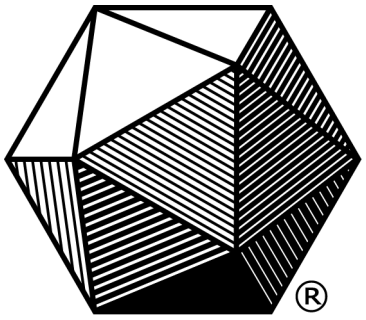
The Mathematical Association of America



Wisconsin Section

Newsletter

Spring 2009

Governor's Report

The financial downturn of the past year has not only affected most of us personally but has also affected the MAA, which invests its financial assets fairly conservatively. Still, the MAA's 6.5 million dollar portfolio of investments is worth about a million dollars less today than it was this time one year ago. Fortunately, the organization still has plenty of reserve, and good planning keeps it from running into cash flow problems. In addition, the organization has several million dollars in other assets such as the headquarters building, so the MAA is financially sound. One point of concern is that the MAA has been operating in the red for the last several years, and although we are not hurting yet, the trend clearly cannot go on indefinitely. To meet the challenge, the MAA is considering several changes that would encourage new memberships and increase the rate at which old members renew their memberships. I found it surprising that the number of paid members varies considerably through the year, and if more members would renew their memberships before they run out, the organization would save the expense of advertising to these former members. There are financial charts available for viewing in the members-only area of the MAA web site at www.maa.org.

The Board of Governors is discussing whether the organization's journals should be made available on-line and whether discount memberships could be offered to those who wish to receive their journals only on-line. Due to our success at encouraging student presenters at MAA Section meetings across the country, the MAA will need to cease its policy of extending free student memberships to these speakers. Unfortunately, student memberships are costly because students frequently change addresses and rarely renew their memberships. Another cost cutting change has been the reformatting of the MAA newsletter, FOCUS, which will now be thicker but only published bimonthly. As you may have noticed, the MAA has also gone to an electronic voting system. Please keep your e-mail address up-to-date in the member area of the MAA web site, so the MAA can contact you with your ballot information. Paper ballots will now only be available for those members who specifically contact the MAA to request one. The new system will not only save money but will result in a larger turnout for elections.

Christine Stevens has served as director of Project NExT since its inception and her energetic contributions have been credited for much of the program's success. This summer she will be stepping down as director and will be replaced by Aparna Higgins who shows every sign of continuing the strong leadership Project NExT has enjoyed.

The MAA is putting to good use the Carriage House, the small building directly behind the MAA headquarter building. Besides serving as an excellent site for committee meetings, it provides a venue for presentations enjoyed by our colleagues in the Washington, DC area. Those of us who cannot make it to those DC presentations on a regular basis can catch many of the presentations on YouTube.

Members of the MAA Board of Governors are encouraged to be active on MAA Committees. I have just joined the MAA Committee on Minicourses which reviews proposals for new minicourse offerings at the national meetings, helps the minicourses to run smoothly, and evaluates each course.

Jonathan Kane, Section Governor

Chair's Report

The 77th Annual Spring Wisconsin Section MAA Meeting will be April 24-25, 2009, at the University of Wisconsin – La Crosse. Without apology, we solicit contributed talks on the most pure areas of mathematics with or without practical applications, as well as talks specifically on applications. We also solicit talks in all areas of statistics. As is true each year, this meeting is an opportunity to present papers and preliminary reports to our good colleagues across the State. Bob Wilson, University of Wisconsin–Madison, has a rich and varied program in the works and the intention is that everyone who attends shall have a splendid time.

The theme of the meeting is Mathematics Education, and a more timely theme could not have been chosen. The winds of change have swept through Washington DC, and in every third speech or so, the new president brings up the need for more math and science teachers, and sets forth the meeting of that need as one component of his plan to revive the economy. These are exciting times. Society will be looking for innovations and improvements in mathematics education in the next several years. Expectations will be high. Yet, ominously, the next generation of students is at great risk for failure. Never have children faced so many obstacles – broken families, families under stress from the ailing economy, families in which

children spend hours a day with video games and are rarely if ever read to, and so on. The teacher's job is to attend, and never before have children brought to school with them a greater need for adult attention.

We educate school teachers. Kenneth Gross, recipient of a Haimo Distinguished Teaching Award in 2008, said that a school teacher needs to be a mathematician, biologist, social worker, statistician, and several other things. It is our job to define in that context what it means to be a mathematician and a statistician. Is it desirable for a teacher to understand one-to-one correspondence, the pigeon hole principle, "How big is infinity?", the Schrőder-Bernstein Theorem? Must a teacher comprehend percentiles, expected value, the central limit theorem, the T-distribution? Some of these questions can never be answered definitively, but they and dozens of others like them provide a useful point of departure for the annual meeting. If you have done interesting work in mathematics education, then consider contributing a talk.

Kristen Lampe, Chair of the Committee on Math Contests, will be leaving that post in April. The high school mathematics contests are one of the most important functions of the MAA and of the Wisconsin Section. On behalf of the Wisconsin Section, I thank Dr. Lampe for six years of excellent service. The next Math Contest Chair will be Laura Schmidt, UW-Stout. Dr. Schmidt has several years of experience running the State Math Contest, and in that capacity has made a difference in the lives of thousands of Wisconsin high school students, and hundreds of high school mathematics teachers. We honor that service, and it is with pleasure that we welcome Laura to the Executive Committee. Her term will run from April 25, 2009 until the spring meeting in April, 2012. Professor Irfan Ul-Haq has agreed to serve a second three-year term as Director of Project NExT Wisconsin. This term will also run from April 25, 2009 until the Spring meeting in 2012. I want to thank Irfan for his skillful leadership of our Project NExT for the past three years and express our gratitude that he will be putting his experience to good use by serving a second term.

Mark Snavely has agreed to run for a second term as Secretary-Treasurer. Mark has served in that position for three years and has served with distinction. He produces beautiful minutes of every Executive Committee meeting, provides treasurer's reports that are transparent, gives sound advice about fiscal matters, and does all this effortlessly. He is the first secretary-treasurer we have had in over 30 years who brings to the job the prior experience of being Chair of the Section, which makes him particularly valuable. He is a great pleasure to work with and on behalf of the Section I thank him.

