

EMISSARY

Mathematical Sciences Research Institute

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MSRI Turns 25, Celebrates

Erica Klarreich

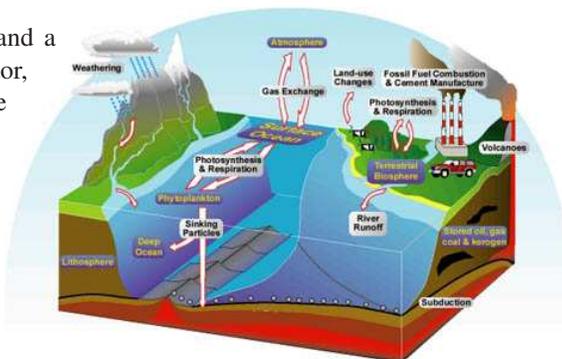
“It’s just a wonderful thing to be here with 80 people, any of whom I’d be happy spending the afternoon talking to.” This remark, made by Persi Diaconis at the opening of a lecture on the mathematics of chance, was a fitting motto for the event at which he was speaking: MSRI’s 25th Anniversary Celebration, held at the Institute from January 26 through 30.

While the celebration couldn’t offer the luxury of 80 afternoons of conversation, its five days presented a panoramic view of what makes MSRI such a richly stimulating place in which to work. In addition to a series of mathematical talks by leaders of MSRI programs, past and future, the celebration featured a conversation about mathematics and music, a panel on education, and discussions of the history of the Institute and the choices that made MSRI what it is today.

“MSRI is a resource with a glorious past and a bright future,” said Robert Bryant, our director, at the celebration’s inaugural reception. “The presence of so many good friends of MSRI makes this event especially significant and historical.”

At the heart of the celebration was a panel discussion entitled “MSRI: Past, Present and Future,” in which seven mathematicians who have been closely connected with MSRI offered congratulations on its accomplishments, reflections on its mission and history, and challenges for the future.

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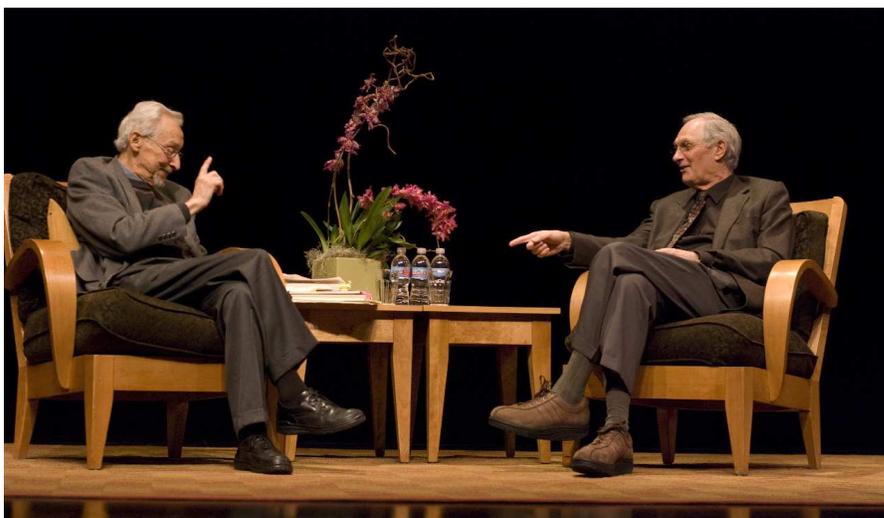


Dan Miller

Inez Fung (UC Berkeley) gave a talk at the 25th Anniversary symposium (see page 6 for details). Fung was also an organizer and main speaker for MSRI’s symposium on the Mathematics of Climate Change last year, which included a public event in San Francisco attended by over 1000 people, and for the MSRI Climate Change Summer School in July 2008, which included a research and a graduate workshop.

Alan Alda does M*A*T*H

Besides many accomplished roles on stage, screen, and television—his Senator Vinick character in *The West Wing* boasts his own Wikipedia page — Alan Alda hosted PBS’s *Scientific American Frontiers* for eleven years. His deep and genuine interest in science was on display when he took the stage of the Roda Theatre in Berkeley with mathematician Bob Osserman of MSRI, in a fascinating and wide-ranging public conversation that dwelt on curved space-time, new math, marriage, Richard Feynman, public perceptions of science, and much more. Watch the friendly duel of wits at <http://tinyurl.com/6xw59p>.



David Eisenbud

Promoting Diversity at the Graduate Level in Mathematics: A National Forum

That was the name of an MSRI conference held October 14–17, and meant as one tool in the Institute’s longstanding program to help increase diversity and broaden the participation of underrepresented groups in the mathematical sciences — goals that the National Science Foundation has called “essential components of the innovation engine that drives” the American economy.

The conference’s focus was on identifying and stimulating successful models that improve retention of underrepresented groups in graduate programs in mathematics, and more specifically:

- to bring together representatives of key constituencies involved in graduate education: graduate departments, graduate students, and faculty from small colleges, including minority-serving and women’s colleges, in order to develop strategies for improved retention of students from these institutions;
- to enable departments at research universities to articulate their expectations of students enrolled in their graduate programs;
- to enable departments at small colleges to better prepare their students for the demands of graduate education;
- to develop new ideas and disseminate strategies of programs and advisors that have been effective in producing doctorates among women and in other underrepresented groups;
- to demonstrate the mathematical achievements of women and minority mathematicians and provide networking opportunities for students and faculty.

