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MetroMath

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Newsletter

Metropolitan New York Section of
The Mathematical Association of America

April 2015



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ANNUAL MEETING

Sunday, 3 May 2015
8:30 AM – 5:40 PM

New York City College of Technology (CUNY)
Brooklyn, NY

(More Information Contained Within)

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SECTION OFFICERS

Governor (2014 – 2017)	Abraham S. Mantell Nassau Community College (SUNY)	(516) 572-7383 x 26841 mantell@ncc.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@webb.edu
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 Gittelsohn 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 gagliardi@d.canton.edu
Section Archivist	Agnes M. Kalemari 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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Membership Count: 519 as of 23 February 2015



MESSAGE FROM THE SECTION CHAIR

During the upcoming Annual Meeting on 3 May 2015 at New York City College of Technology, my term as Section Chair will come to an end. It has truly been an honor and a pleasure to serve in this capacity. The team of section officers, committee chairs, and active members has provided extensive support and an ample supply of practical wisdom. The experience has been one of the most rewarding in my professional career. I offer the incoming Section Chair, Elena Golubeva, my best wishes for a wonderful term over the next three years!

2015 is also a milestone year for our national organization (MAA) as it commemorates its centennial. Over the first one hundred years, the MAA has established a tradition of fostering grassroots mathematical activity and development and promoting public awareness. To recognize and nurture this tradition, the Metro NY Section will award centennial celebration mini-grants to offer partial support for activities conducted in the Section during the late Spring, Summer, and Fall of 2015. Please look elsewhere (page 13) in this newsletter or on the Section website for more details and instructions on how to apply for a mini-grant.

Finally, I am pleased to report that the joint meeting with the New Jersey Section on 1 November 2014 at St. Peter's University was well received by all. I look forward to greeting all of you at the upcoming Annual Meeting on May 3. We have an exciting program in development with invited talks by Marjorie Senechal and Judy L. Walker as well as many other activities. Let's continue the work of the MAA here in the Metropolitan New York area as we embrace the challenges and opportunities that arise over the next hundred years!

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 NY Metro website and see what is happening. Contact section officers or committee chairs to seek more information and to share ideas with them. Express your interest in committees or offices that become open on an annual basis, nominate colleagues who would be interested and can make a valuable contribution if they thought they were needed. 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 New York City College of Technology on May 3 2015. 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 coming to MAA MathFest at Washington, DC on August 5-8. We hope you can join us for our much anticipated Centennial Celebration!

Come to the Joint Mathematics Meeting in Seattle on January 6-9, 2016.

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 New York City College of Technology.

Elena Goloubeva, Webb Institute

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MESSAGE FROM THE SECTION GOVERNOR

Hello Metro NY Section Members,

The following is my report of the two most recent Board of Governors (BoG) Meetings of the MAA. The first was held at MathFest on 6 August 2014 in Portland, Oregon; and the second at the JMM on 9 January 2015 in San Antonio, Texas. I include only those items most relevant, or of interest, to MAA members in the Metro NY Section.

BoG at MathFest 2014

The MAA received a donation of \$750,000 from the Simons Foundation to support the competitions programs. Simons has agreed to be pay the amount over a three year period, with \$250,000 already received by the MAA in 2014. The 2015 budget was presented, and approved by the Board. The new budget includes a deficit of about \$98,000 (compared to a \$294,800 deficit for 2014).

The International Mathematical Olympic (IMO) US team won five gold medals and one silver, which tied them with China in terms of medal count. The US team was second to China in point count. This is the tenth year the US team finished in the top three.

The MAA is no longer part of the American Mathematical Society's (AMS) Combined Membership List (CML - <http://www.ams.org/cml>). The primary reason is that the CML is not connected to any databases. The MAA has their own membership look-up, accessible by members, that is structured for us and includes committee memberships. Members may opt out of being looked-up.

The Committee on Undergraduate Programs in Mathematics (CUPM) is in the final stages of the draft of the revision to the *2004 CUPM Curriculum Guide*, namely the *2015 CUPM Curriculum Guide to Majors in the Mathematical Sciences*. The BoG approved supporting the principles of the 2004 guide and the "cognitive content recommendations" for the 2015 guide as presented by the CUPM.