Finally, I want to thank Ben Collins, Public Information Officer, Ken Price and Steve Szydlik, Student Activities Coordinators, Mohammad Ahmadi, Past Chair, Jim Marty, WMC Liaison, Jonathan Kane, Governor, and Robert Wilson, Chair-Elect, the remaining people on the Executive Committee. My work on the Executive Committee has been a source of great pleasure for me over the years and these people are favorably representative of the many people with whom I have worked. To all, thank you for the many pleasurable meetings and for all the good work we have done together.

Andrew Matchett, Chair

Contest Report

American Mathematics Competitions: The AMC 8 competition was held on November 13, 2007. A total of 1571 Wisconsin students participated in the competition (down from 1976). There were two perfect scores from Wisconsin, by Eric Johnson of Bay View Middle School in Green Bay and Amy Hua of Velma Hamilton Middle School in Madison. The average score for Wisconsin students was 10.34, compared with the national average score of 10.83. This gap has been narrowing for several consecutive years.

The AMC 10 and 12 contests will be held on February 10 and 25, 2009. Data will be reported at the Spring Meeting.

MAA-Wisconsin Section High School Contest Examination: The Section contest examination was given on Thursday, December 4, 2008. There were 71 schools reporting scores this year for a total of 3,198 students. This continues the downward trend, as last year there were 81 schools reporting 3,464 scores. The exam was a bit less difficult than last year, but still more difficult than the writers would like, given the dearth of perfect scores. The cutoff for the top 1% was a score of 71 out of 120 and there were no perfect scores this year.

Dr. Laura Schmidt has continued to head UW-Stout's efforts in running the competition. Many thanks to the UW-Stout faculty for coordinating these efforts. Dr. Schmidt has also agreed to take over as the Chair of the Committee on High School Math Contests.

Kristen Lampe, Chair, Committee on Math Contests

Student Activities

The Coordinators, Ken Price and Steve Szydlik, are pleased to report on opportunities for Wisconsin's undergraduate math students. We especially look forward to this year's section meeting at UW-La Crosse on April 24-25. Unfortunately, the MAA has discontinued its practice of giving complimentary memberships to undergraduate students who give presentations at sectional meetings. However, the banquet cost for students will continue be held to $5 per ticket. We will try to find low-cost housing options for students who wish to stay for both days. We plan to offer a student retreat room again this year.

The fast-paced math game show "Face Off!" was once again a part of the spring 2008 MAA Wisconsin section meeting in Madison and the Fall 2008 Pi Mu Epsilon Regional Undergraduate Math Conference in De Pere. "Face Off!" will return to the MAA section meeting again this spring. The new "Slammer" buzzer system allows us to include as many as ten teams. Students who have taken Calc I or above are eligible to compete for their department in teams of 2-4 players. Contact Ken (pricek@uwosh.edu) or Steve (szydliks@uwosh.edu) for details on the event or to register your team. You can also check the web site at http://www.uwosh.edu/faculty_staff/szydliks/faceoff.htm.

The Wisconsin Mathematics Council's Annual Green Lake Conference is scheduled for May 7-8, 2009. Anyone interested in any level of mathematics education in Wisconsin is encouraged to attend.

We look forward to student participation in state events and hope you encourage some of your students to attend conferences and to give presentations. Please let us know if you have ideas of ways to make the section more student-friendly. We're always looking for suggestions!

Ken Price and Steve Szydlik, Student Activities Coordinators

Project NExT-Wisconsin

At the spring meeting of MAA Wisconsin section, Project NExT-WI will have lunch followed by a panel discussion on Saturday April 25, 2009. The topic will be "K-12 Education: Link from High School to College." The NExT-WI fellows will explore the K-12 standards, the readiness of high school students for college courses, and the dialogue between colleges and K-12 educators about the standards, competencies and expectations needed to succeed in college.

Project NExT-WI also holds its annual Fall Workshop (during last week of September or first week of October) in Menomonie, WI which is open to all current NExT-WI members. Further details, when available, will be posted on the Project NExT-WI website (http://www.uwplatt.edu/nextwi/). Updates will also be sent to all the NExT-WI members.

Project NExT-Wisconsin is open to all full-time faculty members in mathematics departments in the Wisconsin Section who are within their first four years of undergraduate teaching. You may also be eligible if you have more teaching experience, but are new to the Wisconsin Section. There is no deadline to apply for the membership. One can apply any time during the academic year.

To apply, please contact me at ulhaqi@uwplatt.edu.

Irfan Ul-Haq Director, Project NExT-Wisconsin

Call for Nominations

The Wisconsin Section Distinguished Teaching Award was established in 1991. It stands as a concrete statement that mathematicians at the college and universities in Wisconsin place high importance on teaching. The Wisconsin Section is proud of its growing list of award recipients. These men and women of mathematics who have been recognized for their excellent work as teachers represent the commitment to teaching that exists among mathematicians throughout the state.

Nominations for the 2010 Wisconsin Section Distinguished Teaching Award are now being accepted. The nomination form and instructions are available for downloading as a pdf file on the MAA web site at http://www.maa.org/awards/teachingawards.htm or contact Mark R. Snavely Mathematics Department, Carthage College, Kenosha, WI 53140. Nominations should be submitted so as to arrive by November 1, 2009.

Nominee for Chair-Elect

Kristen Lampe, Carroll College

Kristen Lampe earned her PhD from Washington University in St. Louis in 1999 and her BA from the University of Dayton. She taught for one year at UW-Whitewater, before moving to Carroll University in fall of 2000. While in graduate school, her research was in the area of algebraic combinatorics. Since that time, her publications have been concerning the pedagogical aspects of mathematics as well as some interdisciplinary and recreational work.

Since beginning her career at Carroll, Kristen has taught most of the courses offered by the mathematics department. She has an interest in the mathematics courses taught to elementary education majors, and frequently teaches those courses. In support of this interest, she was involved in the grant-funded group NPrime (Networking Project for the Improvement of Mathematics Education) for four years, serving on the planning committee for the final two years of the grant.

Her involvement in the Wisconsin MAA section began six years ago, when she was appointed Chair for the Committee on High School Contests, a position she will hold until April 2009. She has also been active in the MAA as a Project NExT participant and, more recently, a Project NExT mentor.