The first day of the conference was directed at graduate students and young faculty, and highlighted the achievements of women and other underrepresented groups. Panel discussions and workshops focused on certain critical transition points in a mathematician’s professional development. There were panels on “Departments with Exemplary Records,” “The Students’ Perspectives,” and “A Tale of Two Cultures.” Break-out sessions explored ways to better



Shirley Malcolm

Shirley Malcolm

collaborate in advising undergraduates and in providing support for graduate students that will facilitate transition, increase retention, and improve student success.

Representatives of graduate departments and small colleges joined the conference for the last two days. The conference concluded with the identification of lessons learned and plans for action and dissemination.

The event was funded by the National Science Foundation and the National Security Agency. The organizers were Sylvia Bozeman (Spelman College), Rhonda Hughes (Bryn Mawr College), Abbe Herzig (SUNY at Albany), Duane Cooper (Morehouse College), Ellen Kirkman (Wake Forest University), Ivelisse Rubio (University of Puerto Rico), and Olivia Scriven (Spelman College).

Bozeman and Hughes have been tireless in their efforts to help young women and minorities achieve success in graduate mathematics, having developed two national programs devoted to that goal — the Spelman / Bryn Mawr Summer Mathematics Program and EDGE (Enhancing Diversity in Graduate Education).



David Cole



Shirley Malcolm



Shirley Malcolm

Sylvia Bozeman, Rhonda Hughes (organizers); Ellen Kirkman; Emille Davie, Laura DeMarco, Alina Cojocau, Garikai Campbell

US Competes in Chinese Girls Mathematics Olympiad

Alison Miller

The China Girls Math Olympiad (CGMO) is a competition for high school girls that was started in China in 2001 to encourage more girls to excel in mathematics and compete on their International Math Olympiad team. It began as a regional competition, but after a few years the organizers decided to invite teams from other countries. In 2007 the United States was able to take the CGMO up on its invitation for the first time, and did so again in 2008.

We selected eight talented high-school girls each year based on their performance in the previous USA Math Olympiad. For the 2007 competition in Wuhan, the USA was represented by Sway Chen, Sherry Gong, Wendy Hou, Jennifer Iglesias, Colleen Lee, Patricia Li, Marianna Mao, and Wendy Mu. For the 2008 competition in Zhongshan the team included Wendy Mu, Colleen Lee, Jennifer Iglesias, Carolyn Kim, Jenny Jin, Joy Zheng, Lynnelle Ye, and Inyoung Cho. The coaches were Zuming Feng, Melanie Wood (2007), Maria Monks (2008) and I.

The girls attended the AwesomeMath summer program in Dallas, TX, to train for the 2007 Olympiad. They studied geometry and algebraic inequalities, topics that Feng considered to be most useful for the CGMO, in daily lectures and problem sessions. They also had a lot of fun with their free time, running, swimming, playing games, and just hanging out. The 2008 team's training camp was the Mathematical Olympiad Summer Program in Lincoln, NE.

We arrived in China several days before each competition to adjust to the time difference and see the sights, of Beijing in 2007 and of Hong Kong in 2008. The format of the competition was the same each year. The opening ceremony featured a parade of teams and speeches in Chinese, accompanied by a PowerPoint summary in English. The next two days were the competition. Each day, the girls had four hours to work on four problems. Here is an example:

4. *The set S consists of $n > 2$ points in the plane. The set P consists of m lines in the plane such that every line in P is an axis of symmetry for S . Prove that $m \leq n$, and determine when equality holds.*

The problems turned out to be harder than everyone had expected, but unlike the USA Math Olympiad, answers qualified for partial credit.

In 2007 Sherry Gong was given a gold medal (she tied for the top score at the competition), Wendy Hou received a silver medal, and Patricia Li, Marianna Mao, and Wendy Mu got bronze. In 2008 Carolyn Kim, Jenny Jin, Inyoung Cho, Colleen Lee, and Joy Zheng earned bronze medals, Wendy Mu earned a silver medal, and Jenny Iglesias and Lynnelle Ye earned gold medals. We were all very proud and happy with our results.

Following the competition we had time for sightseeing in other parts of China. In 2007 we spent a couple of days in Xi'an seeing the many historic sights, including the terracotta army. In 2008 we went to Shanghai, and in addition to visiting historic sights we went to an Olympic soccer game!

Although we were eager to return home after so long, the girls knew they would all miss each other. All in all, it was an amazing experience for everyone, and I believe it has encouraged the girls to pursue mathematics further.

The American GMO team is sponsored by MSRI, with support from the Mathematical Association of America, the IBM Almaden Research Center (2007), the Akamai Foundation, the Intel Foundation (2008), the Shing-Shen Chern Foundation, and the Sunlin and Priscilla Chou Foundation. The team has a website, with the competition problems and a blog, at <http://msri.org/specials/gmo>.



The 2007 team (above) and the 2008 team (below).



MSRI Turns 25

(continued from page 1)

Rising Above Resistance

The creation of MSRI was deeply controversial, the panelists recalled. Some mathematicians feared that new institutes would drain too much money from an already insufficient NSF mathematics budget. Yet by the 1970s, the need for another mathematics institute besides the Institute of Advanced Studies (IAS) in Princeton was becoming increasingly clear.

