MetroMath

Newsletter

Metropolitan New York Section of
The Mathematical Association of America

April 2014

Bronx	**Brooklyn**	**Columbia**	**Dutchess**
Greene	**Manhattan**	**Nassau**	**Orange**
Putnam	**Queens**	**Richmond**	**Rockland**
Suffolk	**Sullivan**	**Ulster**	**Westchester**

A N N U A L   M E E T I N G

Saturday, 3 May 2014
8:30 AM − 5:20 PM

Nassau Community College (SUNY)
Garden City, NY

(*More Information Contained Within*)

SECTION OFFICERS

Section Governor (2011 – 2014)	**Dan King** Sarah Lawrence College	(845) 365-0117 dking@sarahlawrence.edu
Chair (2012 – 2015)	**Jerry G. Ianni** LaGuardia Community College (CUNY)	(718) 482-5739 iannije@lagcc.cuny.edu
Chair-Elect (2012 – 2015)	**Elena Goloubeva** Webb Institute	(516) 671-2215 x111 egoloubeva@gmail.com
Secretary (2012 – 2015)	**Emad Alfar** Nassau Community College (SUNY)	(516) 572-7383 x 26865 Emad.Alfar@ncc.edu
Treasurer (2012 – 2015)	**Mohammad Javadi** Nassau Community College (SUNY)	(516) 572-7383 x 26882 javadim@ncc.edu
Vice-Chair for Four-Year Colleges (2012 – 2015)	**Janet Liou-Mark** NYC College of Technology (CUNY)	(718) 260-5929 jliou-mark@citytech.cuny.edu
Vice-Chair for Two-Year Colleges (2012 – 2015)	**Chia-Ling Lin** Nassau Community College (SUNY)	(516) 572-7383 x 26866 Chia-ling.Lin@ncc.edu
Vice-Chair for High Schools (2012 – 2015)	**Ken Gittelson** Benjamin Cardozo High School	(718) 279-6527 kgitt@optonline.net
Math Fair Chair – NYC	**Randy J. Asher** Brooklyn Technical High School	(718) 804–6500 rasher@schools.nyc.gov
Math Fair Chair – Long Island	**Joseph Quartararo** Northport-East Northport Public Schools	(631) 584-2016 cmleague@optonline.net
Speaker's Bureau Chair	**Dan King** Sarah Lawrence College	(845) 365-0117 dking@sarahlawrence.edu
Newsletter Editor	**Abraham S. Mantell** Nassau Community College (SUNY)	(516) 572-7383 x 26841 mantell@ncc.edu
Student Chapter Coordinator	**David Seppala-Holtzman** St. Joseph's College	(718) 636-7254 dholtzman@sjcny.edu
Public Relations Chair	**David Seppala-Holtzman** St. Joseph's College	(718) 636-7254 dholtzman@sjcny.edu
Book Exhibit Coordinator	**Elena Goloubeva** Webb Institute	(516) 671-2215 x111 egoloubeva@gmail.com
Liaison Coordinator and Webmaster	**Raymond N. Greenwell** Hofstra University	(516) 463-5573 matrng@hofstra.edu
Graph Theory Notes Liaisons	**John W. Kennedy,** Queens College **Louis V. Quintas,** Pace University **Daniel Gagliardi,** SUNY Canton	johnwken@gmail.com lquintas@pace.edu gagliardid@canton.edu
Section Archivist	**Agnes M. Kalemaris** Farmingdale State College (SUNY)	(631) 420-2217 kalemaam@farmingdale.edu

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Section Web Page – sections.maa.org/metrony

National Web Page – www.maa.org (both sites are linked to each other)

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Metropolitan New York Section of the MAA

Membership Count: 521 as of 25 March 2014

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MESSAGE FROM THE SECTION CHAIR

I would like to begin this message by thanking the team of section officers, committee chairs, and active members. One of the most comforting and enjoyable aspects that a section chair can experience is consistent support from a team of professional colleagues. I have been blessed to receive such support. It is my hope to maintain this camaraderie and to help ensure that section programming remains diverse, meaningful, and rewarding for the entire membership.

A joint meeting with the New Jersey Section is planned for Saturday, 1 November 2014, at St. Peter's College in Jersey City. The previous joint meeting in 2007 was well received by all, so I hope that many of you will be able to participate actively. It should be an exciting event! Please visit the section website over the next few months for updates.

Finally, I look forward to greeting all of you at the upcoming Annual Meeting on 3 May 2014 at Nassau Community College. We have three invited speakers giving accessible and informative talks: Linda Braddy, Ruth Charney, and Tim Chartier. Tim will also perform Mime-matics for us! Please look elsewhere in this newsletter for more details, and please visit the section website for updates. As always, I welcome your input and feedback on all section matters.

Jerry G. Ianni
Fiorello H. LaGuardia Community College (CUNY)

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MESSAGE FROM THE SECTION CHAIR-ELECT

Dear Metro New York Members and Friends,

The section appreciates you, needs you and is here for you. We need your help, your ideas, and your participation!