This was the largest MathFest ever, with total attendance reaching 1651!

(continued)

BoG at JMM 2015

This year marks the centennial of the MAA. As such, efforts have been underway seeking donations for the "Second Century Campaign." While this campaign officially began on 1 January 2012, it was publicly launched at MathFest 2014. The campaign is a five-year plan to raise \$7 million. "This campaign will support MAA's strategic plan that was unanimously adopted by the Executive Committee in 2012," says MAA President, Bob Devaney. "The plan is an investment in our vision, developed over our first century, of being the leading professional association in collegiate mathematics, the preeminent publisher of expository mathematics, the primary source of professional development programs for faculty, and the number one provider of resources for teaching and learning." To date, over \$3.9 million has been raised toward this goal. Donations can be made via the MAA website: <https://www.maa.org/donate>.

Actual budget figures for 2014 were presented, showing the deficit to be about \$545,000, roughly \$250,000 more than expected. The primary reasons for this was due to an overly optimistic outlook with regard to revenue from books and journals, as well as expenses for the American Mathematics Competitions (AMC) move that were planned for 2013 which occurred in 2014. Please encourage your colleagues to consider MAA published textbooks for classroom adoption. There are many fine choices available, most of which are substantially less expensive than similar titles from the major publishers.

The following membership dues starting in 2016 were approved by the Board:

- Member plus: \$249
- Member: \$175 if paid as a lump sum (this is an increase from \$169) or \$180 with monthly installments of \$15 (this is not an increase from the current monthly rate)
- Student: \$35

This represents an increase (of \$6) in only one category for individual membership. The most significant change will be to Departmental Membership. These memberships will be offered with six price points based on total enrollment at the institution and whether or not the mathematics department is Ph.D. granting. Here is the breakdown:

	Total Institutional Enrollment		
Ph.D.?	< 7,000	7,000 – 19,999	≥ 20,000
No	\$ 500	\$ 700	\$ 900
Yes	\$ 750	\$ 1,000	\$ 1,500

The primary change to this member category is that the department may now nominate as many student members as it would like, at no additional cost. It is hoped that this new structure will engage more students, who will then realize the benefits of membership. The department will receive a full MAA membership, and students will receive full student membership in the MAA. The department will also enjoy significant discounts on WeBWork hosting. All instructors using WeBWork will pay only \$200 per course (a savings of \$100 per course). Efforts are being made to increase international memberships. Membership dues account for about 15% of MAA revenue.

The MAA's Carriage House recently received national recognition (*Winner of Best Awards 2014*, by *Unique Venues Magazine*) as a modern meeting space in a classic setting. The MAA is confident it will soon be a source of revenue as its use increases by outside organizations. It is currently in use only about 17% of the time.

The centennial celebration at MathFest 2015, in development for the past eleven years, will be showcased in a variety of ways. Some of these ways are, a centennial banner that will be on display in the main lecture hall, the publication of a special centennial volume, an extra day of events (four days rather than the usual three), and links to centennial videos from each Section. Look for a special insert with more information in the April 2015 issue of *MAA Focus*. Check the MAA webpage for more details.

The Committee on Undergraduate Programs in Mathematics (CUPM) has completed its draft of the *2015 CUPM Curriculum Guide to Majors in the Mathematical Sciences*. It is available via the MAA webpage. It was noted that the guide is not a mandate, but rather a guideline. The CUPM plans to update this guide every one or two years. A PowerPoint presentation about the guide will be available for section meetings as well as individual departments.

This JMM had a total of 5999 attendees.

Here are the dates and locations of the upcoming national MAA meetings:

- MathFest, 5-8 August 2015 (MAA Centennial), Washington, DC
- Joint Meetings, 6-9 January 2016, Seattle, WA
- MathFest, 3-6 August 2016, Columbus OH
- Joint Meetings, 4-7 January 2017, Atlanta, GA
- MathFest, 26-29 July 2017, Chicago, IL
- Joint Meetings, 10-13 January 2018, San Diego, CA
- MathFest, 1-4 August 2018, Denver, CO
- Joint Meetings, 16-19 January 2019, Baltimore MD
- MathFest, 31 July - 3 August 2019, Cincinnati, OH
- Joint Meetings, 2020: Denver, Phoenix, and San Antonio are under consideration.
- Joint Meetings, 6-9 January 2021, Washington, DC

I hope to see many of you at both the Metro NY Section Meeting on May 3rd at the New York City College of Technology, and at MathFest in August in Washington, DC.