Nominee for Secretary/Treasurer

Mark Snavely, Carthage College

Mark Snavely is in his nineteenth year of teaching at Carthage College, where he has chaired the Mathematics Department since 1995. Mark is very active in the MAA having presented numerous talks at Wisconsin Section meetings. He is currently serving as Secretary/Treasurer of the section. Mark has been a member of the MAA for over 20 years, and is also a member of the A.M.S. He received his Ph.D. and M.S. degrees from Northwestern University, and his B.A. from Grove City (PA) College.

Mark has published papers in his research area of symbolic dynamics, but his professional life has been devoted primarily to undergraduate research. He has also been involved in Carthage's efforts to integrate computing into the undergraduate mathematics curriculum, and to implement writing across the curriculum.

Volunteer to Help the Section

The Wisconsin Section invites nominations for the position of Chair-Elect. This is a three-year position. The Chair-Elect organizes the spring meeting. The following year, the Chair-Elect becomes chair, and presides at each meeting of the Section and of the Executive Committee of the Section, as well as appointing committees and Executive Committee members as needed. The final year, the Immediate Past Chair continues to sit on the Executive Committee, and oversees the selection of the Distinguished Teaching award.

Send nominations to Section Chair Andy Matchett at matchett.andr@uwlax.edu . Self nominations are encouraged. Section officers must be members of the MAA.

Spring Meeting

The next meeting of the Wisconsin Section will be on Friday and Saturday, April 24 and 25. Speaker proposal forms are still arriving and it is not possible to give a detailed schedule at this time, but that will be posted at the section website soon.

We will have three invited speakers of national prominence, two of whom are particularly well known to section members and have given excellent presentations at earlier meetings. Dan Teague, 2nd Vice President of MAA, may be less well known in the section: Dan is a great speaker and brings us a different perspective. He is a recipient of the Presidential Award for Excellence in Mathematics Teaching and other recognitions of his teaching as well as his work outside the classroom. He has served on the MSEB (the Mathematical Sciences Education Board) of the National Academy of Sciences, the U.S. National Commission on Mathematics Education, and other groups important in national educational policy, as well as MAA posts such as Governor at Large for Secondary Teachers. As a faculty member at North Carolina School of Science and Mathematics he can show us a view from (for many of us who teach at the college level) "the other side": We all have ideas about how students are prepared who come to us in college, but many of us don't really know how they get that way! Joe Gallian (University of Minnesota – Duluth) has just completed his term as President of MAA. Joe is known both for his mathematics and for his leading role in creating REU (Research Experiences for Undergraduate) programs, both his very successful REU program at Duluth and getting other REU programs going. Joe will probably talk on "Using Mathematics to Create Symmetry Patterns" and on "Research by Undergraduates Is Hot!". Ken Ono (UW – Madison) has given invited addresses at Wisconsin section meetings before, as well as twice at Mathfest, at other sections meetings, and at the joint AMS/MAA January meetings.

The meeting will begin at noon on Friday, April 24. Registration and exhibits including MAA book sales will continue until 5:00 that day, and will open again at 8:00 on Saturday.

"Face-Off!", our 'game show' for teams of undergraduates, will start at 5:30 on Friday. See the separate article in this newsletter for more information. The banquet will follow Face-Off!

Many of the speakers who have already submitted proposals have indicated their talks would be suitable for students, and we also will have talks by students. Please make sure your students know they will be welcome and will find much of interest, and also encourage them to submit talks!

Directions to UW-La Crosse

From the east on I-90: Take exit 5 toward La Crosse, and turn left onto HWY-16. You will be heading southwest. After 4.9 miles, HWY-16 turns right. Stay on HWY-16 now heading west and also named La Crosse Avenue. Go about six blocks, and then turn left on East Avenue at the stoplight. Cowley Hall is three blocks ahead on the right side of East Ave. However, it makes sense to park in any of the two "Commuter" parking lots on the right hand side of East Avenue as you drive toward Cowley Hall.

From the west on I-90: Take exit 4 and turn right on HWY-157. Hwy-157 curves to the east. Take a right on HWY-16, and follow the directions above.

From the east on US-14: US-14 joins HWY-35 south of town. Take HWY-35/US-14 north into La Crosse and follow the directions below.

From the south on HWY-35/US-14: Turn right on Losey Blvd. Losey immediately curves to the left, becoming northbound. After 3 mi, turn left on La Crosse St., then left on East Ave. Cowley Hall is three blocks ahead on the right side of East Avenue.

Parking

Park in any lot with the designation "Commuter Lot", even though the sign may say that permits are required. The parking lot beside Cowley Hall is a Commuter Lot, and there are two more further down the street to the north. The parking lot across the street from Cowley Hall, beside the athletic stadium, is also a Commuter Lot. We have been told that Commuter Lots will not be ticketed on Friday afternoon or Saturday, though overnight parking is not allowed. Do not park in any Resident Lot. See http://www.uwlax.edu/parking/map.htm for a map.

Lodging Information

Blocks of rooms are reserved at two motels:

Holiday Inn Express (http://www.ichotelsgroup.com/h/d/ex/1/en/hotel/lseon) , 9409 Hwy 16; Onalaska, WI 54650; 608-783-6555. There are 25 rooms held under the Math Department at State rate of $70. They have 2 Queen beds, a refrigerator, microwave and pull out sofa bed. They also have free continental breakfast and wireless internet; a pool and exercise room.

Hampton Inn of Onalaska (http://hamptoninn.hilton.com/en/hp/hotels/index.jhtml?ctyhocn=LSEWIHX), 308 Hampton Ct.; Onalaska, WI 54650; (608) 779-5000. There are 20 rooms held under the Math Department at State rate of $70. These have 2 queen beds, free hot breakfast, wireless internet, a pool and exercise room.

