AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

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President's Report

Dear Colleagues:

I'm delighted to report that the Conference on Non-linear Phenomena in Mathematical Physics: Dedicated to Cathleen Synge Morawetz on her 85th Birthday, co-sponsored by AWM and the Fields Institute, has been a great success. Many thanks to the organizing committee, chaired by Irene Gamba, to the Fields Institute staff, and to AWM executive director Maeve McCarthy for writing the proposal that funded the conference. (For details and photographs, see page 5–6.) It seems appropriate in several ways that the conference occurred at the Fields Institute in Toronto. Morawetz is the first woman to direct a major mathematics institute in the United States. Barbara Keyfitz, the current director of the Fields Institute and one of the conference organizers, is the first woman to direct a mathematics institute in Canada. And Morawetz attended the University of Toronto as an undergraduate.

It's an additional pleasure to note that Ingrid Daubechies, Dusa McDuff, and Karen Uhlenbeck have joined Morawetz as honorary members of the London Mathematical Society.

The European Mathematical Society has given its quadrennial prizes to researchers under 35. Three of the ten recipients are women. Congratulations to:

- Olga Holtz (Technische Universität Berlin, Germany, and University of California, Berkeley)
- Laure Saint-Raymond (École Normale Supérieure, Paris)
- Agata Smoktunowicz (University of Edinburgh, Scotland, and Institute of Mathematics of the Polish Academy of Sciences)

IN THIS ISSUE

AWM
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The purpose of the Association for Women in Mathematics is

- to encourage women and girls to study and to have active careers in the mathematical sciences, and
- to promote equal opportunity and the equal treatment of women and girls in the mathematical sciences.

AWM was founded in 1971 at the Joint Meetings in Atlantic City.

The *Newsletter* is published bi-monthly. Articles, letters to the editor, and announcements are welcome.

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I am also happy to write that Suzanne Lenhart, one of AWM's past presidents, will be an associate director of the new National Institute for Mathematical and Biological Synthesis. Suzanne, a long-time member of the AWM Education Committee and organizer of many AWM workshops, will be guiding the institute's outreach, diversity and undergraduate education activities. Another past president of AWM, Jill Mesirov, is chief informatics officer of the Broad Institute (which focuses on using genomics in biomedicine) and directs its Computational Biology and Bioinformatics Organization. You may have seen her name recently in connection with the Integrative Genomics Viewer, which she describes as allowing a "Google Maps™-like view of integrative genomic data."

Hélène Barcelo is the new deputy director of the Mathematical Sciences Research Institute where, in October, "Promoting Diversity at the Graduate Level in Mathematics: A National Forum" will take place. Sylvia Bozeman, an AWM member-at-large, is one of its organizers. I will be attending along with Georgia Benkart (AWM president elect), Amy Cohen-Corwin, a past treasurer of AWM, and Cora Sadosky and Carol Wood—both past presidents of AWM.

You may remember Susan Landau's article about children and tenure (in that order) in Bettye Anne Case and Anne Leggett's book *Complexities.* Or you may have read her account in the November 2003 AWM *Newsletter* of how she came to combine technical work and policy. If you have heard her speak about public key cryptography, you might not be surprised to hear that she was interviewed about technological aspects of Internet surveillance on National Public Radio's "On the Media." She is also the subject of a profile in *Scientific American* which begins with an account of her project for the Westinghouse Science Talent Search.

Quite a different sort of media coverage has gone to Annalisa Crannell and Lisa Randall. Their photographs appear in the September 21 *New York Times Magazine* fashion section, but you may recognize their names from other contexts. In January, Crannell, a mathematician, received an MAA Haimo Award for Teaching. Randall, a physicist, was elected to the National Academy of Sciences in May.

During the summer, considerable media attention focused on a *Science* article entitled "Gender Similarities Characterize Mathematics Performance." Its first author is the psychologist Janet Hyde and another is Marcia Linn—who is a long-time co-author of mine. (You may remember the review of *Gender Differences in Mathematics* that she and I wrote for the AWM *Newsletter* several years ago.)

The media reception of Hyde et al.'s article illustrated some of the various ways in which statistics about test scores can be interpreted. The article is—

like many *Science* articles—a mere two pages long, so I will give only a very brief summary, hoping to pique your interest in reading the article for yourself if you have not done so already. The study involved statistical analysis of seven million scores on state mathematics tests for grades 2 to 11. Hyde and her colleagues reported on various statistics about the distributions of girls' and boys' test scores: "effect size" (a normed difference between two means) and VR (the ratio of variances). The main findings about the scores were, in summary, trivial gender differences in average scores and slightly more variability in boys' scores.