Abe Mantell, Nassau Community College

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TREASURER'S REPORT

(As of 2/27/15)

Business Checking	\$10,797.73
Business Money Market	\$13,304.80
<u>6-Month Business CD</u>	<u>\$ 1,762.90</u>
Total	\$25,865.43

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

Mohammad Javadi, Nassau Community College (SUNY)

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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: Philip Cobb, Daniel Goroff (Alfred P. Sloan Foundation), Rony Gouraige, Samer Habre (Lebanese American University), Steven Jaffe, Russell Miller (Queens College - CUNY), Anthony Weidner.

50 Years: Lawrence Cohen (Nassau CC - SUNY), Miriam Grosop (Yeshiva University, James Peters (Long Island University - Post), Laurence Winer (Arizona State University), John Winn (Farmingdale State College - SUNY).

2015 ANNUAL MEETING PROGRAM
Sunday, May 3
New York City College of Technology (CUNY)
Namm and Atrium Buildings
300 Jay Street
Brooklyn, NY 11201

8:30 – 9:25 AM	Registration and Refreshments Book Exhibits Open (continuing until 3:40 PM)
9:45 – 10:00 AM	Welcoming Remarks
10:00 – 10:50 AM	Invited Speaker: Marjorie Senechal, Smith College and <i>The Mathematical Intelligencer</i> <i>Monsters, Penrose Tilings, and Aperiodic Crystals*</i>
10:50 – 11:00 AM	Break - coffee and refreshments
11:00 – 11:50 AM	Concurrent Sessions 1. <i>NSF Grants Presentation</i> , Jennifer Slimowitz Pearl 2. <i>National MAA Math Major Presentation (CUPM)</i> 3. <i>Math Bowl (for students)</i>
12:00 – 1:20 PM	Lunch (with time to visit the exhibits)
1:30 – 2:10 PM	Awards Ceremony and Business Meeting
2:15 – 3:25 PM	Invited Speaker: Judy Walker, University of Nebraska - Lincoln <i>What Color is My Hat, and What Does That Have to with My iPad?*</i>
3:40 – 5:40 PM	Contributed Paper and Poster Sessions

* See pages 9-10 for Abstracts and brief Speaker Biographies



Presentation Abstracts and Speaker Biographies



Invited speaker: Marjorie Senechal, Smith College and *The Mathematical Intelligencer*

Title: *Monsters, Penrose Tilings, and Aperiodic Crystals*

Abstract: Regular pentagons don't tile the plane, as Johannes Kepler discovered long ago. The gaps didn't bother him but overlaps did; they're monsters, he said, and quit. 350 years later Roger Penrose took another look and came up with his now-famous aperiodic tiles. Are Penrose tilings more than intriguing toys? Are they, as many people hoped, also found in nature? Do they describe the atomic structures of real aperiodic crystals (so-called quasicrystals)? In this talk I'll show why many people hoped the Penrose tilings would do that job, but Kepler's monsters do it better.

Biography: Marjorie Senechal grew up in Lexington, Kentucky, and received a B.S. from the University of Chicago and M. S. and Ph.D. degrees from the Illinois Institute of Technology, all in mathematics, and taught at Smith College throughout her career.

Now Marjorie is the Louise Wolff Kahn Professor Emerita in Mathematics and History of Science and Technology at Smith College, Northampton, MA, and editor-in-chief of the international quarterly journal, *The Mathematical Intelligencer*. She is a Fellow of the American Mathematical Society.

Her latest books are "I Died for Beauty: Dorothy Wrinch and the Cultures of Science (OUP)," and "Shaping Space: Exploring Polyhedra in Nature, Art, and the Geometrical Imagination (Springer)," both 2013. Earlier books include "Crystalline Symmetries, Quasicrystals and Geometry," "Long Life to Your Children! A Portrait of High Albania (with Stan Sherer)," and "American Silk, 1830-1930" (with Jacqueline Field and Madelyn Shaw).