Other Options:

Best Western Midway Hotel (www.midwayhotels.com), 1835 Rose Street; La Crosse, WI 54601; (608) 781-7000 This hotel is on the north side of La Crosse on the River. There is an outside deck and beach area, as well as indoor pool and waterpark. They only had the following rooms available: 7 Single Rooms: $109.99; 1 Double Room: $109.99. Refer to UW-L Math Department

If you want to stay in downtown La Crosse, there may be rooms available, but they could not block a set of rooms for us. The La Crosse Math Department recommends:

Holiday Inn (www.holiday-inn.com/lacrossewi), 200 Pearl Street; (608) 784-4444

Radisson (http://www.radisson.com/lacrossewi), 200 Harborview Plaza; (608) 784-6680

Courtyard by Marriott (http://www.marriott.com/hotels/travel/lsecy-courtyard-la-crosse-downtown-mississippi-riverfront/), 500 Front St.; (608) 782-1000

Pi K and 2Pi K Run

In connection with the Annual Meeting, Karry Auby, of the UW-La Crosse Mathematics Department, has decided to attend to the cardiac fitness of the meeting participants. Accordingly she has planned a Pi K and 2Pi K fun run. The route goes through our marsh and over or along the scenic La Crosse River. The starting time will be 7:00 am, Saturday, April 25. Showers are available in Mitchell Hall on the UW-L campus, and participants may be able to do the run, shower, and still make it to the business meeting at 8:00 am. Details about the run are posted on the web:

http://www.uwlax.edu/mathematics/dept/Temp/PI%20K%20Fun%20Run.htm

REGISTRATION FORM

MAA Wisconsin Section Spring Meeting — University of Wisconsin-La Crosse

April 24-25, 2009 — Preregistration Deadline: **April 9, 2009**

NAME(S)_____

Address_____

Institution (for your name badge)_____

Registration				Banquet			
No.	Type	Price*	Total $	No.	Type	Price**	Total $
	MAA Member	$20			Regular	$20	
	Retired MAA Member	$10			Student	$5	
	K-12 Teacher	$10		Banquet Total:			
	Student	FREE		Please indicate any dietary restrictions (vegetarian, kosher, etc) and the number of each.			
	Other	$22					
Registration Total:							

*Registration at the meeting will be $25 for all except students, who will still be free.

**Regular banquet tickets will be $25 after the pre-registration deadline of April 9. Student banquet tickets remain $5.

Total Enclosed:

For MAA Records, please indicate the number of the above registrants in each of the following categories:

_____ College or university faculty
_____ Business, industry, government
_____ High school teacher
_____ Undergraduate student
_____ Graduate student

Finally, please indicate the highest degree awarded by your *department*:

☐ Ph.D. ☐ Master's ☐ Bachelor's ☐ Associate ☐ Not Applicable

MAKE CHECKS PAYABLE TO: MAA - WISCONSIN SECTION

PLEASE SUBMIT TO:

Mark Snavely, Treasurer (262) 551-5714
Mathematics Department snavely@carthage.edu
Carthage College
Kenosha, WI 53140

CALL FOR SPEAKERS

77th Annual Meeting of MAA Wisconsin Section, April 24 – 25, 2009

University of Wisconsin-La Crosse

The Spring 2009 meeting of the Wisconsin Section of the MAA will be held at UW-La Crosse on April 24 and 25. Talks of all kinds are welcome, particularly ones that are accessible to students, and we encourage talks by students. We plan an emphasis on connections between pre-college and college-level mathematics teaching, so talks relating to how students make the transition to college, preparation students bring to college courses, our role in preparing pre-college math teachers, innovations in teaching that might relate to pre-college courses, etc., are specifically solicited!

If you wish to present a talk at the Spring Meeting, please send the information below to:

Bob Wilson, Department of Mathematics, 480 Lincoln Drive, UW-Madison, Madison, WI, 53706
or (preferred) by email to wilson@math.wisc.edu

An on-line version of this form is available at: http://www.uwplatt.edu/maawisc/speaker.html

Electronic submission of the information and abstract is preferred.

(There is a separate form below for student speakers.)

SPEAKER RESPONSE FORM – DUE: March 6, 2009

Name: _____

Position: _____

Institution: _____

Address: _____

Phone: _____ Email:_____

Title of talk: _____

Length of talk: 25 minutes _____ or 50 minutes _____

Abstract: _____

_____

Check here if your talk is appropriate for students: _____

Equipment needed: _____

Time preference: Friday afternoon is Imperative ____ Preferred ____

Saturday morning is Imperative ____ Preferred ____

Either time is acceptable _____

For MAA records (optional): Female _____ Male _____

CALL FOR STUDENT SPEAKERS

Student Mathematics Conference

University of Wisconsin-La Crosse, April 24 – 25, 2009

The Wisconsin Section of the MAA encourages undergraduate students who have done research in mathematics to give a 25-minute presentation about their work at the Spring Meeting. If you wish to present a talk, please complete the form below and send by March 6, 2009, to:

Bob Wilson, Department of Mathematics, 480 Lincoln Drive, UW-Madison, Madison, WI, 53706
or (preferred) by email to wilson@math.wisc.edu

An on-line version of this form is available at: http://www.uwplatt.edu/maawisc/student.html

Electronic submission of the information and abstract is preferred.

STUDENT SPEAKER RESPONSE FORM – DUE: MARCH 6, 2009

Name: _____ Year in School_____

Institution: _____

Address: _____ Phone: _____

_____ Email: _____

Faculty Sponsor: _____

Title of presentation: _____

Brief description of presentation_____

_____

_____

_____

Equipment needed:_____

Time preference: Friday afternoon is Imperative ____ Preferred ____

Saturday morning is Imperative ____ Preferred ____

Either time is acceptable _____

For MAA records (optional): Female _____ Male _____

Face Off, The Mathematics Game Show

What is it? Face Off is a mathematics quiz show with questions from the broad realm of mathematics. And we mean broad! Teams of 2-4 students representing their schools compete to answer these questions. Each team gets a sign with the face of a mathematician (For example, your team could play as Descartes, Gauss, Hilbert, Fermat, or Newton.) A team holds up its sign to answer a question and earns points if its answer is correct. Teams can use a calculator, paper, and pencil. For more information, visit the Face Off website whose address is given below.

Where is it? MAA-Wisconsin Section meeting at MATC in Madison

When is it? Friday, April 24, 5:30-6:30

Sample Questions:

The *Off Limits* category contained the following questions.

20 pts. What is $\lim_{x \to \pi/2} \frac{\sin x}{x}$?

40 pts. What is $\lim_{x \to 2} \frac{x-3}{x-2}$?

60 pts. What is $\lim_{x \to 0} \frac{|x|}{x}$?

80 pts. What is $\lim_{x \to 1} \frac{2^x - 2}{x-1}$?

