of appropriate procedures, and to strengthen their understanding and skill through distributed practice.

Ginsburg's objective was for the crowd to learn teaching strategies that would help students develop procedural fluency and conceptual understanding. He himself learned to appreciate student struggles from reflecting on his own challenges in understanding math as a student and ultimately his beginning years of teaching math in the classroom where he felt unsuccessful. So, he posed the following two problems to the audience to discuss at their tables and suited up with his toolbelt equipped with his train whistle which he uses to interrupt discussion for special announcements and to end the discussions. While the students are discussing the problem, Ginsburg is working the room, listening and gathering information to share and summarize.

Problem #1: Simplify: $1\frac{3}{4} \div \frac{1}{2} =$

Problem #2:
$$x + y = 22$$
$$y + z = 27$$
$$z + x = 25$$
Find x, y, and z.

In the debriefing, Ginsburg had several attendees share their "take aways" as to how they arrived at the answer. He particularly wanted to highlight procedures different from the conventional. For example, with the division of fractions, instead of "flip and multiply", one method which illustrates procedure vs. answer is to draw two pie charts divided into fourths. How many "1/2" groups can be formed? In essence, are the students doing the math vs. understanding the math?

Ginsburg promotes a different instructional model than one that is teacher based and begins with direct instruction or what he refers to as "I Do". He suggests to begin with "You Do", independent student learning. If there is less lecturing on the teacher's part, then there is more learning required of the student, more information they are required to gather, more responsibility put on them. So, Ginsburg supports a Hierarchy of Help which begins with "You Do", student learning and discovery; "We Do", collaboration of students and guided instruction; and "I Do", teacher's assessment of what they observe students doing and discussing in class.

Teachers should consider the following when assigning problems to students:

1. Learn new math content
2. Deepen understanding of previous content
3. Reveal and resolve misconceptions
4. Develop procedural fluency

Simply put, procedural fluency is more than memorizing and "answer getting". It is the math we teach and how we teach it. Ginsburg can be contacted at david@ginsburgcoaching.com.

Metropolitan Mathematics Club of Chicago

100 YEARS 1913-2013

Affiliate Report

By Jeff Harding

Have you joined NCTM? For only $52, you can have a full year membership full of lots of great benefits. For an additional fee, you can subscribe to some excellent Mathematics Journals. Membership in NCTM means access to the resources you need to turn your passion into measurable student learning outcomes. n addition to exclusive resources and the latest research, membership in NCTM connects you to a network of over 70,000 fellow math educators who share your commitment to student success. Enhance your teaching expertise when you exchange solutions and first-hand insights with this extensive network. If you register for a membership, be sure to indicate MMC as your affiliate to continue helping out our organization at no additional cost to you!

ICTM News

Thanks to all of you that attended the ICTM conference in Peoria this year. Hopefully you were able to attain something new from the event. If you were there on Saturday morning and got the opportunity to see NCTM President Matt Larson speak, you were no doubt wowed. Matt was our speaker at an earlier MMC dinner meeting this year. It's just a constant reminder of the quality of the speakers that come to the dinners. Don't miss out on the next opportunity to join us for an MMC dinner.

Call For Chicago NCTM Speakers

By Pat Trafton

MMC and ICTM are very excited to be co-hosting the NCTM Regional Confernce that will take place in Chicago from Nov. 29 - Dec 1, 2017. To make the program offerings exciting for all who attend and because your knowledge and experiences would be a benefit for others to learn from, we encourage you to submit a proposal to speak. Lead speakers receive complimentary registration! That's a 100% savings!

Strands that will be featured and their descriptions can be found on the NCTM website via the link: http://www.nctm.org/Conferences-and-Professional-Development/Be-a-Speaker/

We hope you'll consider submitting a proposal to speak at the Chicago NCTM Regional Conference! The deadline for submitting a speaker proposal is December 1, 2016. Don't delay; submit your proposal today!

T³ Promotional Discount

The 2017 T³ International Conference will be held at the Hyatt Regency in Chicago Illinois from March 10-12, 2017. The October 15th deadline for the early bird $100 registration has passed, BUT don't despair! If you contact Ray Klein at rklein9019@aol.com, he will share a special T3 instructor promotion that will allow you to register for the special $100 registration fee.

COMING SOON: The MMC Conference of Workshops!

Save the date: Saturday, January 28, 2017
at Evanston Township High School.

The conference program books have been sent and the program is alson on the MMC website.

Registration is now open on the website.

Remember that registration for workshops is done on a first-come, first-served basis, so register early!

Don't miss this!