Invited speaker: Judy L. Walker, Aaron Douglas Professor, Chair of the Department of Mathematics, University of Nebraska - Lincoln

Title: *What color is my hat, and what does that have to do with my iPod?*

Abstract: As each of three people enter a room, either a blue hat or a white hat (with the color chosen randomly and independently) is placed on his or her head. Each person can see the other hats but not their own. They can discuss strategy before they enter the room, but after they've entered no communication is allowed. Once they've looked at the other hats, the players must simultaneously guess their own hat colors or pass. The group shares a prize if at least one person guesses correctly and no one guesses incorrectly. The "obvious" strategy (one person guesses "Blue" no matter what and the other two pass) yields a 50% success rate. Is there a better strategy? What if there are more than three players? We will use the theory of error-correcting codes to find the optimal strategy for this game in many situations.

(continued)

Biography: Judy Walker received her undergraduate degree from the University of Michigan and both her master's degree and her Ph.D. from the University of Illinois at Urbana-Champaign. She has been at the University of Nebraska Lincoln since 1996, and currently serves as Aaron Douglas Professor and Chair of the Department of Mathematics there. Her research is in algebraic coding theory and she is author of the book "Codes and Curves" published by the AMS as part of their Student Mathematical Library. She spent much of the fall 2011 semester as a Visiting Professor at Centre Interfacultaire Bernoulli, EPFL in Lausanne, Switzerland.

Dr. Walker is a co-founder of the Nebraska Conference for Undergraduate Women in Mathematics and has served as an elected member of the AWM Executive Committee and the AMS Council. She was the lecturer for the undergraduate portion of the IAS/PCMI Mentoring Program for Women in 1999 and was one of three lecturers at the 2007 Summer School in Coding Theory at the Sophus Lie Conference Center, Nordfjordeid, Norway. She has won several teaching awards, including the University of Nebraska's system wide Outstanding Teaching and Instructional Creativity Award in 2014 and the MAA's Deborah and Franklin Tepper Haimo Award in 2006. She served as the MAA's Polya Lecturer for 2009-2011.



Presenter: Jennifer Slimowitz Pearl, Program Director in the Division of Mathematical Sciences at the National Science Foundation

Title: *National Science Foundation: Organization, Programs, and Tips*

Abstract: This presentation will give an overview of NSF, opportunities for faculty and students, and tips for writing strong proposals. There will be plenty of time for discussion.

Biography: Jennifer Slimowitz Pearl is a Program Director in the Division of Mathematical Sciences at the National Science Foundation. She manages the DMS Infrastructure program and is active in NSF's efforts to support the training of students and postdoctoral researchers in the mathematical sciences. She recently completed an assignment in the Office of the Assistant Director in NSF's Directorate of Mathematical and Physical Sciences, examining partnerships between NSF and non-profit funders of basic research in MPS disciplines. She was formerly a Program Director in NSF's Office of International Science and Engineering. Dr. Pearl has held positions at the National Academies and at Rice University. She was an AAAS/NSF Science and Technology Policy Fellow and was awarded a NSF/NATO Postdoctoral Fellowship to conduct research at the Université du Québec à Montréal. Dr. Pearl earned her Ph.D. in mathematics specializing in symplectic geometry from the State University of New York at Stony Brook and her B.S. in mathematics from Duke University.



2015 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 mathematics degree offered by your current 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) _____

2.3025850929940456840179914546843642076011014886287729760333279009675726096773524802359972050895982983419677840422862486334095254650828067566662873690987816894829072083255546808437998948262331985283938

Registration Fee*: On/Before 17 April \$15.00 _____

(Postmarked) After 17 April \$20.00 _____

Student Registration \$ 5.00 _____

Luncheon*? (circle one) Yes / No \$15.00 _____

TOTAL: _____

=====

* Registration and lunch fees waived for:
• students presenting papers or posters
• *Exactly* 50-Year Members (see page 8)