The *Take a Number* category contained the following questions.
20 pts. How many pips are on a standard die?
40 pts. What prime number is both the sum of two primes and the difference of two primes?
60 pts. What two-digit number has a cube root equal to the square root of the sum of its digits?
80 pts. What is the smallest non-palindromic number whose square is a palindrome?

Please contact one of the organizers if you would like to enter a team. Any student who has taken or is enrolled in Calculus I is eligible to join a Face Off team representing their school. If a school doesn't have enough interested students, contact the organizers anyway – we can combine interested students to form hybrid teams. Space will be limited, so form a team soon and let us know of your interest!

Face Off Organizers:

Dr. Ken Price (*pricek@uwosh.edu*, (920)424-1057),
Dr. Steve Szydlik (*szydliks@uwosh.edu*, (920)424-7346),
http://www.uwosh.edu/departments/mathematics/mathclub/faceoff.htm

Know Your Wisconsin Mathematician

Interview with Professor Richard Askey, UW-Madison, by J. Sriskandarajah, MATC

This is our sixth interview in this series. Professor Askey retired recently after a very successful career at the UW-Madison, Depertment of Mathematics (1963-2003). To learn more about his accomplishments, please visit: http://www.math.wisc.edu/~askey/

Q. Tell us something about your education, starting with elementary school.

A. Here is one story from grade school. I was in third grade, which was on the first floor, and walked by the room on the second floor in which math was taught to fifth and sixth grade students. I saw a symbol I did not know so asked my teacher what it was. We had done addition, subtraction, multiplication and division, but not square roots. She explained it was the symbol for taking a square root, explained what square roots were and how to calculate them. Later when I was in fifth and sixth grades, the teacher who taught math to all of the fifth and sixth grade students was still teaching. She and all of the teachers I had in grade school were good. This was in a suburb just outside of the St. Louis City line. It was a neighborhood with some professionals and some manual workers. Two doors one direction was an electrical engineer who worked for the telephone company and on the other side was a bus driver. We lived in a small six room house, with four children and our parents, with a grandmother living with us when there were only three children.

There are also two related stories from later years which are worth mentioning. In eighth grade, the teacher we had was just out of the Army. This was 1946-47. He finished the course with about six weeks left, so told us he was going to teach algebra. We did not have to listen, but we had to be quiet so others could learn. We moved at the end of that year, to Baltimore. There was an accelerated program where you could start high school in grade 9 and the last year was college level courses. I did not know about this, so finished junior high school and started high school in tenth grade, as was normal then. I found out about the accelerated program, and the 12th grade the math course was mostly analytic geometry and some calculus. I wanted to take this course and it was possible by taking intermediate algebra and solid geometry the first semester and trigonometry and advanced algebra the second semester in 11th grade. My first class was one of the math classes, and I went to the room for this class. The teacher started by saying that we would be learning how to solve some equations we did not know how to solve, and gave an example something like $x^2 + 4x + 5 = 0$. I raised my hand and said the solutions were $x = -2 \pm i$. He looked surprised and asked me where I had learned this. My answer was a good illustration of how to teach, tell the truth but not the whole truth. I said I had learned it in a different school system. I did not say that it was an eighth grade class, which it was. Later in the day I looked carefully at my schedule and found out I had gone to the wrong room. I should have been in the next room taking solid geometry. The class I had attended was advanced algebra. In the afternoon I went to the correct room for the intermediate algebra class. When I walked in, the teacher looked at me and asked what I was doing there. I said I had gone to the wrong room that morning, and this was where I should be. I have left out the story of when another student and I were taken to the principal's office in seventh grade for something I had written and my friend had put on the teacher's desk, and how I got out of the last half of trigonometry, the grubby solving triangles part with tables, so I could tutor a student who had to pass trigonometry to graduate. By and large, school was good, and I did what I could to get by without having to work too hard on things I was not interested in.

In the Honor Society in 11th grade, I helped set up a before school tutoring program. I left home at 7 to get to school by 8 to work with students who were in need of help. There was a Math Club in the high school. I went to one meeting in tenth grade, but when I found out they were playing math games, I did not go back. I was immature and did not appreciate the fact that math games could be useful. The student running the Math Club that year was a senior, Solomon Golomb. After he graduated, I went back to the math club and for most of the next two years helped teach some calculus. It was the most exciting mathematics I had seen, and I wanted to share some of what I was learning.

Q. What was the influence of your family on your education?

A. What mathematical talent I have was inherited from my mother. She only had one year of college due to family responsibilities, taking care of two younger half brothers, and family finances. A few years ago my wife and one of my sisters found a solution my mother gave to a homework problem given in analytic geometry in her year in college. A particular triangle was given with specific vertices and the problem was to prove that the symmetric medians meet at a point. Her solution was about three pages long of detailed

calculations with trigonometric functions. There are elegant ways to prove this theorem in general, but her solution was one I would like students to be able to do, since she appropriately used a lot of trigonometry and facts about equations of lines. She was a wise woman. She told me many times that the grades I got were not important, what was important was what I learned. The only pushing I got was to finish a few projects which I was not interested in. She strongly suggested I take typing in high school. This was useful when I typed my thesis, and now in the internet age, it is again useful to be able to touch type.

Q. What about your work in college and graduate school?

A. My undergraduate work was at Washington University in St. Louis. This was a good place for me. They had some very good faculty and a few good students, some undergrads and some graduate students. I.I. Hirschman gave me a problem to work on when I was a senior, and we eventually jointly published a solution of it. This is what got me involved in special functions. I was hired as a freshman to grade homework in some math classes. I got sick and tired of grading, but it is a good idea and I have been disappointed a number of times when it was not possible to hire undergraduates at UW Madison to grade classes. Lack of money was not always the problem, sometimes it was someone in the Dean's Office who felt this was a bad idea. That was not always the case. Back about 1967, I was allowed to hire an undergraduate to grade the homework in a graduate course which he had not taken. He had taken the year analysis course which Walter Rudin had developed, which was enough for him to grade a course on Hilbert Spaces. This undergraduate is now a Professor of Geophysics and when he was an Associate Dean, it was possible to hire qualified undergraduates to grade papers. I would likely not have pushed as hard on this if I had not graded so many papers, including grading advanced calculus papers one year when I was taking the course.