We encourage you to visit the MAA Metro NY Website to see what is happening. Contact section officers or committee chairs to seek more information and to share your ideas with them. Express your interest in committees or offices that become open on a regular basis, nominate colleagues who would be interested to make valuable contributions. We are constantly looking for opportunities to meet other mathematicians, to grow professionally and to improve the MAA Metropolitan Section program. Finally, if you would like to extend your participation in the MAA beyond the Section, we support and strongly encourage you to seek involvement in MAA at the state and national levels.

We cordially invite you to attend our Section meeting at Nassau Community College on May 3, 2014. Please consider giving a talk at this meeting. A Call for Papers, Meeting Registration Form, and Lodging &Directions are on our web page http://sections.maa.org/metrony/. Consider going to MAA MathFest in Portland, Oregon August 6-9, 2014. Come to the Joint Mathematics Meeting which will be held in San Antonio, Texas January 10-13, 2015. If you come to any of these meetings and see me, please feel free to come up and introduce yourself. Tell us about your concerns, suggestions and ideas. We will be happy to hear them.

I am grateful for the opportunity to serve as Chair-Elect of the Metropolitan NY Section of MAA, and to be a part of an amazing team of Section officers. I look forward to seeing you on May 3 at Nassau Community College.

Elena Goloubeva
Webb Institute

MESSAGE FROM THE SECTION GOVERNOR

Greetings Section members! I hope you have all coped well with this long, harsh winter. Of course, there's no better way to thaw out from all the winter bitterness than by attending a spring math conference. And the Metro New York Section just happens to be planning a great one for you! Section Chair Jerry Ianni and the Executive Committee are in the final planning stage for our spring meeting that promises to be even more dynamic and event-filled than those in recent years. Mark your calendars: the fun happens this year at Nassau Community College on Saturday, May 3. Details of the event – schedule, speakers, registration and transportation information – are included within the pages of this newsletter.

Did you know you can purchase MAA books at a hefty discount around the time of the spring meeting? Though book sale transactions will no longer occur at our spring meeting, MAA members will receive an email in the weeks preceding the spring meeting containing a special section meeting discount code for books purchased online. The MAA is providing a coupon code that provides *35% off book* purchases and is valid one week before and one week after your section meeting. So start making your wish list for summer reading!

The most recent Board of Governors (BoG) meeting was held at the Joint Mathematics Meetings in Baltimore on January 14, 2014. MAA President Bob Devaney (Boston University) presided over the meeting. Numerous important items were discussed over the daylong event.

MAA Executive Director Michael Pearson announced that no change is being proposed in membership dues and categories until at least 2015. If you recall, membership categories were restructured and simplified in 2013 in order to 'level the playing field' and equalize the amount people in different classes of membership pay for being a part of the MAA. This appears to have been a successful initiative as the new membership categories have received widespread praise.

Attendance at the most recent Joint Mathematics Meetings and MathFests have been quite robust, and a corresponding increase in submitted abstracts has been witnessed. Nearly 6,700 individuals attended the 2013 JMM in San Diego and 1,500 attended MathFest in Hartford. A new change to MathFest programs, initiated in Hartford, is to have an opening reception open to everybody (and included in the registration fee) rather than a special fee banquet. Here are the dates and locations of the upcoming national MAA meetings:
- MathFest, August 7-9, 2014, Portland, OR
- Joint Meetings, January 9, 2015, San Antonio, TX
- MathFest, August 4, 2015 (MAA Centennial), Washington, DC
- Joint Meetings, January 5, 2016, Seattle, WA
- MathFest, August 3, 2016, Columbus OH
- Joint Meetings, January 3, 2017, Atlanta, GA
- MathFest, August 2017, Chicago, IL
- Joint Meetings, January 9, 2018, San Diego, CA
- MathFest, August 2018, Denver, CO
- Joint Meetings, January 2019, Baltimore MD

The program for the 2014 MathFest in Portland (OR) is taking shape and will feature the following:
- The Hedrick Lecturer for 2014 is Bjorn Poonen, MIT.
- The Joint AMS-MAA Invited Address will be given by Sara Billey, University of Washington.
- Erika Camacho, Ricardo Cortez, and Keith Devlin have accepted the invitation to deliver MAA Invited Addresses.

- Joe Gallian, University of Minnesota Duluth, will give the Leitzel Lecture.
- Marie Vitulli, University of Oregon, will give the Falconer Lecture.
- Jack Graver, Syracuse University, will give the MAA Lecture for Students.
- Keith Devlin will give the Pi Mu Epsilon Frame Lecture.

Finally, be on the lookout soon for the revised Curriculum Guide of the MAA's Committee on the Undergraduate Program in Mathematics.