* Registration fee waived for:
• *Exactly* 25-Year Members (see page 8)

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 24 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

**New York City College of Technology (CUNY)
Namm and Atrium Buildings
300 Jay Street
Brooklyn, NY 11201**



Directions: <http://www.citytech.cuny.edu/aboutus/contactus.shtml>
Parking: <https://www.parkme.com/map?lat=40.69555&lng=-73.987137>

Call For Proposals for MAA Centennial Celebration Mini-Grants

The Metropolitan New York Section is pleased to announce that it will award a few mini-grants ranging between \$200 and \$500 each to offer partial support for activities conducted in the Metro NY Section during the late Spring, Summer, and Fall of 2015 to promote the Centennial of the Mathematical Association of America (MAA). The funds could be used to provide refreshments and/or to offer an honorarium and/or partial expense reimbursement for a guest speaker in a half-day conference, for example.

The MAA has a tradition of fostering grassroots mathematical activity and development and promoting public awareness. In keeping with this tradition, the funds should only be used to offer partial support for events that are explicitly advertised to at least three institutions within the Metro NY Section and which offer activities that are accessible to a broad mathematical audience.

To apply for a mini-grant, submit a proposal that includes a title, abstract, and 400-word description of the event, how it will be advertised and promoted, and an itemized budget. Each proposal will be reviewed by the Executive Committee on a rolling basis when it is received throughout the remainder of 2015. The proposal should be submitted to Elena Goloubeva at the following email address: egoloubeva@webb.edu.

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FEATURED ARTICLE

The American Institute of Mathematics and Its Programs

by Kent Morrison, American Institute of Mathematics

Founded in 1994 by John Fry, CEO of Fry's Electronics and a math enthusiast, the American Institute of Mathematics (AIM) is now located in San Jose, California, after recently moving from Palo Alto, where it was for 20 years.

One of eight U.S. mathematical sciences research institutes supported by the National Science Foundation, AIM strives to broaden participation in the mathematical sciences at every level, from professional mathematicians working on the most important mathematical problems of our day, to young students exploring the richness and beauty of mathematics through activities that encourage collaborative, creative problem solving.

AIM hosts over twenty workshops each year, where an enormous variety of topics and questions are considered. Many of the topics involve pure mathematics and are concerned with the fundamental questions of mathematics. This may involve, for example, understanding better how prime numbers are distributed, or understanding how to classify the basic geometric structures that occur in nature.

Other research topics of AIM are more applied, or a blend of pure and applied mathematics. A recent project brought together mathematicians and industry representatives to work on a variety

(continued)

of sustainability problems, including renewable energy, air quality, water management, and other environmental issues. One of the industrial participants was Driscoll's, whose associated growers are the largest supplier of fresh berries in North America. Three Driscoll's employees teamed up with nine applied mathematicians to evaluate how various water and land management techniques could be used by landowners and growers to work towards balancing aquifer levels. A video that highlights the project can be found at on our website at aimath.org.

In addition to the workshops, which have from 25 to 30 participants, AIM also hosts about 45 small research groups through the SQuaREs program. Each group has four to six participants and meets at AIM for one week a year for three years. As the SQuaREs program has become more widely known in the mathematical community, the number of applications submitted has grown tremendously.

AIM has several other programs that may also be of interest to members of the Metropolitan New York Section:

Research Experiences for Undergraduate Faculty (REUF), a program in partnership with the NSF and the Institute for Computational and Experimental Research in Mathematics (ICERM), brings together faculty who teach at primarily undergraduate institutions and who are interested in beginning to mentor undergraduates in research. Faculty who teach and advise significant numbers of underrepresented minority students, students with disabilities, and first-generation college students are especially encouraged to apply. More information is available at <http://reuf.aimath.org>.

AIM created the Math Teachers' Circle Network to encourage problem solving in middle schools, and now there are nearly 70 active Math Teachers' Circles nationwide. A Math Teachers' Circle brings together middle school teachers and professional mathematicians for a monthly get-together devoted to problem solving, dinner, and conversation. With an ambitious goal of having several hundred circles within five years, AIM hopes to influence a significant percentage of the middle school math teachers in the country. More information about Math Teachers' Circle is available on the website at www.mathteacherscircle.org and in an article in the Notices of the AMS, Dec. 2014 (www.ams.org/notices/201411/rnoti-p1335.pdf).