For graduate school, I spent a year at Harvard, decided I had made a mistake in going there rather than Princeton, so wrote and mentioned this, and was accepted at Princeton. Princeton got good graduate students, and most of them had taken the courses which elsewhere were usually taken by first year graduate students, so they did not give these courses regularly, and encouraged students to help each other fill in gaps of knowledge which were not being taught then. I worked at Bell Labs in Murray Hill for two summers, and got to know two very important mathematicians who visited for part of a summer. Mark Kac was one, and Arne Beurling was the other. Beurling gave me a couple of problems as possible thesis topics, but I was never able to solve them. After two years at Princeton, I had passed the exams but not written a thesis. I got married and decided to take an instructorship at Washington University and try to write a thesis there. I made some progress and went back to Princeton for a summer to finish the work. I saw Bochner once a week, and each time started from scratch since the topic was one he probably did not care that much about. I agree with this now, but then it was what I could do. He suggested two other problems to work on after I got my degree, both of which were more interesting and important than what was in my thesis. That is an ideal gift from a major professor, something harder to work on next.

Q. You went to the University of Chicago and then came to Madison. How did this influence your development?

A. The University of Chicago is one of the great universities in the world. I learned a lot from attending the Calderon-Zygmund seminar, but the most important thing which happened to me was finding out that Steve Wainger and I had complementary knowledge so were able to solve some problems which had vexed us separately. In particular, we solved both of the problems Bochner had suggested. This took some time and to make it easier for us to work together Wainger visited the University of Wisconsin for a year, and then was hired. In the course of solving one of the problems, we came across some gaps in the knowledge of some classes of orthogonal polynomials. At this point Wainger and I went different ways. I worked on the orthogonal polynomial problems and Wainger worked in a number of different areas. My work was initially on norm inequalities in L_p spaces. The polynomial problems led to work on positive operators, which in some sense can be thought of as sharp inequalities. This led to certain identities which were not known and should be found. George Gasper, who spent time in Madison as a postdoc, Tom Koornwinder, whom I met in Amsterdam where we spent a year on leave in 1969-70, and others were the people who solved the harder problems. Three of the others were Ph.D. students in Madison, Charles Dunkl who worked with Rudin and Dennis Stanton and James Wilson who were my students. George Andrews spent a year on leave in Madison, and I caught the q-disease that year. Mourad Ismail also spent a post-doc year in Madison, and has solved many interesting problems.

Hypergeometric series are series whose ratio of the n+1st term to the nth term is a rational function of n. Basic hypergeometric series have a term ratio which is a rational function of q^n. There was an important paper on the classical type orthogonal polynomials which are represented as basic hypergeometric series by

Wolfgang Hahn. This was published in the late 1940s, and 30 years later no one had worked out the orthogonality conditions which he left open. Andrews and I both wanted to work this out, which was the main reason he came to Madison. Half of his support came from the University Research Committee, WARF money, and the other half from the Mathematics Research Center. We worked out the orthogonality relation of the most general polynomials Hahn found, but more importantly, polynomials at one higher level were discovered and their orthogonality worked out. There are called the q-Racah polynomials when the orthogonality is a finite sum and the Askey- Wilson polynomials when the orthogonality has an absolutely continuous measure. Polynomials discovered by L.J. Rogers in the middle 1890s are a special case, but the orthogonality relation for them was first found as a special case of the general polynomials Wilson and I found. These polynomials and special cases are showing up in many different contexts. There was one other thing which came from George Andrews's year in Madison. In the spring he and his family went to Europe, and in the Wren Library at Trinity College Cambridge he found a bit over 100 pages in Ramanujan's handwriting, which he called the "Lost Notebook". This is not the place to write about the importance of this find, but it led to at least one important result which can be explained to non-mathematicians. There was an interview with Andrews in "The Hindu", and at the bottom of the full page story was an interview with Ramanujan's widow. She said that they had promised to make a statue of her husband, and lamented: "Where is the statue?" After reading this, a bust was commissioned, to be made by Paul Granlund. Initially four castings were made, and one was given to Janaki Ammal, Ramanujan's widow. You can see a photograph of this bust on my website. www.math.wisc.edu/~askey We visited her in December, 1987, and she said that when the bust arrived it was like the return of Ramanujan's spirit to her home.

Q. You have spent a lot of time on mathematics education. Why, and what do you hope to accomplish?

A. The "why" has a simple answer. Over 20 years ago I was finding it harder to teach calculus than before, and I wanted to find out why and see what could be done to reverse this trend. The "what" is more complicated. I would like teachers to have more content knowledge. Twenty years ago almost no one was saying this. One person who was saying this was Lee Shulman. In his presidential address to the American Education Research Association, Shulman called content "the forgotten part of education", and called for teachers to develop pedagogical content knowledge. He started with some questions for teachers in California in 1875. You can see questions like those he used by going to www.google.com and search for “askey mad lit talk”. This is a talk I gave to the Madison Literary Club.

There are quite a few textbooks which define lines to be perpendicular when the product of their slopes is –1. That should be a theorem, not a definition. That is but one example of what I would like to see in school mathematics, a distinction between a theorem and a definition. I dislike reading a program which uses the law of sines and the law of cosines to prove similarity theorems for triangles when similarity is needed for at least right triangles to even define the trig functions.

There has been some progress. Curriculum Focal Points from NCTM is a significant improvement over their 1989 Standards and their 2000 version. The National Mathematics Advisory Panel has a good report on preparation for algebra and a good description of what school algebra should be. To understand that their listing of topics is not just a list, you have to read the Task Group Report on Conceptual Knowledge and Skills. It is on the web and worth reading. It should influence courses given for prospective teachers.

Q. Do you have any other comments?

A. The work I have been doing in mathematics education is something which needs to be done. Without firm knowledge of content, mathematics education can take some unfortunate detours. Every so often something is done which can help change unfortunate directions. Liping Ma's book "Knowing and Teaching Elementary Mathematics" is one example. If you have not read it, do! A more recent book which I highly recommend is "Arithmetic for Parents" by Ron Aharoni. He is an Israeli mathematician who has been teaching math in elementary school since about 2000. This book is published by a private firm set up by a mathematician at Berkeley. The name of the publishing firm is "Sumizdat", one of the most interesting names for a publisher I have seen. Ask a Russian if you do not understand why this is so interesting. This mathematician, Alexander Givental, has also published two geometry books, translations with some changes of books originally written by Kiselev in the 19th century. I recommend all three of these books.