Much of the media coverage focused on the effect size, yielding headlines like "Girls' Math Skills Equal To Boys', Study Finds" (National Public Radio) and "Math Scores Show No Gap for Girls, Study Finds" (*New York Times*). The *Wall Street Journal* and the *National Post* of Canada focused on variability ("Boys' Math Scores Hit Highs and Lows," "Larry Summers' Revenge"). Some bloggers noted this difference in coverage, commenting that differences in reporters' knowledge of statistics might be part of the explanation. Media coverage seems to have traditionally focused on differences in means (often described as "gender gaps"). It may take some time for journalists to adjust to the idea that there may be no gap and to learn about measures of variability—which is the subject of lively discussion in the blogosphere.

Conjectures about greater male variability in humans and other animals date back to (at least) Charles Darwin and were not originally formulated in precise statistical terms. Conjectures of this sort, which came to be known as the variability hypothesis, sometimes included the assumption that such variability was solely due to genetic causes—"pure manifestations of heredity" or "innate aptitude." Early in the history of the variability hypothesis, it included the notion that the attributes in question might be both mental and physical—height and weight as well as intellectual powers. The physical attribute version seems to have been quashed by empirical evidence. Between 1913 and 1916, the psychologist Leta Hollingworth conducted several variability studies. In one of these, she measured length and weight of 2,000 newly born babies (whose physical measurements were presumably not affected by

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Student, unemployed, developing nations: $20
All foreign memberships: $10 additional for postage
Dues in excess of $15 and all contributions are deductible from federal taxable income when itemizing.
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Level 2a or 2b: $175/$150
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Sponsors:
Friend: $1000+ — Patron: $2500+
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See the AWM website for details.

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All members except family members receive a subscription to the newsletter as a privilege of membership. Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for $55/year ($65 foreign). Back orders are $10/issue plus shipping/handling ($5 minimum).

Payment
Payment is by check (drawn on a bank with a US branch), US money order, or international postal order. Visa and MasterCard are also accepted.

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AWM will accept advertisements for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Managing Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the* Newsletter *must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is $110 for a basic four-line ad. Additional lines are $13 each. See the AWM website for *Newsletter* display ad rates.

Newsletter deadlines
Editorial: 24th of January, March, May, July, September, November
Ads: February 1 for March–April issue, April 1 for May–June issue, June 1 for July–August issue, August 1 for September–October, October 1 for November–December, December 1 for January/February

Addresses
Send all **Newsletter** material **except ads and book review material** to Anne Leggett, Department of Mathematics and Statistics, Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; e-mail: leggett@member.ams.org; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Marge Bayer, Department of Mathematics, University of Kansas, 405 Snow Hall, 1460 Jayhawk Boulevard, Lawrence, KS 66045-7523; e-mail: bayer@math.ku.edu; fax: 785-864-5255. Send everything else, **including ads and address changes**, to AWM, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030; phone: 703-934-0163; fax: 703-359-7562; e-mail: awm@awm-math.org.

differences in societal attitudes about gender). She found no differences in variability between the genders—a result that was publicized in the *New York Times* in 1915.

Investigation of greater male variability in mental attributes has continued. In 1994, the psychologist Alan Feingold published a summary of studies of variability in scores for verbal, mathematical, and spatial tests in different countries, located via searches of electronic databases. Feingold concluded, "these results are not consistent with the purely biological interpretations of gender differences submitted by the pioneers of the greater male variability hypothesis. The consistent cross-national variations in VR [ratio of variances] indicate gender differences in variability that are found are attributable to cultural factors or the interactions between cultural and biological factors."

As evidenced by some of the responses to Hyde et al.'s *Science* article, the variability hypothesis for mathematics persists, together with the assumption that the variability in question is due to "innate aptitude." Despite that, women continue to accumulate honors and break new ground—in mathematics, and elsewhere.

Cathy Kessel
Berkeley, CA
September 28, 2008

Workshop Mentors Needed

Are you looking for an opportunity to be more active in AWM? Have you considered being a mentor at one of our workshops?

We're looking for volunteers to serve as mentors at the January AWM workshop, to be held January 7–8, 2009, in conjunction with the annual Joint Mathematics Meetings in Washington, D.C. Being a mentor for a graduate student or recent Ph.D. is incredibly rewarding.

If you'd like to help, contact our Executive Director, Maeve McCarthy at mlmccarthy@awm-math.org.

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AWM ONLINE

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Online Ads Info
Classified and job link ads may be placed at the AWM website.