In 2013, AIM announced a new partnership with the Julia Robinson Mathematics Festivals. These festivals, one-day events held at various sites around the country, inspire children to explore the richness of mathematics through engaging, thought-provoking problems, games, and puzzles. Whereas many extra-curricular mathematics events for students are competitive in nature, the Julia Robinson Festivals are deliberately designed to encourage cooperation and collaboration among the student participants. More information about the program can be found on the website jrmf.org.

For the past four years the AIM Open Textbook Initiative has promoted the use of open source and open access textbooks. The work is led by an editorial board of five mathematics faculty with years of experience both in the college classroom and as authors and editors of undergraduate math texts. The board has evaluated almost 100 books and found more than 30 that meet the established criteria to be considered as the required text in a standard undergraduate course. The information about these books is provided on the AIM website in such a way as to make it efficient for instructors to determine whether a book is a reasonable candidate and deserves a closer look. More information about the textbook initiative can be found on the AIM website aimath.org/textbooks and in articles in the Notices of the AMS, Aug. 2013 (www.ams.org/notices/201307/) and in MAA Focus, Dec. 2013/Jan. 2014, p. 35 (digitaleditions.walsworthprintgroup.com/publication/?i=187509).

HUMOR

Feet of Clay Prizes Announced¹

by Raymond N. Greenwell, Hofstra University

To celebrate mathematics in some unspecified millennium, the Feet of Clay Institute (FCI, not to be confused with the Clay Mathematics Institute or the South Dakota College of Soil and Clay) identified seven mathematics questions that are either important or just old (most likely the latter) that resisted all attempts by our freshmen precalculus students to solve them. The FCI designated the \$7 million prize fund for their solution, with \$1 million allocated to each Millennium Prize Problem. (Actually, we only have \$1 million total to give out, but we think that's still a lot.) The Scientific Observation Board (SOB) of the Feet of Clay Institute will consider a proposed solution to a Millennium Prize Problem if it is a complete mathematical solution to one of the problems that follow. (Sorry, but it turns out we really have just \$10,000 in prizes to give out.) In the case that someone discovers a mathematical counterexample, rather than a proof, we will keep the money ourselves. (We were wrong; we just have \$100 left.) A proposed solution to one of the Millennium Prize Problems may not be submitted directly to the Feet of Clay Institute, the Clay Mathematics Institute, the South Dakota College of Soil and Clay, or any other institute for consideration. (We regret that we appear to have no money to give out, but we do have a bunch of MAA pencils that we picked up in the exhibit area at the San Antonio math meetings.)

Before consideration, a proposed solution must be rejected by a refereed mathematics journal of world-wide repute, and it must also have general acceptance in the mathematics community two hours after. (Except my wife took all the pencils to her office. I wish she'd get some pencils of her own.) Following this two-hour waiting period, which gives us time for a leisurely lunch, the SOB will decide whether a solution merits detailed ridicule. In the affirmative case, the SOB will constitute a special advisory committee, which will include at least one SOB member and at least two non-SOB members who are equally ignorant. The SOB will seek advice to determine potential non-SOB members who are unbiased, internationally-recognized mathematical experts in the area of the problem. As part of this procedure, each proposed solution under consideration must be verified by one or fewer members of this special advisory committee.

The official statements of the FCI Millennium Prize Problems will be posted on our website as soon as we can find where we put the statements, and also once we remember the password to our website. This misinformation will be put into final form during 2015 and published by FCI in a book to be published by the American Mathematical Society (AMS), assuming we can find an AMS official who can be enticed. The sales of this book will enable us to have a nice sabbatical in Tahiti and buy some new pencils to replace the ones my wife took.

¹ For comparison with the Clay Prizes, see <http://www.ams.org/notices/200008/comm-millennium.pdf>.

Unofficial But Close Enough Statements of the Problems

1. Goldfinger's Conjecture: Every odd prime is the sum of two even numbers greater than 2.
- b. The Identical Twin Prime Conjecture: There are an infinite number of pairs of primes of the form p and $p + 1$.
- iii. P vs. NP: The famous hypothesis in computer science, $P = NP$, is true if N is the identity matrix.