Who is a Wisconsin Mathematician that you would like to know? Send suggestions for the next KYWM to Ben Collins, collinbe@uwplatt.edu .

Campus News

Alverno College *submitted by Susan Pustejovsky*

Jim Factor began at Alverno in fall 2008. Jim is teaching a variety of mathematics courses here, and will be teaching computing as well.

Carthage College *submitted by Mark Snavely*

During the fall of 2008, students from the Carthage Mathematics Department gathered to help senior **Michelle Nordrum** illustrate the results of her summer research project by participating in a football-field-sized demonstration of the Road Coloring Theorem. Find the video on You Tube by searching "Road Coloring Event".

Madison Area Technical College *submitted by J. Sriskandarajah*

Math Club's Spring 2009 events

80 Thursday, January 22, 3:30 PM, Professor **Steven Post**, Edgewood College - Room 209, Mathematics: A Symphony, Not A Scale

#81 Tuesday, February 24, 3:30 PM, Professor **Terry Jo Leiterman**, St. Norbert College - Room 209, How We Roll: Theory and Construction of a Squared Wheel

#82 Tuesday, March 10, 3:30 PM, Professor **Susan Hollingsworth**, Edgewood College - Room 209, A Knights Tour

Friday, April 3, Mathematics Awareness Month Celebrations - Sudoku Festival, Mitby Theater

#83 8:45 - 9:30 AM, Professor **Jane Tanner**, SUNY Onandaga CC, What's puzzling you???

#84 9:30 - 10: 15 AM, Professor **Benjamin Collins**, UW-Platteville, Fibonacci Trees: A Dream Come True

10:30 - 12: 15 PM, Who Wants To Be a Sudoku Master 2009, presented by Professors **Jonathan Kane**, UW - W and **George Alexander**, MATC

#85 Wednesday, May 6, 3:30 PM, Professor **Norb Kuenzi**, UW- Oshkosh - Room 321, What are Trapezoidal Numbers?

Further information is available at **http://matcmadison.edu/studentlife/clubs/mathclub**

UW-Eau Claire *submitted by Simei Tong*

Dr. **James S. Walker** and his students from the NSF-REU program SUREPAM held at UWEC (**Xiaowen Cheng**, U of Minnesota and **Jarod V. Hart**, UW-La Crosse) published a paper "Time-frequency Analysis of Musical Rhythm," in the AMS Notices, March 2009. `http://www.ams.org/notices/200903/`

Dr. **Michael Penkava** published 4 papers in 2008. In the winter of 2008-09, he was in Budapest, working with **Alice Fialowski** on the problem of classification of 4-dimensional complex associative algebras. These four papers are

1. with Alice Fialowski "*Moduli spaces of low dimensional real Lie algebras*" J. Math. Phys. 49 (2008), no. 7, 073507, 16 pp.
2. with Alice Fialowski, "*Extensions of $L\sb \infty$ algebras of two even and one odd dimension.*" Forum Math. 20 (2008), no. 4, 711--744.
3. with Alice Fialowski, "*Formal deformations, contractions and moduli spaces of Lie algebras.*" Internat. J. Theoret. Phys. 47 (2008), no. 2, 561—582.
4. with Marilyn Daily and Alice Fialowski, "*Comparison of 3-dimensional $\Bbb Z$-graded and $Z\sb 2$-graded $L\sb \infty$ algebras.*" Comm. Algebra 36 (2008), no. 1, 232--257.

Dr. **Sherrie Serros**, Dr. **Simei Tong**, with Dr. **Kathryn Ernie** (UW-River Falls) and Dr. **Rebecca LeDocq** (UW-La Cross) contributed a chapter "Mathematical Reasoning" in the book: Exploring Signature Pedagogies, R.R. Gurung, N.L. Chick, and A. Haynie (eds.), Stylus Publishing, LLC. (2009)

Dr. **Shyam Chadha** and Dr.**Veena Chadha** presented their research findings "A Generalized Linear Fractional Program" at the sixth AIMS International Conference on Management, December 28 – 31, 2008 at Greater Noida, India.

Student **Mitch A. Phillipson** received a poster award at the MAA Undergraduate Poster Session at the Joint Mathematics Meetings 2009. His poster titled "Extensions and Deformations of Associative Algebras," was on research conducted under faculty mentor Dr. **Michael Penkava**. Two more posters from UWEC were among those on display. They were "Optimizing the Evacuation of Hospitals" by **Kaitlyn Hellenbrand** and **Mark**

Bauer, and "The Busemann-Petty Problem" by **Emily Klungtvedt**. Both projects were under the direction of faculty mentor Dr. **Simei Tong**. All four students received grants from MAA to travel to Washington D.C. for the Meetings. Dr. **Colleen Duffy** and Dr. **Amanda Riehl** served on the faculty judge team for the student poster session.

Student **Rochelle Halama** a senior mathematics major, is spending this spring semester as an intern at a NASA flight facility in Virginia. During her internship with the National Aeronautics and Space Administration, she will focus on researching ways to prove software reliability.
http://www.uwec.edu/newsreleases/08/nov/1110NASAintern.htm

UW-Madison *submitted by Bob Wilson*

Alex Nagel has been elected as a Fellow of the AAAS (American Association for the Advancement of Science). Alex was honored "for fundamental work on singular Radon transforms, oscillatory and singular integrals, the Carnot metric with applications to subelliptic estimates and several complex variables."

Our former Chair, **Leslie Smith**, has been elected a fellow of the American Physical Society (APS) "for important and insightful contributions to the understanding of turbulence in engineering and geophysical flows through theory and numerical simulations".

Ken Ono has been awarded a second endowed professorship by the University of Wisconsin. In August 2008 he was named the Hilldale Professor of Mathematics to accompany his designation as the Solle P. and Margaret Manasse Professor of Letters and Science.

Julie Mitchell, **Gheorghe Craciun**, **Paul Milewski**, **Tom Kurtz** and **David Anderson** have created new courses in mathematical biology. The Mathematics Department will be introducing four new courses in Mathematical Biology at the advanced undergraduate and beginning graduate level (Math 605, 606, 608, 609). The courses will cover biological topics that range from atomic level models of molecules, to systems level models of metabolic and regulatory processes, to statistical models of cells and organisms. The mathematics used in these subjects includes partial differential equations, numerical optimization, dynamical systems, and stochastic analysis, in addition to some more basic mathematical tools.