My term as section governor will end this July. At the time of writing this message, the election for the new governor is underway. I have no doubt that the Section will be well served by either of the two candidates, Abe Mantell or Farley Mawyer, standing for election. It has been my great pleasure serving the local mathematical community as governor. I joined the Section back in 1997 when I left Oberlin College to join the faculty at Sarah Lawrence College. My college is small, and I work within a two-person mathematics department. Fearing isolation in a small department from the greater mathematical community that exists in the Metro NY area, I decided to attend one of the Delegate Assembly meetings of the Section. At that meeting I encountered a room full of energetic mathematicians dedicated to providing support and high quality programming for local area mathematicians and their students. To be sure, in my work with the Section I found the community of mathematicians I was seeking and I made numerous connections that have served to considerably enrich my professional work over the last 17 years. I began my work with the Section very simply, as Speaker Bureau coordinator and as a member on various ad-hoc committees, before becoming Section secretary, chair and governor. Though my term as governor is swiftly coming to an end, I look forward to maintaining a presence in the Section as I continue to reap considerable benefits from the relationships I have developed with fellow officers and Section members. I say all of this in order to express my deep gratitude to all of the individuals of the Section with whom I have had the pleasure of interacting over the years. Peace and good heath to all of you.

Dan King, Sarah Lawrence College

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TREASURER'S REPORT
(As of 1/31/14)

Business Checking	$9,802.02
Business Money Market	$16,291.27
6-Month Business CD	$1,762.25
Total	$27,855.54

All accounts are with J.P. Morgan Chase Bank. Further details will be provided at the annual meeting.

Mohammad Javadi, Nassau Community College (SUNY)

25 and 50 Year Members

The following members will be recognized during the Awards Ceremony at our May meeting. The 25 year members are offered free registration, the 50 year members free registration *and* lunch (who said there's no such thing as a *free lunch*?!!). ☺

25 Years: Samer Habre (Lebanese American University), David Hankin, Edmund Healy, Martin Pincus, Gilbert Traub (Maritime College – SUNY), Perfecto Vazquez.

50 Years: Elliot Bird, Barry Cherkas (Hunter College – CUNY), Robert Dressler.

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2014 ANNUAL MEETING PROGRAM
Saturday, May 3
Nassau Community College (SUNY)
College Center Building (CCB)
Garden City, NY

8:15 – 9:25 AM	Registration and Refreshments Book Exhibits Open (continuing until 3:20 PM)
9:30 – 9:45 AM	Welcoming Remarks
9:45 – 10:35 AM	Invited Speaker: Tim Chartier, Davidson College *Mathematical Celebrity Look Alike**
10:35 – 10:45 AM	Break - coffee and refreshments
10:45 – 11:20 AM	Invited Speaker: Linda Braddy, Mathematical Association of America *You Should be a Math Major!**
11:20 – 11:40 AM	Awards Ceremony - including Prize Raffle with some Sectional Business
11:45 – 12:55 PM	Lunch (with time to visit the exhibits)
1:00 – 1:50 PM	Invited Speaker: Ruth Charney, Brandeis University *An Excursion into the Strange World of Singular Geometry**
1:50 – 2:00 PM	Break
2:00 – 3:00 PM	Special Presentation: Tim Chartier, Davidson College *Mime-matics Performance**
3:00 – 3:20 PM	Break
3:20 – 5:20 PM	Contributed Paper and Poster Sessions

* See pages 8-9 for Abstracts and brief Speaker Biographies

Presentation Abstracts and Speaker Biographies

Invited speaker: Tim Chartier, Davidson College: *Mathematical Celebrity Look Alike*

Abstract: Who is your celebrity look alike? LeBron James? Jackie Chan? Adele? Rihanna? Vectors norms enable us to discern what celebrity looks most like a selected individual. Linear algebra allows us to explore what linear combination of celebrity photos best approximates a selected photo. Would you describe yourself as a cross between Ben Stiller and Hugh Jackman or possibly Marilyn Monroe and Jennifer Aniston? In this talk, we learn how to answer this question using linear algebra and on the way get a sense of how math aids in facial recognition.

Biography: Tim Chartier is an Associate Professor in the Department of Mathematics and Computer Science at Davidson College. In 2014, he was named the inaugural Mathematical Association of America's Math Ambassador. He is a recipient of a national teaching award from the Mathematical Association of America. Published by Princeton University Press, Tim coauthored Numerical Methods: Design, Analysis, and Computer Implementation of Algorithms with Anne Greenbaum. As a researcher, Tim has worked with both Lawrence Livermore and Los Alamos National Laboratories on the development and analysis of computational methods targeted to increase efficiency and robustness of numerical simulation on the lab's supercomputers, which are among the fastest in the world. Tim's research with and beyond the labs was recognized with an Alfred P. Sloan Research Fellowship.

He serves on the Editorial Board for Math Horizons, a mathematics magazine of the Mathematical Association of America. He chairs the Advisory Council for the Museum of Mathematics, which opened in 2012 and is the first museum of mathematics in the United States. Tim has been a resource for a variety of media inquiries which includes fielding mathematical questions for the Sports Science program on ESPN. He also writes for the Science blog of the Huffington Post.