Website
http://www.awm-math.org

AWM DEADLINES

NSF-AWM Travel Grants: February 1 and May 1, 2009

AWM Workshop at SIAM: January 12, 2009

NSF-AWM Mentoring Travel Grants: February 1, 2009

Sonia Kovalevsky High School Mathematics Days: February 4, 2009

AWM Essay Contest: February 27, 2009

Louise Hay Award: April 30, 2009

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Impressions of the Morawetz Conference

Irene M. Gamba, University of Texas

This past September the scientific community held a conference of great impact in non-linear analysis: *Non-linear Phenomena in Mathematical Physics: Dedicated to Cathleen Synge Morawetz on her 85th Birthday*; the venue was the Fields Institute in Toronto. This scientific meeting focused on the legacy of Cathleen S. Morawetz and the impact that her scientific work on transonic flow and the non-linear wave equation has had in recent progress on different aspects of analysis for non-linear wave, kinetic and quantum transport problems associated to mathematical physics. These are areas where the elements of continuum, statistical and stochastic mechanics and their interplay have counterparts in the theory of existence, uniqueness and stability of the associated systems of equations and geometric constraints.

It was a central event for the applied and computational analysis community focusing on Partial Differential Equations and it was remarkable in many aspects, with 20 distinguished speakers, 10 poster presentations, about 70 junior and senior participants and, of course, the participation of Cathleen Synge Morawetz.

It was also a great happy occasion, not only to celebrate her paramount contributions to the theory of non-linear equations in gas dynamics and their impact in the current trends of nonlinear phenomena in mathematical physics, but also to serve as an awareness session of current women's contribution to mathematics. Of those twenty speakers, seven were women whose research has been inspired from or carried the legacy of Morawetz work. The list of speakers and their topics may be found below (Sunny Canic, University of Houston, was unable to attend).

The conference was sponsored and partially funded by the Fields Institute and The Association for Women in Mathematics (AWM), through a generous grant from DoE and the enthusiastic support and funding provided by Barbara Keyfitz, the current Fields Institute Director.

Fields Institute, September 19, 2008: Left to right, bottom row: Peter Lax, Cathleen S. Morawetz and Louis Nirenberg. Top row, left to right: Christian Klingenberg, Irene M. Gamba, Barbara Keyfitz and Giu-Qiang Chen.

Fields Institute, September 19, 2008: Left to right, bottom row: Peter Lax, Louis Nirenberg, Cathleen S. Morawetz and Lia Bonsard. Second row: Daniela Lupo, Kevin Payne, and Gigliola Stafillani.

University of Toronto Faculty Club, September 19, 2008: Daniela Lup and Cathleen S. Morawetz

Claude Bardos, University of Paris VI, France
Remarks on Navier Stokes and Euler Equation

Lia Bronsard, McMaster University
On the Mixed State in Anisotropic Superconductors

Gui-Qiang Chen, Northwestern University
Shock Reflection-Diffraction Phenomena, Transonic Flow, and Free Boundary Problems

Costas Dafermos, Brown University
Hyperbolic Conservation Laws with Weak Dissipation

Susan Friedlander, University of Southern California
Energy Conservation and Onsager's Conjecture for the Euler Equations

Irene M. Gamba, The University of Texas at Austin
Sharp Estimates for the Boltzmann Equation

Manoussos Grillakis, The University of Maryland
Correlation Estimates and Applications to Schroedinger Equations

Yan Guo, Brown University
Boltzmann Equation in Bounded Domains

Tom Hou, CalTech
On the Stabilizing Effect of Convection in 3D Incompressible Flows

Izabella Laba, The University of British Columbia
Arithmetic Progressions in Sets of Fractional Dimension

Peter Lax, Courant Institute of Mathematical Sciences, New York University
Spectral Representation and Translation Representation

Louis Nirenberg, Courant Institute of Mathematical Sciences, New York University
Some Remarks on Nonlinear Second Order Elliptic Equations

Kevin Payne, Universita di Milano
Weak Well-posedness of the Dirichlet Problem for Equations of Mixed Elliptic-hyperbolic Type

Sylvia Serfaty, Courant Institute of Mathematical Sciences and Université Pierre et Marie Curie
From the Ginzburg-Landau Energy to Vortex Lattice Problems

Jalal Shatah, Courant Institute of Mathematical Sciences, New York University
The Method of Space-time Resonances

Gigliola Staffilani, MIT
Kato's Smoothing Effect for Solutions to the a Capillary Water-Wave Problem

Walter Strauss, Brown University
Two Problems: Nonlinear Wave Scattering and Plasma Stability

S.R.S. Varadhan, Courant Institute of Mathematical Sciences, New York University
Large Deviations for Random Walks in a Random Environment

Horng-Tzer Yau, Harvard University
Lower Bounds on the Blow-up Rate of the Axisymmetric Navier-Stokes Equations

MathFest 2008

Georgia Benkart, AWM President-Elect

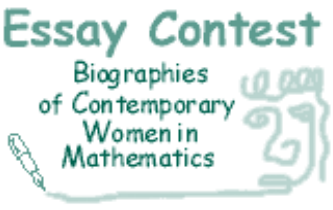
From the Hedrick Lectures, "Fun with Algorithms and Folding" by MacArthur Fellow Eric Demaine, to Elvis the dog's demonstration of max-min phenomena, MathFest 2008 offered a record crowd of over 1400 participants a varied and exciting mathematical program. Monona Terrace on the shore of Lake Monona in Madison, Wisconsin, was the site of the three-day conference held July 31–August 2, 2008. With her characteristic humor and energy, former AWM Executive Director Jenny Quinn welcomed participants to her Ph.D. home, Madison, as MC of the opening banquet. She concluded the evening event with a song of thanks to Larry Lesser for his banquet Math Song-Sing Along.