Paul Rabinowitz received an honorary doctor's degree from the Universidad Complutense de Madrid, Spain, in late January.

A three-day conference, affectionately known as "Georgia Fest", was held February 16-18, 2008, in honor of **Georgia Benkart**, who retired from teaching in 2006.

On August 19-22, 2008, The Fields Institute hosted a conference celebrating the career of **Peter Orlik**.

Since the first grad student conference in probability in 2007 was such a success, the UW graduate students from the Probability group decided to organize a second one in the same spirit, but larger.

On April 3, 2008, UW hosted the second annual miniconference on pro-p groups and pro-p algebras in number theory, organized by **Nigel Boston** and **Jordan Ellenberg**.

Since MathFest was in Madison last summer, we were able to have a reunion like the ones we have every year at the Joint Mathematics Meetings in January but this time right at home in Van Vleck Hall. About a hundred friends of the department, ex-students (graduate and undergraduate), faculty (present and retired), visitors, etc., got together on the ninth floor lounge for snacks and conversation.

Several members of the math department have been working with the Madison Metropolitan School District in a program called EMK (Expanding Mathematical Knowledge). MMSD teachers in grades 3 through 5 had an intense week last summer with either **Shirin Malekpour** or **Bob Wilson** (there were two groups, one focused on algebra and the other on geometry) and continued about once a month during the year with Shirin, Bob, and grad student **Dan McGinn**. The program will continue in the summer of 2009 and probably on into the next academic year also.

The UW Math Department has received a $100,000 gift from the estate of **Richard Good**. Professor Good received his AB from Ashland College in Ohio, and his MA and PHD from our department in 1940 and 1945 (his Ph.D. advisor was Richard Bruck). He taught at the University of Maryland.

In cooperation with the Madison schools, the department has started running sections of some courses very early in the morning to allow talented local high school students who have finished Calculus BC to come to UW to study more advanced math courses without missing too many of their regular high school classes. After success last year, this coming year the program will include courses up through linear algebra. The classes include both high school and college students.

A joint committee of the math department, the School of Education, and the Madison Metropolitan School District has revamped the existing math content courses for elementary education (and special education) majors, and developed new, additional, math content courses specifically targeted at future middle school math teachers. Since most prospective middle school math teachers meet the same certification requirements as elementary teachers, these will be part of new math/science minor that elementary education majors can take to prepare them specifically to do a good job at the middle school level.

UW-Milwaukee *submitted by Jay H. Beder*

The annual Marden Lecture in Mathematics has been scheduled for Wednesday, April 29, from 4:00-5:00pm. The speaker will be Prof. Denis Hirshfeldt from the University of Chicago. He is a logician with interests in computability theory. The title and further information will be available soon, and will be posted at http://www.math.uwm.edu (click on "Events").

UW-Platteville *submitted by Julie McDonald*

Miyeon Kwon and **Irfan Ul-Haq** received a grant from Wisconsin Alliance for Minority Participation (WiscAMP). The title is "Summer Bridge Program: Bringing them up to Speed." The focus of this grant is to develop a summer program for the underrepresented minority students who are lacking necessary mathematics skills i.e. placed lower than Calc I. It will be a four week long program run during the summer 2009. It is intended for freshmen entering UW-Platteville in Fall of 2009. In the following years it may be expanded to include other UW-campuses.

Leonida Ljumanovic attended MathFest and the Joint Math Meetings as a national Project NExT participant.

UW-Stout *submitted by Steve Deckelman*

Laura Schmidt has accepted the position on the Wisconsin MAA executive board as the Chair of the Committee on High School Math Contests. **Laura Schmidt**, **Eileen Zito**, and **Steve Deckelman** attended the Joint Meetings in Washington and gave talks. **John Hunt**, along with 5 students, attended the 23rd Annual Pi Mu Epsilon Regional Undergraduate Math Conference at St. Norbert College.

UW-Whitewater *submitted by Mohammad Ahmadi*

Athula Gunawardena has published his joint paper with **Robert R. Meyer**, on "Discrete Approximations to Real-Valued Leaf Sequencing Problems in Radiation Therapy", in Discrete Applied Mathematics, (2008) 156-17, 3178-3186. **Athula** and **Robert** also published a book titled *Algorithms on Discrete Near Optimal Partitions: Applications in Higher Dimensional Domain Decomposition, Intensity Modulated Radiation Therapy (IMRT) including Arc Therapy (IMAT)*, VDM Verlag Dr. Müller , (2009).

Jonathan Kane attended the Joint Mathematics Meetings in Washington, DC in January. On February 28 he delivered a talk about Vectors to the Metroplex Math Circle in Dallas, Texas. On March 11 he delivered the talk "Dropping Lowest Grades" to the math club at UW-Washington County. On April 3 he helped run the "Who Wants To Be A Sudoku Master" competition at the Madison Area Technical College. April 16 & 17 he spoke at the MSRI Workshop on Mathematics Festivals.in Berkeley, California about the Purple Comet*!* Math Meet.

Ki-Bong Nam is on sabbatical leave for this semester spending most of his time in South Korea. He will use his research fund from Korean Brainpool for research and teaching during Feb. 24 -Aug. 2, 2009. He has published the following joint papers.

1) Chen, Xueqing; Lee, Jeong-Sig; Nam, Ki-Bong, "Notes on (Z^2)^n-graded algebras" Int. J. Algebra 2 (2008), No. 9-12, 555--562.

2) Choi, Seul Hee; Lee, Jongwoo; Nam, Ki-Bong "Derivations of a restricted Weyl-type algebra containing the polynomial ring", Comm. Algebra 36 (2008), No. 9, 3435--3446. 17B40

Thomas Drucker was part of a panel on the intersection of history and philosophy of mathematics sponsored jointly by POMSIGMAA and HOMSIGMAA in Washington, DC in January. He gave a talk on the History Special Session for the AMS on Coxeter and Bourbaki. **Thomas** also played the roles of the Mad Hatter and Euclid in the dramatization of the life of Lewis Carroll by Robin Wilson. He wore a cheesehead rather than the typical hat for the role in recognition of his coming to the meetings from Wisconsin.

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