As an artist, Tim has trained at Le Centre du Silence mime school and Dell'Arte School of International Physical Theater. He also studied in master classes with Marcel Marceau. Tim has taught and performed mime throughout the United States and in national and international settings.

In his time apart from academia, Tim enjoys the performing arts, mountain biking, nature walks and hikes, and spending time with his family.

Mime-matics: In *Mime-matics*, Tim Chartier explores mathematical ideas through the art of mime. Whether creating an illusion of an invisible wall, wearing a mask covered with geometric shapes, or pulling on an invisible rope, Dr. Chartier delves into mathematical concepts such as estimation, tiling, and infinity. Through *Mime-matics*, audiences encounter math through the entertaining style of a performing artist who has performed at local, national, and international settings.

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Invited speaker: Linda Braddy, Deputy Executive Director, Mathematical Association of America: *You should be a math major!*

Abstract: Are you a faculty member who has ever said, "You should be a math major!" to a promising student who was majoring in another field or who was still undecided? What kind of answer did you get, and how did you respond? Are you a student who is considering further study in mathematics but are unsure if that would open as many doors of opportunity as other fields of study might? Lack of information about the lucrative job opportunities for someone with a degree in mathematics, particularly those outside the world of academia, is one reason why capable students don't choose mathematics as their major. In this talk, we will examine several of the non-academic careers available in mathematics.

Biography: Linda Braddy is Deputy Executive Director of the MAA and holds a Ph.D. in mathematics from the University of Oklahoma. Prior to joining the MAA in 2012, she served as dean of the Division of Mathematics and Natural Sciences at Tarrant County College (TCC) in Texas, and immediately prior to that as a tenured professor of mathematics and department chair at East Central University (ECU) in Oklahoma. During her tenure at ECU and subsequently at TCC, she acquired a combined $4.7 million in external funding for projects focused on improving student success in general education mathematics courses; providing research and summer enrichment programs for students; providing scholarship opportunities for students; and providing professional development programs for K-12 mathematics teachers. She currently oversees MAA grant-funded programs with combined budgets of $11 million, as well as the Meetings and Facilities Department, Project NExT (and is a 2001 fellow herself), the American Mathematics Competitions program, and MAA public policy efforts.

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Invited speaker: Ruth Charney, Brandeis University, Polya Lecturer: *An Excursion into the Strange World of Singular Geometry*

Abstract: In high school, we learn about the geometry of the plane. Later, we encounter the geometry of smooth manifolds. In this talk, we take a peek at the mind-bending geometry of singular spaces and their applications.

Biography: Ruth Charney is a Professor of Mathematics at Brandeis University and the President of the Association for Women in Mathematics. She is also a Fellow and a Trustee of the American Mathematical Society. She received her Ph.D. from Princeton and taught at Berkeley, Yale, and Ohio State Universities before returning to her undergraduate alma mater, Brandeis, in 2003. She was never sure whether she was a topologist or an algebraist, and is now happily immersed in geometric group theory, a combination of the two.

2014 METRO NY SECTION OF THE MAA MEETING REGISTRATION FORM
(* PLEASE PRINT ***)**

First Name: _____ M.I.: _____ Last Name: _____

Badge Name or Nickname: _____ Affiliation: _____

Address: _____

City: _____ State: _____ Zip+4: _____-_____

Phone Number: Day: (___)_____ E–mail: _____

Special diet? (circle one) Yes / No. Please specify: _____

Any other special needs? (wheelchair access, etc. – please specify) _____

The MAA national office requests the following information. Please check the appropriate responses.

Current MAA Member: ☐ Yes ☐ No   First Metro NY Section Meeting? ☐ Yes ☐ No

Faculty members at a college or university, please check the highest <u>mathematics</u> degree offered by your <u>current</u> institution: ☐ Associate   ☐ Bachelors   ☐ Masters   ☐ Doctorate   ☐ None

Current employment/student status (check all that apply):
☐ High School Student   ☐ Undergraduate Student   ☐ Graduate Student
☐ High School Teacher   ☐ College/University Professor ☐ Business, Industry, Government Employee
☐ Retired (from?) _____   ☐ Other (please specify) _____

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Registration Fee*: On/Before 18 April	$15.00	_____	* Registration and lunch fees waived for:
(<u>Postmarked</u>) After 18 April	$20.00	_____	• students presenting papers or posters
Student Registration	$ 5.00	_____	• *Exactly* 50-Year Members (see page 7)
Luncheon*? (circle one) Yes / No	$15.00	_____	* Registration fee waived for:
	TOTAL:		• *Exactly* 25-Year Members (see page 7)
		=======	

Important Note: On-site registration will be available (at the higher registration fee), but all members are encouraged to pre-register by mail as early as possible. Registration forms received on or after April 25 will not be processed in advance of the meeting. Luncheons are not guaranteed for attendees registering on-site.