MMC Membership and Change of Address Form

Mail completed form and check to:

MMC
7339 W. Ibsen St.
Chicago, IL 60631

NAME

PREFERRED CONTACT
Check one:
☐Home ☐Work

HOME ADDRESS

CITY | STATE | ZIP

HOME PHONE | HOME E-MAIL

EMPLOYER

WORK ADDRESS

CITY | STATE | ZIP

WORK PHONE | WORK E-MAIL

ELECTRONIC-ONLY MEMBERSHIP
Check the box below for electronic-only membership. You will receive an email with a direct link to each issue of Points & Angles when it is posted on the web site, often before paper copies are mailed. You will no longer receive Points & Angles by mail.

☐Electronic-Only Membership

FORM USE
Check one:
☐New Membership ☐Renewal
☐Former Member ☐Change of Address

MEMBERSHIP TYPE
Check one:
☐1 year ($35) ☐student*, 1 yr ($22)
☐2 years ($65) ☐1st yr teacher*, 1 yr ($22)
☐3 years ($90) ☐retired, 1 yr ($28)

MEMBERSHIP COST $

DONATIONS

SCHOLARSHIP FUND $

SPEAKER FUND $

TOTAL AMOUNT OF CHECK $

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

Make check payable to *MMC*

Index

Upcoming Events

Fri., Dec. 2	Jeffrey Bergen	A Finite Look at the Infinite
Fri., Jan. 20	Maryjoy Heineman & Matthew Kaiser	Geometry in Construction: A Contextualized Approach to Teaching Mathematics
Sat., Jan 28	Evanston Twp H.S.	MMC Conference of Workshops
Fri., Mar 3	Nicole Enzinger	Integers: A Space for Mathematical Play
Fri., May 19	Hyman Bass	Mathematical Variations on Some Familiar School Themes

Send upcoming event items to jomalley@glenbrook225.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.

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

MAILING LABEL

METROPOLITAN MATHEMATICS CLUB OF CHICAGO
c/o MMC
7339 W. Ibsen St.
Chicago, IL 60631

STAMP

MMC Scholarship

The Metropolitan Mathematics Club of Chicago is offering a $2,000 scholarship for a high school senior who will pursue a career in the teaching of mathematics. In addition, up to two Filliman Scholarships may be awarded for the same amount (funded by a gift from the Filliman estate). The selected students, their parents and their sponsoring teachers will be invited to the May 5th MMC Dinner meeting at which time the scholarship recipients will be honored.

A selection committee of MMC members appointed by the Board of Directors will determine the scholarship awards. To be eligible, an applicant must be sponsored by a member of the MMC, submit the application, have an official transcript sent, request a letter of recommendation from a mathematics teacher, and respond to the prompts in point E below such that all of the materials are received by March 10, 2017. The committee will evaluate applications, and will make a recommendation to the Board of Directors as to the awarding of the scholarship.

The guidelines used for selection shall be:

A. Demonstration of overall academic scholarship with an inclusion of at least eight semesters of college preparatory mathematics. (A minimum cumulative grade point average of 3.0, where A = 4.)

B. A statement of the intention to pursue a career in mathematics teaching.

C. Indication of participation in extra-curricular activities, especially those that may have a positive influence on a teaching career.

D. A letter of recommendation from a math teacher who is familiar with the applicant's academic performance and his or her potential as a mathematics teacher.

E. A short response from the candidate (1-2 paragraphs) to each of the following prompts.

   a. What qualities do you possess that will help you in a teaching career?

   b. Describe a teacher who has had an impact on your education.

   c. Was there a time when you struggled with a concept in a math (or other) class? What did you do?

   d. What was your favorite math class? Why?

   e. Describe your favorite math problem. What makes it so great?

   f. What excites you about mathematics?

   g. Why do you want to teach mathematics? *This response may be longer than the others if necessary*

In addition to the form on the next page, applicants must also send:

1. A letter of recommendation from a mathematics teacher. *Preferably not sent through the applicant**
2. A current transcript for seven semesters of high school.*
3. Responses to the prompts in point E above.

**Letters of recommendation and transcripts may be sent by separate mail.*

Application for the MMC and Filliman Scholarships

Application Deadline: Received by March 10, 2017

Name: _____ Date: _____

Address: _____

_____

Email: _____

School: _____

School Address: _____

_____

Home Phone: _____ School Phone: _____

Sponsoring Teacher (must be a member of MMC): _____

Please complete the following:

Overall Grade Point Average (A=4, B=3, C=2, D=1, F=0): _____

Mathematics Courses and Grade Taken	Mathematics Course Grade Received
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Extracurricular Activities (inside or outside of school): _____

_____

_____

_____

I (*print your name*) _____ intend to pursue a career in Mathematics education.

Signed _____

Please send all information by 3/10/17 to:

Laura Kaplan
Chicago Academy for the Arts
1010 West Chicago Avenue
Chicago, IL 60642

phone: 312.421.0202
fax: 312.421.3816
email: lkaplan@chicagoartsacademy.org