“Many of us in the fifties and sixties had had career-shaping experiences at IAS, and that’s something we wanted to provide the next generation of mathematicians, but the mathematical community had expanded,” said Calvin Moore, who co-founded MSRI with Isadore Singer and the late Shiing-Shen Chern. “Expanding the IAS wouldn’t work, because there’s a size limit beyond which an institute loses focus and richness of experience.”

To try to offer such experiences to more mathematicians while still husbanding mathematics funds, the NSF’s mathematics advisory committee passed a resolution in 1977 in favor of creating a new institute — but only if it was funded by “new money.”

By 1979, however, the NSF decided to solicit applications for a new institute, even though the question of where the money would come from was still unresolved. At a meeting on May 22, 1981 the National Science Board approved the creation of two new institutes: MSRI, and the Institute for Mathematics and Its Applications, at the University of Minnesota.

“I can’t convey to you the level of anxiety at that meeting,” said Alvin Thaler, the NSF program director who oversaw MSRI’s formation. “No one knew how it was going to turn out until the final show of hands.”

In a compromise, the NSF agreed to add enough new money to the mathematics budget to cover half the cost of the new institutes, with the remainder coming from the existing budget.

MSRI’s resounding successes during the years that followed quickly won over skeptics. At the 25th anniversary celebration, several younger mathematicians cited the formative influence MSRI had on their development as mathematicians, and expressed surprise that its founding could have generated controversy.

“MSRI has always been a shrine to mathematicians of my generation,” said Tony Chan, who heads the NSF’s Math and Physical Sciences Directorate. “It was up there on the hill, and you made your pilgrimage.”

To anyone still wondering about the wisdom of spending part of the precious NSF mathematics budget on an institute, David Eisenbud, MSRI’s director from 1997 to 2007, offered a telling statistic: of every dollar spent to support mathematicians who come to MSRI, only 20 cents come from MSRI, the rest from the mathematics community. “About 2000 people come here each year, but the resources MSRI has don’t bring them here — they bring themselves

here using other resources,” he said. “Why is the community providing 80% of the resources? Because they are convinced that it leads to more mathematics and better connections to society.”

MSRI capitalizes on the enthusiasm of the community to make mathematics happen, said Eisenbud, who is now at the University of California, Berkeley.

“When people come in to form a program, after a while they remember vaguely that the director occasionally looked in on them, but what they really remember is working with each other,” he said. “We [at MSRI] form the climate and let it happen, with all the help we can give it, but the major thrusts are from the people who come here, and what they do.”

The Early Years

MSRI’s founders and the funding officers at NSF made several key decisions that have shaped the nature of the Institute, the panelists reflected. In contrast to IAS, MSRI has no permanent members; instead, each program brings in the leaders of a given field for a semester or a year. Although this choice was rooted in simple pragmatism — “We couldn’t afford any permanent members,” Singer explained — it has created a dynamic, energetic research environment.

“Worldwide, institutes tend to go stale, because there’s not enough biological function to renew them,” Moore said. He quoted Nobel physicist Emilio Segrè, who, upon hearing of MSRI’s structure, replied, “Aha! You have found the fountain of youth.”

MSRI’s founders also decided, crucially, that MSRI should be independent of the University of California. They felt, Moore said, that mathematicians would find the Institute more appealing “if they could visibly see that the government of the Institute was vested in the mathematics community.” Thus, MSRI began as a consortium of nine universities, and quickly welcomed more academic sponsors into the fold — there are now 93 (see page 8).

The fact that UC Berkeley did not own MSRI was “one of the great design principles of the early Institute,” Eisenbud said. “It was set up in a way that more people could sign on easily, and I think that remains one of the great strengths of the place.”

MSRI is also unusual in that the scientific advisory committee — which chooses the academic programs for each year, and which comprises mathematicians from all over the country — is truly independent of MSRI’s directors and staff, said Alejandro Adem, of the University of British Columbia in Vancouver, who was a committee co-chair for many years.

“I remember a time when David [Eisenbud] and the committee were arguing about something, and a member said, ‘Okay, David, you’ve said enough, now please be quiet and we’ll decide,’” he recalled. “I don’t know many institutes where that happens.”

The scientific advisory committee has made some prescient choices of program topics over the years, Eisenbud said. One early example was the decision in the 1984-85 academic year to run simultaneous programs on operator algebras and low-dimensional

topology, creating synergies that led to several of Vaughn Jones' now-famous discoveries about the Jones polynomial.

In a more recent example, in the late 1990s, "the committee chose a random matrix program, with inspiring foresight, before it even was a subject," Eisenbud said. "That was one of the most successful things that happened in my time."

Reaching Out

The efforts of MSRI's founders and its first two directors, Chern and Irving Kaplansky, established MSRI as a premier research institute. William Thurston's years as director, from 1992 to 1997, were marked by a series of outreach efforts that, over the years, have become a growing part of its mission, said Lenore Blum, of Carnegie Mellon University in Pittsburgh, who served as a deputy director during much of Thurston's tenure.

"This was the period in which MSRI really opened its doors and became a center of mathematics for the whole mathematics community and beyond," Blum said.

Blum told the behind-the-scenes story of MSRI's first event for the general public: Fermatfest, held on July 28, 1993 to commemorate Andrew Wiles' announcement that he had proved Fermat's Last Theorem. Wiles' announcement had generated a lot of media coverage, and Thurston, Blum and Robert Osserman, then also a deputy director, were eager to build on this momentum. In what Blum called a "gamble," they decided to hire a theater in the Palace of Fine Arts that seats 1000 people.