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Mail completed form with payment payable to *The Metropolitan New York Section of the MAA*
(do not send cash) to:

Mohammad Javadi, MetroNY MAA Treasurer
Mathematics, Computer Science, and Information Technology
Nassau Community College
One Education Drive
Garden City, NY 11530-6793

Nassau Community College (SUNY)
College Center Building (CCB)
Garden City, NY 11530-6793

(Partial) Campus Map

*** IMPORTANT ***

Due to the LI Marathon, NCC Public Safety has informed us of the following.

Attendees should enter the NCC campus from the Stewart Avenue (i.e., the north) side of campus. Turn south from Stewart Ave onto Endo Blvd /Lifetime Brands Blvd. Pass the Chinese Buffett on your right-hand side, enter the NCC campus, make a right turn onto Miller Ave, continue straight on Miller Ave to the second stop sign (at the NCC Bookstore), make a left turn onto Duncan Ave, continue straight on Duncan Ave to the end of the football field, make a left turn onto Davis Ave, then immediately make a right turn, proceed through the gates (which will be in the up position), make a left turn at the stop sign and continue on to parking lot West 4B. This route is highlighted by the red dashed line on the map.

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The attendees can park as close to the CCB (which is located next to Building G) as they'd like, but they should park in student (i.e., non-restricted, non-faculty) parking spots.

For Directions, Full Campus Map, and Virtual Tour, visit:

http://www.ncc.edu/campusservices/parkingandsafety/mapanddirections.shtml

11

FEATURED ARTICLE

New York Math Circle – Math for Math's Sake?
by Japheth Wood, Bard College and Executive Director of the New York Math Circle

Last summer in July, 75 high school students enriched their math education at the New York Math Circle High School Summer Program. These were not summer school students forced to make up lost credit for poor performance during the school year, nor were they bent on accelerating their math studies to be able to take Calculus ever earlier, in search of college credit. No, these were highly-motivated students excited to study math for math's sake.

At the entry level class (imaginatively called "Level A"), twenty-five of the students from the program mastered modular arithmetic through the circuitous route of considering long division in different number bases. At the intermediate level (affectionately named "Level B"), students worked together to count challenging combinatorial configurations, and at the advanced level (you guessed it – "level C"), topics included projective geometry and later the theory of equations. The following two weeks brought additional topics, each rarely encountered in the school curriculum, even at New York City's most prestigious schools.

The program, now heading into its 6th summer has been named an Epsilon Program by the American Mathematical Society for the second year in a row, recognizing its excellence in igniting youthful passion for these future mathematicians, programmers, scientists and engineers. This recognition brings with it some funding that goes toward need-based scholarships for about 24% of the students, including the Ky and Yu-Fen Fan Scholarship and the Robert H. Oehmke Scholarship, both named for world-class mathematicians who saw the need to support our "epsilons." Math for America also provided some support to several NY Math Circle students, each with financial need and an MfA master teacher sponsor.

New York Math Circle executive director Japheth Wood notes that the program is very low cost for all the students, and this is one of the goals. "Thanks to the support of the Courant Institute (which provides classroom space as an in-kind donation), other organizations, and private donations, we are able to lower the barrier to high quality math enrichment to all our students. We charge an order of magnitude less than other high-quality academic programs. We work hard to provide a math program that we would have loved to attend as students, back when we got our start in mathematical thinking – real mathematics, including proofs. Our instructors are some of the best around. They really know their stuff. They have decades of teaching experience, over a century combined between the three lead instructors, and every one of the TAs is amazing." The program also provides a nourishing lunch each day, and students are usually treated to a tour of Google's NYC headquarters the day after the program ends.

But the New York Math Circle is more than just the Summer High School Program. During the school year, NYMC offers over ten math enrichment classes for middle school and high school students. Most of the math circle classes are hosted at NYU's Courant Institute, but a few are taught at Queens College, where NYMC is seeking to expand its offerings. Instructors use challenging problems as a means to focus and engage students on the subtle details needed to develop their deep understanding of the topics at hand. Most NYMC instructors have a background as school math teachers, while some hail from academia. Each has an extensive knowledge of the mathematical problem literature, and has honed her or his pedagogical skills working with highly motivated and capable math students.

Director Japheth Wood observes that there is demand yet to be filled. "Our students want a challenge beyond school, and our student classes fill up quickly. Most classes have long waiting lists. In the short time since our start in 2007, we've grown from nothing to working with over 200 students each weekend. We're continuing to expand as quickly as we can without compromising our top quality."

New York Math Circle also features teacher programming. The entry-level course, "Math Enrichment for Teachers" was featured in the New York Times article "Where Math Teachers Go to Get Energized" in 2012, and attracts both Middle School and High School math teachers who seek to develop their own content knowledge and to enrich their classroom teaching.

Another popular teacher program is the NYMC Teachers' Math Circle, a math and dinner series which receives partial funding from the American Institute of Mathematics. Wood says that "this is one our few free programs (but none are at all costly) and we see this as something like a departmental seminar for teachers. We enjoy dinner together along with the mathematics." If any readers of this newsletter are interested in giving a talk, please get in touch. These and other offerings for teachers can be found on the website nymathcircle.org/teachers.