(continued)

- D. Fermat's First Theorem. There are no positive integer solutions to the equation $x^n + y^n = z^n$ for positive integers $n \leq 2$.
- The Hodge-Podge Conjecture: We have no idea.
- The Poincaré Conjecture (reportedly solved by Grigori Perelman, except he didn't have enough room in the margin to write his proof, so we're still going to count this one): One simply connected three-dimensional compact manifold is enough.
- VII. The Riemann Hypothesis: All zeros are trivial.

0.49714987269413385435126828829089887365167832438044244613405349992494711208955267465554738646429122236942858999235964391512872533746230848343607521652099021802834676210775693568591570723393847566365266

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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/metro/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 Dan King at dking@sarahlawrence.edu.

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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.

MATH IN THE NEWS FROM THE MAA

(much more can be found at: <http://www.maa.org/news> and <http://mathdl.maa.org>)

75th Annual Putnam Competition: MIT Takes First Place, Sets New Record

Competitors from Massachusetts Institute of Technology (MIT) at the 75th annual William Lowell Putnam Mathematical Competition swept up most of the highest scores. Not only did one of MIT's three-person teams claim first place in the competition, but MIT now holds the record for the number of individuals ranking in the top-five highest exam scores in a single year.

Exactly 4,320 students from 557 colleges and universities across the United States and Canada took the exam on December 6, 2014. This is the eighth team win for MIT, which includes a \$25,000 prize and additional \$1,000 awards for each team member (Mitchell M. Lee, Zipei Nie, and David H. Yang).

Harvard University's team took second place, and Rensselaer Polytechnic Institute placed third. This is the first top-five finish for Rensselaer.

The six-hour Putnam consists of 12 problems designed by a Questions Committee: Hugh Montgomery (University of Michigan), Henry Cohn (Microsoft and MIT), and David Savitt (University of Arizona). The highest exam score was 96 out of a possible 120 points.

Participants who achieve the top five overall scores on the exam are named Putnam fellows and receive a \$2,500 prize each. This year was distinctive because there are six Putnam fellows, thanks to a three-way tie for fourth place (a score of 81).

The nationwide median score was 3, which is the highest median score since 2002, said Joseph Gallian, professor in the Department of Mathematics and Statistics at the University of Minnesota Duluth. In addition, "34 percent of the participants had a score of zero, the lowest percentage since 2003," added Gallian, who served as president of the MAA from 2007 to 2008. Gallian will present more interesting facts, statistics, and history about the Putnam—and other MAA competitions — in his [lecture](#) "Seventy-Five Years of MAA Mathematics Competitions" at the 2015 MAA MathFest, which will be held in Washington, D.C., this August.

Winning teams can be found listed on the MAA [website](#), and more details about the 2014 William Lowell Putnam Mathematical Competition will appear in the October 2015 *American Mathematical Monthly*.

The high scorer in our Section is Minh Phuong Nguyen of Stony Brook University (SUNY), who earned an Honorable Mention designation.

2014 Fields Medalists Announced

At the opening ceremony of the International Congress of Mathematicians 2014 in Seoul, Korea, on August 13, Fields Medals were awarded to

[Artur Avila](#) for his profound contributions to dynamical systems theory, which have changed the face of the field, using the powerful idea of renormalization as a unifying principle. Artur won a Gold Medal for Brazil at the 1995 IMO.;

[Manjul Bhargava](#) for developing powerful new methods in the geometry of numbers, which he applied to count rings of small rank and to bound the average rank of elliptic curves (Manjul Bhargava is the son of Metro NY Section's Mira Bhargava of Hofstra University);

[Martin Hairer](#) for his outstanding contributions to the theory of stochastic partial differential equations, and in particular for the creation of a theory of regularity structures for such equations;

[Maryam Mirzakhani](#) for her outstanding contributions to the dynamics and geometry of Riemann surfaces and their moduli spaces. Maryam won a Gold Medal for Iran at the 1994 and 1995 IMOs.

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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