"We wondered whether we would have this huge hall and then no one would show up," she recalled. In the event, their gamble more than paid off: Thousands of people tried to attend, and scalpers had "a field day," Blum said. "They were reselling our five dollar tickets for \$50."

The San Jose Mercury News called the event, which featured technical talks interspersed with Tom Lehrer songs, "the hottest math show in town."

"I think one of the reasons it was so successful is that we took it really seriously, and tried to give some of the content of the proof," Blum said.

Since that time, MSRI has regularly hosted events for the public, most notably Osserman's conversations on mathematics and the arts with such celebrities as Alan Alda, Tom Stoppard, and Steve Martin. "Those have been a hallmark for MSRI," Blum said.

In a happy accident of scheduling, one such event took place on the inaugural afternoon of the 25th anniversary celebration. Osserman discussed the relationship between mathematics and music with David Benson, author of the book *Music: A Mathematical Offering*, and pianist Christopher Taylor, who was to perform Messiaen's monumental piano work *Vingt Regards sur l'Enfant Jésus* on the UC Berkeley campus the following afternoon. Messiaen was fascinated by numbers, Taylor said, and he embedded many mathematical ideas in this piece, from chords that were repeated a prime number of times to scales that have symmetries under particular transposition groups.

In addition to events for the public, during the Thurston years MSRI also reached out to students, teachers, and groups that have historically been underrepresented in the mathematical community. It was during this time that MSRI started holding summer workshops for graduate students and introductory workshops at the start of its programs. MSRI also held its first workshop for women in mathematics in 1993, and its first conference for African American mathematicians in 1995. At the latter conference, "many people commented that they never knew that there were so many people like themselves who were interested in mathematics," wrote conference co-organizer Raymond Johnson, of the University of Maryland, in the December 1995 *Notices of the American Mathematical Society*.

During these years, MSRI also began hosting conversations between math teachers and researchers, Blum recalled. "In the normal course of events, these two groups, who have a lot of common interests, have no way to get together," Blum said. The conversations didn't skirt controversy, she said, covering such contentious topics as whether the study of proofs in high school geometry is obsolete and whether the elimination of tracking will help or hinder the development of quality mathematicians.

Over the past decade, MSRI has greatly expanded its education outreach efforts, mathematicians said at a panel discussion on MSRI's educational activities at the 25th anniversary celebration. These activities include "Math Circles" for mathematically gifted high school and middle school students, summer institutes for elementary and middle school teachers, and, most recently, a summer research program for minority and women undergraduates that held its first session last year.

Starting in 2004, MSRI has also held a series of workshops on education, covering such topics as student assessment and teaching mathematics to teachers. These well-attended workshops have followed the model of MSRI's scientific workshops, said Hyman Bass, of the University of Michigan in Ann Arbor: the workshops try to address issues of central importance, enlist the best expertise available to design the workshop, invite a selection of the field's main contributors, and aim for a synthesis that helps advance the field. "The idea is to do something that is consistent with the culture and strengths of an institution like MSRI, and that contributes something worthwhile to the educational enterprise," he said.



Christopher Taylor (left) and David Benson explore music & math

Looking Forward

The 25th anniversary also featured 16 scientific talks on a spectrum of topics that have been featured in MSRI programs over the decades. Reflecting MSRI's core mission, most of the subjects were drawn from pure mathematics, ranging from topological field theories to Galois representations (a complete program is available at <http://www.msri.org/25>). At the same time, the program also highlighted MSRI's growing commitment to promoting interdisciplinary research.

Inez Fung, of the University of California, Berkeley, discussed global climate models, which present a wide variety of mathematical challenges. In recent years, MSRI has launched efforts to bring together climate researchers and mathematicians, holding a graduate student workshop in 2006, and a two-day symposium on global warming in 2007. "MSRI has stimulated a whole new endeavor," Fung says.

In view of the success of these events, MSRI hosted in July 2008, with major support from the Sea Change Foundation, a three-week workshop for graduate students on the mathematics of climate prediction, and an accompanying research workshop. "We see this as the beginning of a larger and longer-lived initiative to get the mathematics community engaged in climate research," said Chris Jones, of the University of North Carolina in Chapel Hill, who is one of the workshop's organizers. The mini-program was designed to introduce students and postdocs to a set of mathematical ideas and techniques that are highly relevant to climate change research.

Fostering connections between mathematicians and other scientists is one of the most important new tasks that fall to MSRI, Chan said.

"Looking forward, the Institute can play a big leadership role in shaping the scientific landscape," he said. "You are the eyes and ears for the community, the leading edge of some of the things coming through the community."

Olympic "Mathletes" Meet California Governor

June 12, 2008: MSRI's 2008 BAMO (Bay Area Mathematical Olympiad) winners meet with Governor Arnold Schwarzenegger in the State Capitol in Sacramento. Left to right, front row: Robert L. Bryant, MSRI Director, Spencer Yee, Nickolai Whitlow, Jing Jing Li, Governor Arnold Schwarzenegger, Jenny Thompson, Patricia Li, Lewis Chen, and Zvezdelina Stankova, BAMO Co-Director. Back row: David Spies, Timothy Chu, Joseph Chu, Yanping Chen, Robert Nishihara, and Nathan Pinsker. Photography by Peter Grigsby, courtesy the Office of the Governor.