Not surprisingly the New York Math Circle regularly attracts students from Westchester County (as well as New Jersey and Long Island), and some were among the students who founded the Westchester Area Math Circle, now hosted at Manhattanville College. Another active math circle in our MAA section is the Bard Math Circle in the Mid-Hudson Valley, also run by Japheth Wood.

The MAA actively supports math circles through the MAA Special Interest Group on Math Circles for Student and Teachers (SIGMAA-MCST). MAA members who are interested in supporting the math circle movement can join SIGMAA-MCST as well as connecting directly to our local math circles.

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BOOK REVIEW

Love and Math: The Heart of Hidden Reality by Edward Frenkel
Review by Jenifer Hummer, New York City Department of Education

$$\exists \, \text{Love} \in \text{Math} \longleftrightarrow \forall \, \text{Math} \in \text{Love}$$

The words "love and math" are seldom heard in the same sentence. As a mathematics educator, I came to a point where I dreaded telling people that I taught high school mathematics, because I did not want to hear another horror story about how much people hate mathematics or how they never had a good mathematics teacher. On the opposite extreme I would hear exclamations of awe as though one has to be granted magical powers in order to understand mathematics. This is among the reasons why Dr. Edward Frenkel caught my attention with the title of his recent book.

As a young Jew growing up in Soviet Russia, Frenkel's first love was physics. Yet, thanks to a mathematics professor, he was quickly converted. Once the beauty of mathematics captivated him there was no turning back. Frenkel's love affair with mathematics did not start off easily though. Unfortunately as a Jew at the time, it was as though Frenkel was a Montague and mathematics was a Capulet in a time when communism had been leading them in a families' feud for decades. Thankfully, no one had to die in this story, but like Romeo, Frenkel was not going to let politics stand in the way of being with his true love.

According to Frenkel he was an average teenage boy with many interests—especially physics. It was his love of physics and an interest in something a little quarky (pun intended), that first opened his eyes to the beauty of mathematics. A family friend introduced him to a symmetry group that explained the properties of quarks, and he was instantly enamored. He continued to study secretly with his family friend and had a major letdown when he was thuggishly excluded from acceptance into Moscow State University, because of his Jewish last name. Despite a few obstacles, Frenkel went on to make such a name for himself, he was invited as a visiting professor to Harvard at the age of 21. His autobiography detailing all of this and more is written in such a manner that I felt as though I was reading an entertaining novel—I didn't want to put it down.

Frenkel not only gives an adventurous account of his love affair with mathematics, he introduces the beauty of mathematics to the intellectual consumer. Frenkel mainly discusses the fields of mathematics within his research specialties, but they are intriguing enough that they may spark an interest in mathematics in general. He briefly discusses topics such as symmetry and groups in such a way that an average high school student could understand (and some gifted K-8 students). For the most part Frenkel does a great job explaining abstract ideas to any educated reader. However, there are some sticky mathematics in some of the chapters. If one takes heed to *A Guide for the Reader*, and skips the recommended chapters, that will save anyone with only an average knowledge of mathematics any disillusionment.

After reading his ideas about the injustice done to mathematics in school, I began to question what the implications of his ideas may have on the future of education. With the Common Core State Standards being pushed into most schools in the United States, there is already a movement to increase rigor in mathematics curricula. The CCSS instructional shifts and mathematical practices have been happening in excellent mathematics classrooms for decades. However, the standards themselves seem to ask students to engage in higher level mathematics at an earlier age than most students in the United States are used to seeing. Yet, I sense that Frenkel is suggesting that we take it a step further.

Frenkel asks "What if at school you had to take an art class in which you were only taught how to paint a fence? What if you were never shown the paintings of Leonardo da Vinci and Picasso? Would that make you appreciate art? Would you want to learn more about it?" What if we leave behind the "paint the fence" mathematics in order to increase an interest in mathematics for students? What would this look like? Imagine small children learning about the symmetries of a snowflake while they are making their classroom holiday decorations. Imagine co-curricular mathematics and art projects that reveal the true beauty of mathematics instead of focusing on boring algorithms and formulas that most people will never use once they graduate from high school. The understanding of modern mathematics is key to the future of science and technology. Yet most people never know modern mathematics exist, because they lose interest in mathematics long before they get to post-secondary education. If more students were exposed to the beauty of mathematics at a younger age, this could greatly increase advanced mathematical, scientific, medical, and technological discoveries.

Frenkel's goal is clearly to share his love of mathematics with the general public and persuade others that they too can love mathematics. There are also strong implications that mathematics education needs serious reform if we are going to change the culture and beliefs towards mathematics in this country. The book inspired me, an amateur mathematician. I had not studied advanced mathematics since my first graduate degree several years ago, and this book had me digging old mathematics books out of storage in the basement. It also had me feeling guilty for putting them there, like I had been ignoring one of the most important parts of my life. It also reignited my passion for mathematics education research. His most approving audience will most likely be intellectual readers or those who already have an interest in mathematics. While the mathematics in the book might be a little heavy for the average consumer, this book just may be the first small step to mathematicians taking over the world.

HUMOR

Lucky Larry
by Raymond N. Greenwell, Hofstra University

Suppose that X is a uniform random variable on the interval $[a, b]$. Derive the formula for the mean.

Solution:
Start with the Pythagorean Theorem.
$$a^2 + b^2 = c^2$$
Multiply both sides by m.
$$ma^2 + mb^2 = mc^2$$
Use the formula from general relativity $E = mc^2$.
$$ma^2 + mb^2 = E$$
Factor out the m.
$$m(a^2 + b^2) = E$$
Use the formula for the slope $m = \frac{\Delta y}{\Delta x}$.
$$\frac{\Delta y}{\Delta x}(a^2 + b^2) = E$$
Cancel the 's.
$$\frac{y}{x}(a^2 + b^2) = E$$
Cross multiply.
$$y(a^2 + b^2) = Ex$$
Use $\sim = Ex$.
$$\sim = y(a^2 + b^2)$$
Use the equation for a line.
$$y = mx + b$$
Use the equation for a line perpendicular to the last line.
$$y = -mx + a$$
Add the last two equations together.
$$2y = a + b$$
$$2y - (a + b) = 0$$
$$y = \frac{1}{2(a + b)}$$
Substitute into the equation for $\sim$.
$$\sim = \frac{1}{2(a + b)} \cdot (a^2 + b^2)$$
Cancel.
$$\sim = \frac{a + b}{2}$$

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CALL FOR PARTICIPANTS AND INVOLVEMENT

Go Back to School, Join *The Mathematics Speakers Bureau!!!*

Do you have a talk which would be suitable for local area students or their faculty? We are seeking mathematicians interested in sharing their knowledge, enthusiasm, and love of mathematics. Now in its 52nd year, the Mathematics Speakers Bureau (MSB) is composed of dedicated mathematicians who volunteer to speak to students and faculty of regional middle schools, high schools, colleges and universities on topics reaching beyond the traditional mathematics curriculum.

The primary goals of the MSB are to stimulate the interests of local youth in mathematics, to provide opportunities for students to meet active and enthusiastic mathematicians, to motivate students towards careers in the mathematical sciences, and to encourage cooperation between corporate and academic institutions in the mathematical education of area youth. Volunteers provide information about talks they are willing to give and the Bureau, in turn, advertises these talks to the faculty of local area schools. Schools contact speaker volunteers directly to make specific arrangements for a visit. Volunteers determine the number of presentations they give in any given academic year and always maintain the right to decline any invitation to speak. The Bureau web-page (www.maa.org/metrony/speakers) contains an up-to-date listing of available speakers and their proposed talks. Additional information regarding the goals, history and operation of the Bureau can also be found at this site. If you wish to volunteer with the MSB, please contact Bureau Chair Abe Mantell at mantell@ncc.edu.

MetroMath Needs You!!!

Consider submitting a short announcement, commentary, article, study, experience, or other newsworthy item in the next issue of *MetroMath*. Contact the editor, Abe Mantell, via e-mail: mantell@ncc.edu.

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MATH IN THE NEWS FROM THE MAA
(much more can be found at: http://www.maa.org/news and http://mathdl.maa.org)

Math Narrows the Search

Rachel Thomas explains in *Plus* how mathematics and statistics have aided in the search for missing planes. She describes how London-based satellite communications company Inmarsat narrowed the search for Malaysia Airlines flight MH370 by mathematically analyzing satellite signals from the plane and explains how a strategy based on Bayesian statistics was used to locate the black box recorder from Air France flight AF447. Read the full story at: http://plus.maths.org/content/searching-answers

May the Power of Math be with You

New Jersey Institute of Technology mathematics professor Bruce Bukiet has released his 2014 Major League Baseball projections. Bukiet's mathematical model, which has been published in *Operations Research*, can be used to predict the number of games a team will win, the optimal batting order for a set of nine batters, and how trading players will influence how many games a team wins. Bukiet publicizes his annual projections to make a point about mathematics: *I publish these to promote the power and relevance of math. Applying mathematical models to things that people care about or enjoy, like baseball, shows that math can be fun as well as very useful.*
Read the full story at: http://www.njit.edu/news/2014/2014-096.php

How Computers Spend the Weekend

A team at Indiana State University is harnessing ISU's computing power to search for the largest prime numbers, the largest twin primes, and the largest Sophie Germain primes (primes of the form p and $2p$+1). A project involving Geoff Exoo, professor of mathematics and computer science, Jeff Kinne, assistant professor of computer science, and a handful of students uses 75 computers full-time and another 75 part-time on weekends and holidays. Over winter break the search yielded the 14th largest pair of twin primes. Kinne notes that the quest for large primes has practical relevance due to their use in online encryption. "In another 20 years, computers will be faster, and you'll need larger numbers," he says. Read the full story at: http://phys.org/news/2014-03-mathematicians-rare-prime.html