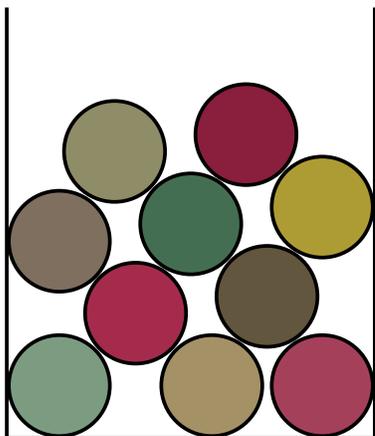
Puzzles Column (food lovers' edition)

Elwyn Berlekamp and Joe P. Buhler

1. Your younger brother cuts a rectangular piece R out of a rectangular brownie B . Your job is to divide the complement $R-B$ into two exactly equal pieces to share with your older sister. Unfortunately the rectangle B doesn't have its sides aligned with the sides of R , and isn't centered in R . How should you proceed?



2. You have 13 identical wine bottles that must be stored in a box whose width is somewhat larger than the width of 3 of the bottles. The placement of the first 10 bottles is given, in cross-section, in the figure. Prove that, no matter where the middle bottle in the bottom row happens to have been placed, the final top row of 3 bottles will be horizontal.



Comment: We saw this problem on the Problem of the Fortnight web site at San Diego State University; it appeared earlier in *Which Way did the Bicycle Go?* by Konhuaser, Velleman, and Wagon, where it is attributed to Charles Payan, the creator of the CABRI geometry software. Apparently the result was discovered while experimenting with the software.

3. Prove that there is no equilateral triangle in the plane whose vertices are at integer lattice points (x, y) .

4. If P and Q are smooth potatoes, prove that there is a closed curve on P and one on Q that are congruent as curves in 3-space.



Comment: This charmer can be found in many places. We took it from *Mathematical Mind-Benders*, Peter Winkler's new book

of recreational puzzles for mathematicians. An entire chapter of that book is devoted to the now classical genre of ant puzzles, which we have visited in earlier *Emissary* columns still available at MSRI's web site (Fall 2003, Spring and Fall 2004). Here is a new one from Winkler's book:

5. Twenty-five ants are placed randomly on a one-meter rod. Aunt Alice is the middle ant, i.e., she has twelve ants on either side of her. The ants randomly choose a starting direction and crawl at 1 cm/sec; whenever two collide they reverse direction. When they reach the end of the rod, they fall off. Suppose poor Aunt Alice has a cold, which is transmitted between ants at any collision. How many ants will be infected on average?

6. Let m and n be positive integers. If A and B are dice with n faces, each labeled with a real number, then write $A_m > B_m$ if the probability is larger than 0.5 that the sum of m rolls of A exceeds the sum of m rolls of B . (We assume that each face is equally likely.)

(a) Find dice A , B , and C such that

$$A_1 > B_1 > C_1 > A_1.$$

(b) Find dice that satisfy the previous condition *and* the condition

$$A_2 < B_2 < C_2 < A_2.$$

Comment: Solutions to (a) are called *intransitive dice* and were popularized in a 1970 Martin Gardner column in *Scientific American*. Doubly intransitive dice, the object of part (b), were brought to our attention by Ron Graham, who has a number of surprising results about generalizations. Note that with such dice you can win, on average, even giving your opponent second choice of dice, if you are allowed to choose the number of throws that are totaled.

7. Given an initial sum of x dollars, for some real number x , you play the following game. A card is selected randomly from each of n ordinary decks of cards. These n cards are placed in a face-down stack and are turned over one at a time. Before each card is turned over you may wager any fraction of your stake on the color of the card, double or nothing.

So far, this describes a fair game (and in fact your expected return is independent of your strategy). However, you are allowed one additional move: at the beginning you can opt to pay y dollars of your initial stake to see all n cards. These n cards are then shuffled and the game proceeds as above.

What value of y should you be willing to pay for this privilege?

Comment: This problem was posed to us by David Moulton.

Annual Gauss Society Dinner

Jim Sotiros

MSRI's Gauss Society was established with a \$500,000 bequest from MSRI's first director and co-founder Shiing-Shen Chern. The Gauss Society exists to encourage and recognize donors of planned gifts that help build MSRI's endowment. The Gauss Society is chaired by the University of Washington's Doug Lind.

The Gauss Society held its first recognition dinner on Saturday, January 6, 2007 at Galatoire's Restaurant on Bourbon Street in New Orleans' French Quarter, during the AMS/MAA Joint Meetings. The second recognition dinner was held at the Joint Meetings in San Diego at JSix restaurant on Monday, January 7, 2008.

Tulane University's Ricardo Cortez spoke at the first dinner on MSRI-UP, the new undergraduate program at MSRI. Cortez is also co-chair of MSRI's Human Resources Advisory group.

The second dinner featured Moon Duchin, postdoctoral researcher at University of California, Davis. Moon spoke on "Lengths on Flat Surfaces, and MSRI as Think Tank". Duchin was a MSRI Postdoctoral Scholar with the Teichmüller Theory and Kleinian Group Program in 2007.

The Gauss Society recognizes mathematicians and others who have established planned gifts that benefit the Institute endowment fund. Wills, bequests, 403(b)'s, and planned giving instruments like Charitable Remainder Trusts are welcomed.

For questions, or to notify MSRI that you have made estate plans that benefit the Institute's endowment, please contact jsotiros@msri.org or call 510-643-6056.

The next MSRI Gauss Society Recognition Dinner is being planned for January 2009 in Washington, DC. Members will be sent invitations shortly.



At the second Gauss Society dinner: Bill Lang (Brigham Young University), Robert Bryant, Hyman Bass (University of Michigan, in the background), Ricardo Cortez (Tulane University).

Academic Sponsors Increase Tenfold

MSRI now boasts 91 Academic Sponsors, a number of them outside the United States. Thus the number of universities and other academic institutions that contribute to MSRI's support and have a say in its future is now more than ten times what it was at the beginning.

For the benefits of academic sponsorship, see www.msri.org/sponaff/Academic_Benefits.

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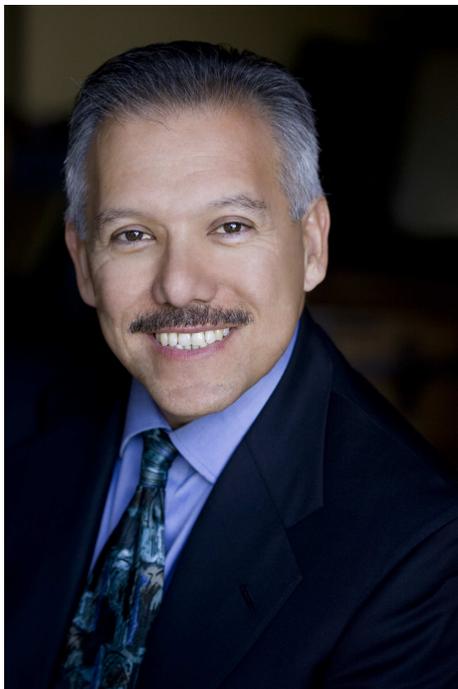
David Eisenbud

Juan Meza Wins Blackwell–Tapia Prize

The 2008 Blackwell–Tapia Prize was awarded to Dr. Juan C. Meza, Department Head and Senior Scientist for the High Performance Computing Research Department at Lawrence Berkeley National Laboratory.

This prize is awarded every second year in honor of the legacy of David H. Blackwell and Richard A. Tapia, two distinguished mathematical scientists who have been inspirations to more than a generation of African American, Latino/Latina, and Native American students and professionals in the mathematical sciences. It recognizes a mathematical scientist who has contributed and continues to contribute significantly to research in his or her field of expertise, and who has served as a role model for mathematical scientists and students from underrepresented minority groups or contributed in other significant ways to addressing the problem of the underrepresentation of minorities in mathematics.

Dr. Meza has a distinguished record as a mathematical scientist, an accomplished and effective head of a large department doing cutting-edge explorations in the computational sciences, computational mathematics, and future technologies, and a role model and active advocate for others from groups underrepresented in the mathematical sciences. As a mathematician, his current research focuses on nonlinear optimization with an emphasis on methods for parallel computing, and he has also worked on various scientific and engineering applications including scalable methods for nanoscience, power grid reliability, molecular conformation problems, optimal design of chemical vapor deposition furnaces, and semiconductor device modeling. He is a much sought after speaker, both nationally and internationally, on topics ranging from his own research, through major invited talks on the importance of diversity such as his presentation as the 2008 Marjorie Lee Browne Colloquium Speaker for the University of Michigan's Martin Luther King celebration, and advice important to young mathematicians-in-the-making such as his presentations to student groups on how they can be effective speakers and presenters themselves. His record of service to communities underrepresented in mathematics includes chairing the Mathematical Sciences Research Institute (MSRI) Human Resources Advisory Committee, co-chairing the annual Diversity Day workshops of the Society for Industrial and Applied Mathematics, and many other activities too numerous to mention here; however, they regularly extend from serving on high-level advisory committees on diversity for major scientific organizations, through rolling up his own sleeves and working directly with early-career mathematics students from underrepresented groups, as he did in the 2007 MSRI Undergraduate Program (MSRI-UP).



Dr. Meza also received the 2008 Distinguished Scientist Award from the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), presented on October 9 at the 2008 SACNAS National Conference in Salt Lake City.

The prize will be presented at the Fifth Blackwell–Tapia Conference, to be hosted by the Statistical and Applied Mathematical Sciences Institute (SAMSI) in Research Triangle Park, NC on November 14–15, 2008; see www.samsi.info/workshops/2008Blackwell-Tapia.shtml for more information. The one and a half day meeting will include a mix of activities designed to inform the next generation of students about career opportunities in mathematics and to provide a chance for them to network with other students and with mathematical scientists who play a leadership role in their communities.

The committee awarding the prize was chaired this year by Rodrigo Bañuelos, Professor and Department Head of Mathematics at Purdue University and 2004 recipient of the Blackwell–Tapia Prize, and William A. Massey, Edwin S. Wiley Professor of Operations Research and Financial Engineering at Princeton University and 2006 recipient of the same prize. The other members were SAMSI Director James Berger; MSRI Director Robert Bryant; Carlos Castillo-Chavez, Regents Professor, and Joaquin Bustoz Jr., Professor of Mathematical Biology at Arizona State University; and (ex officio) Ricardo Cortez, Duren Professor of Mathematics at Tulane University and Chair of the MSRI Human Resources Advisory Committee; David Eisenbud, Professor of Mathematics at the University of California at Berkeley; and Robert Megginson, Arthur F. Thurnau Professor of Mathematics and Associate Dean of the College of Literature, Science, and the Arts at the University of Michigan.