Stand-up Math(s)

New Scientist deems Matt Parker's gig—he's a "stand-up mathematician"—a "dream job." With a degree in applied mathematics and experience teaching math in the UK, Parker finds in math(s)-based stand-up comedy the best of both worlds. "It involves all the best bits of teaching and all the best bits of stand-up," he says. Parker's material can be found on the internet, but interested parties should know that the stand-up mathematician will be touring the United States in November with a set that includes a mind-bending demonstration of four-dimensional shapes.
Read the full story at: http://www.newscientist.com/article/dn25295-dream-job-standup-mathematician.html

Math Projects Make Strong Showing in Intel Science Talent Search

Mathematics projects earned the second and third place honors in the Intel Science Talent Search, the nation's most prestigious pre-college science and math competition. Kevin Lee, 17, of Irvine, California, won second place and $75,000 for developing a mathematical model to describe the shape of the heart as it beats using the principles of fluid mechanics, while William Henry Kuszmaul, 17, of Lexington, Massachusetts, won third place and $50,000 for devising a new approach to the mathematics of modular enumeration.
Read the full story at: https://www.societyforscience.org/press-release-intel-sts-2014-winners

The Genetics of Math Anxiety

A new study in the *Journal of Child Psychology and Psychiatry* finds that math anxiety cannot be blamed solely on negative experiences with the subject, but also has a genetic component. The study, conducted by researchers at Ohio State University, looked at assessments of math anxiety, general anxiety, math problem solving, and reading comprehension taken by 216 identical twins and 298 same-sex fraternal twins. It found that genetic factors explained about 40 percent of the individual differences in math anxiety. Principal investigator Stephen Petrill says that he and his team are currently using EEGs to measure the real-time brain activity associated with the anxiety responses during math and non-math problem solving. "If we can get a better idea of what provokes this anxiety response," he said, "we may be able to develop a better intervention for those with math anxiety."
Read the full story at: http://www.sciencedaily.com/releases/2014/03/140317095843.htm

AWM's Ruth Charney on Engaging More Women in Mathematics

The *Christian Science Monitor* talked to Ruth Charney, president of the Association for Women in Mathematics (AWM), about ways to get more girls into math. Charney recommended Math Circles, summer programs, *Numberphile* videos, and making mathematics more about problem-solving and collaboration than calculation and competition. "I think the way to go when talking to children is to show that math is really about puzzle solving, not just doing some rote equations," Charney says. "Too often, it just becomes a competition to see who can solve an equation the fastest." Read the full story at:
http://www.csmonitor.com/The-Culture/Family/Modern-Parenthood/2014/0314/Calculating-women-How-to-get-more-girls-into-math

How to Raise a Math Whiz

As part of a *Washington Post* series called "Raising a Math Whiz," Mari-Jane Williams offers parents suggestions for how to inspire their kids to love math. A mother and math-eschewing English major, Williams picks the brains of several women involved in efforts to engage children —and their parents— in math. The resulting recommendations include:

1. Never say you weren't good at math (even if you weren't).
2. Celebrate a mathematician.
3. Teach them that struggling is okay.
4. Adopt a more math-centric vocabulary.
5. Weave math into everyday activities.
6. Let them be the experts.

Read the full story at:
http://www.washingtonpost.com/lifestyle/how-to-get-reluctant-children-to-embrace-math/2014/03/04/4be99e46-959d-11e3-8461-8a24c7bf0653_story.html

March (Mo)Mathness Educates a Crop of Bracketologists

The *New York Times* reported on a seminar Davidson College mathematician Tim Chartier conducted at the National Museum of Mathematics in which he coached attendees in the use of linear algebra to predict the outcome of the NCAA Basketball Tournament. Interest in the event was fueled not only by the success Chartier and his students have had with their math-assisted brackets, but also by the $1 billion Warren Buffett and Quicken Loans are offering anyone who correctly predicts all 63 of the tournament's wins. Read the full story at:
http://www.nytimes.com/2014/03/16/sports/ncaabasketball/mathematicians-are-hoping-their-calculations-add-up-to-the-perfect-bracket.html

Play First; Formalize Later

Writing in *The Atlantic*, Luba Vangelova describes math educator and curriculum designer Maria Droujkova's place in a movement aiming to change how mathematics is taught. Droujkova claims that the mathematical tasks required of young students are often not developmentally appropriate for them, and instead advocates a more holistic approach she calls "natural mathematics." Droujkova wants to channel children's inborn impulse to play toward the exploration of mathematics. In Droujkova's model, students would progress from play to informal discussion of concepts to eventual formalization. An element of playfulness would ideally remain throughout, however. "This is what mathematicians do—they play with abstract ideas, but they still play," Droujkova says.

Read the full story at: http://www.theatlantic.com/education/archive/2014/03/5-year-olds-can-learn-calculus/284124/

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Abe Mantell, Editor
MAA *MetroMath*
Department of Mathematics,
Computer Science, and Information Technology
Nassau Community College
Garden City, NY 11530-6793