The first four Blackwell–Tapia conferences were held at Cornell University (2000), MSRI (2002), the Institute for Pure and Applied Mathematics (IPAM) in Los Angeles (2004), and the Institute for Mathematics and its Applications in Minneapolis (2006). The conference arose from discussions in the MSRI Human Resources Advisory Committee when Carlos Castillo-Chavez was a member. A proposal by him to David Eisenbud, then MSRI Director, resulted in a collaboration between Cornell and MSRI on the first Blackwell–Tapia Conference, which had the specific purpose of honoring Blackwell and Tapia. The success of this conference led directly to the second in the series and the first awarding of the Blackwell–Tapia Prize at MSRI in 2002, with the goal of extending the honoring of these two eminent mathematical scientists to those who have followed in their footsteps.

MSRI-UP 2008: Experimental Mathematics

MSRI-UP is a comprehensive program for undergraduates that aims at increasing the number of students from underrepresented groups in mathematics graduate programs. MSRI-UP includes summer research opportunities, mentoring, workshops on the graduate school application process, and follow-up support.

The 2008 MSRI-UP program ran from June 14 to July 27 and was organized by Ivelisse Rubio (University of Puerto Rico, Humacao), Duane Cooper (Morehouse College), Ricardo Cortez (Tulane University), Herbert Medina (Loyola Marymount University), and Suzanne Weekes (Worcester Polytechnic Institute).

Eighteen students participated in research on Experimental Math-

ematics led by Dr. Victor Moll from Tulane University, a post-doc and two graduate assistants. Each student received room and board, a \$3000 summer stipend, transportation to and from Berkeley, and funding to attend a national conference.

The goal of MSRI-UP is to train undergraduates in mathematical research, provide participating students opportunities to present their research at national conferences in the year following the summer program, introduce participating students to a network of mentors through national societies known for their mentoring activities and professional support for students, and guide students in the process of applying to graduate programs and fellowships.



The previous year's MSRI-UP program exposed students to computational mathematics.

MSRI Noon Concerts Resume

On October 14 at noon, MSRI had the pleasure of hosting a performance by the world-renowned St. Lawrence String Quartet. The SLSQ (as they call themselves — see www.slsq.com) was formed in Toronto twenty years ago, and has been the quartet-in-residence at Stanford University since 1998. They have received rave reviews from many top critics, and several important composers — including, most recently, John Adams — have composed string quartets especially for them. They maintain a very active international touring schedule, but as part of their arrangement with Stanford they perform occasionally in smaller venues around the Bay Area. The quartet's members are Geoff Nuttall and Scott St. John (violins), Lesley Robertson (viola) and Christopher Costanza (cello).

The point of contact with the quartet was a fortuitous accident: current MSRI member Rafe Mazzeo is Robertson's next door neighbor. She once asked Rafe whether "this math institute you're spending time at has a good auditorium", and the answer to that was easy! After a quick conversation with MSRI Director Robert Bryant, who knew the group's work very well, having brought them to Duke in his former capacity as director of the Chamber Arts Society of Durham, arrangements were quickly finalized.

The program that day, Haydn's Op. 77, No. 2 and Dvorak's Op. 106, was enjoyed by a sizable audience. After their performance, the musicians enjoyed the views and lunch, then headed back to Stanford to teach their afternoon classes.



Anthony Parnelle

Forthcoming Workshops

Most of these workshops are offered under the auspices of one of the current programs. For more information about the programs and workshops, see www.msri.org/calendar.

December 11, 2008 to December 12, 2008: *Using Partnerships to Strengthen Elementary Mathematics Teacher Education*, organized by Deborah Ball (University of Michigan), James Lewis (University of Nebraska), and William McCallum (University of Arizona)

December 15, 2008 to December 18, 2008: *Algebraic Statistics*, organized by Serkan Hosten (San Francisco State U.), Lior Pachter (U. C. Berkeley), Bernd Sturmfels (U. C. Berkeley)

January 22, 2009 to January 24, 2009: *Connections for Women: Algebraic Geometry and Related Fields*, organized by Angela Gibney (U. Pennsylvania), Brendan Hassett (Rice U.), Sándor Kovács (U. Washington), Diane Maclagan (Warwick U.) Jessica Sidman (Mt. Holyoke), and Ravi Vakil (Stanford U.)

January 26, 2009 to January 30, 2009: *Classical Algebraic Geometry Today*, organized by Lucia Caporaso (U. Rome III), Brendan Hassett (Rice U.), James McKernan (MIT), Mircea Mustata (U. Michigan), Mihnea Popa (U. Illinois - Chicago)

February 03, 2009: *Macaulay Day: Using Macaulay 2 in Your Research*.

February 23, 2009 to February 27, 2009: *Modern Moduli Theory*, organized by I. Coskun (U. Illinois - Chicago), S. Katz (U. Illinois), A. Marian (Institute for Advanced Study), R. Pandharipande (Princeton U.), R. Thomas (Imperial College), H. H. Tseng (U. Wisconsin), R. Vakil (Stanford U.)

March 09, 2009 to March 12, 2009: *Sage Days: Algebraic Geometry*, organized by David Eisenbud (U. C. Berkeley), Daniel Erman (U. C. Berkeley), Dan Grayson (University of Illinois at Urbana-Champaign), Mike Hansen (University of Washington), William Stein (University of Washington), Mike Stillman (Cornell University).

March 23, 2009 to March 27, 2009: *Combinatorial, Enumerative and Toric Geometry*, organized by Michel Brion (U. de Genoble), Anders Buch (Rutgers U.), Linda Chen (Ohio State U.), William Fulton (U. Michigan), Sándor Kovács (U. Washington), Frank Sottile (Texas A&M), Harry Tamvakis (U. Maryland), and Burt Totaro (Cambridge U.)

April 13, 2009 to April 15, 2009: *Symposium on the mathematical challenges of systems genetics*, organized by Rick Woychick (Director, The Jackson Laboratory) Robert Bryant (Director, MSRI) David Galas (Institute for Systems Biology) Arnold Levine (Institute for Advanced Study) Lee Hood (Institute for Systems Biology) Gary Churchill (The Jackson Laboratory)

June 15, 2009 to July 24, 2009: *MSRI-UP 2009: Coding Theory*, organized by Ivelisse Rubio (University of Puerto Rico, Humacao), Duane Cooper (Morehouse College), Ricardo Cortez (Tulane University), Herbert Medina (Loyola Marymount University), and Suzanne Weekes (Worcester Polytechnic Institute)

August 14, 2009 to August 15, 2009: *Connections for Women: Symplectic and Contact Geometry and Topology*, organized by Eleny Ionel (Stanford University), Dusa McDuff (Barnard College, Columbia University).

August 17, 2009 to August 21, 2009: *Introductory Workshop on Symplectic and Contact Geometry and Topology*, organized by John Etnyre (Georgia Institute of Technology), Dusa McDuff (Barnard College, Columbia University), and Lisa Traynor (Bryn Mawr)

August 21, 2009 to August 22, 2009: *Connections for Women: Tropical Geometry*, organized by Alicia Dickenstein (U. Buenos Aires), Eva Maria Feichtner (U. Bremen)

August 24, 2009 to August 28, 2009: *Introductory Workshop on Tropical Geometry*, organized by Eva Maria Feichtner (U. Bremen), Iliia Itenberg (U. Strasbourg), chair, Grigory Mikhalkin (U. Genève), Bernd Sturmfels (U. C. Berkeley)

October 12, 2009 to October 16, 2009: *Tropical Geometry in Combinatorics and Algebra*, organized by Federico Ardila (San Francisco State University), David Speyer (MIT), chair, Jenia Tevelev (U. Mass Amherst), Lauren Williams (Harvard)

November 16, 2009 to November 20, 2009: *Algebraic Structures in the Theory of Holomorphic Curves*, organized by Mohammed Abouzaid (Clay Mathematics Institute), Yakov Eliashberg (Stanford U.), Kenji Fukaya (Kyoto U.), Eleny Ionel (Stanford U.), Lenny Ng (Duke U.), Paul Seidel (MIT)

November 30, 2009 to December 04, 2009: *Tropical Structures in Geometry and Physics*, organized by M. Gross, K. Hori, V. Kharchlamov, R. Kenyon

Current and Recent Workshops

Most recent first. For information see www.msri.org/calendar.

December 08, 2008 to December 20, 2008 (Mexico City and Morelia): *International Conference on Cluster Algebras and Related Topics*, organized by Christof Geiss (UNAM Ciudad Universitaria), Bernhard Keller (Université Paris 7), Idun Reiten (Norges Teknisk-Naturvitenskapelige Universitet), Andrei Zelevinsky (Northeastern University).

November 03, 2008 to November 07, 2008: *Discrete Rigidity Phenomena in Additive Combinatorics*, organized by Ben Green (University of Cambridge), Bryna Kra (Northwestern University), Emmanuel Lesigne (University of Tours), Anthony Quas (University of Victoria), Mate Wierdl (University of Memphis)

October 27, 2008 to October 31, 2008: *Elliptic and Hyperbolic Equations on Singular Spaces*, organized by Gilles Carron, Eugenie Hunsicker, Richard Melrose, Michael Taylor, Andras Vasy and Jared Wunsch

MSRI Staff Roster

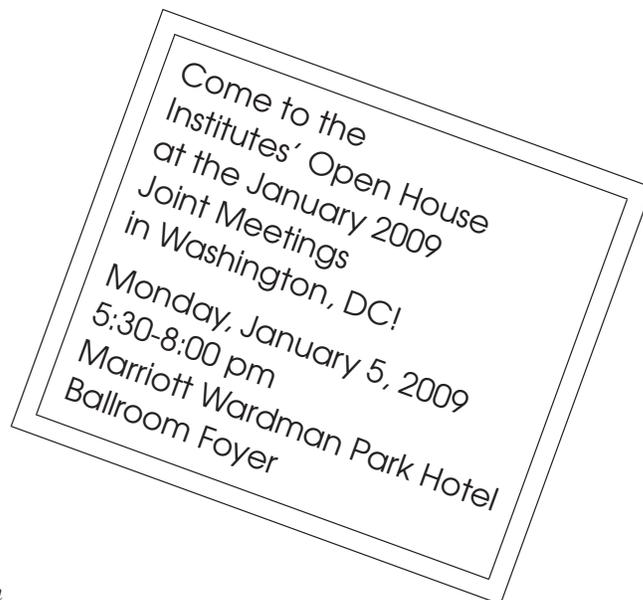
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