At the History of Math SIGMAA session, two new MAA posters were unveiled: *The Women of Mathematics,* which will be sent to mathematics departments across the country, and *Ethnomathematics: Exploring the Role of Mathematical Thought in Traditional and Indigenous Societies,* which will be distributed to all MAA members.

At each MathFest, AWM and MAA jointly sponsor the Etta Z. Falconer Lecture to recognize women who have made distinguished contributions to mathematics and mathematics education. The lecture series honors the memory of Dr. Etta Falconer for her lifetime contributions to mathematics and education and for her tireless efforts to increase the diversity of the U.S. scientific community. This year's lecturer, Rebecca Goldin (Associate Professor at George Mason University, Research Director at Statistical Assessment Service (STATS), and first recipient of AWM's Ruth Michler Prize), delivered a very well received talk entitled "The Use and Abuse of Statistics in the Media." [Ed. note: See following article.] Illustrating her points with numerous effective examples, Goldin urged a critical evaluation of statistical claims and a higher level of responsibility by the media. Listeners will probably never view statistical reporting in the same way again.

AWM hosted a luncheon in Goldin's honor at a nearby restaurant. Officers of MAA and AWM and others from the conference joined in celebrating her outstanding talk. AWM took the occasion to present Jenny Quinn with a plaque in recognition of her dedicated service and commitment to the organization as Executive Director from 2005 to 2007.

In 2007–08 Project NExT (New Experiences in Teaching) passed a noteworthy milestone when its 1000th fellow entered the program. Created by James Leitzel and Christine Stevens in 1994, Project NExT offers guidance and support for all aspects of the professional development of mathematicians beginning their academic careers. Quite fittingly, Christine Stevens was chosen to present the James R.C. Leitzel Lecture at MathFest 2008. Her inspiring talk, "Building Mathematical Community,"



To increase awareness of women's ongoing contributions to the mathematical sciences, the AWM is (*pending funding*) sponsoring an essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers. The essays will be based primarily on an interview with a woman currently working in a mathematical career. This contest is open to students in the following categories: **grades 6–8**, **grades 9–12**, and **undergraduate**.

At least one winning entry will be chosen from each category. Winners will receive a prize, and their essays will be published online at the AWM Web site. Additionally, a grand prize winner will have his or her entry published in the AWM *Newsletter*. For more information, contact Dr. Victoria Howle (the contest organizer) at victoria.howle@ttu.edu or see the contest Web page: www.awm-math.org/biographies/contest.html. The deadline for receipt of entries is **February 27, 2009**. *(To volunteer as an interview subject, contact Howle at the e-mail address given.)*

which described the accomplishments of the program and its impact on the mathematical community, earned a standing ovation from an appreciative audience.

Claudia Neuhauser and Carla Savage treated MathFest crowds to wonderful invited addresses entitled, respectively, "Ecological and Evolutionary Consequences of Species Interactions" and "Generalizing '2': The Combinatorics of l-Sequences." Neuhauser is HHMI Professor and Head of the Department of Ecology, Evolution and Behavior at the University of Minnesota, Twin Cities and Director of the Center for Learning Innovation at the University of Minnesota, Rochester. Savage, who is Professor of Computer Science at North Carolina State University, is an expert on computer parallel algorithms, coding theory, and graph theory. She is currently Chair of the SIAM Activity Group on Discrete Mathematics. Laura Taalman of James Madison University presented the MAA Lecture for Students. Her research interests include singular algebraic geometry and knot theory, and her talk "Sudoku: Questions, Variations and Research" featured yet another of her interests, mathematical puzzles. Taalman has been a recipient of the Trevor Evans Award and the Alder Award from the MAA.

NSF-AWM Travel Grants for Women

The objective of the NSF-AWM Travel Grants program is to enable women researchers in mathematics or in mathematics education to attend research conferences in their fields, thereby providing a valuable opportunity to advance their research activities and their visibility in the research community. By having more women attend such meetings, we also increase the size of the pool from which speakers at subsequent meetings may be drawn and thus address the persistent problem of the absence of women speakers at some research conferences. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM.

Travel Grants. Two types of grants are available. The Mathematics Travel Grants provide full or partial support for travel and subsistence for a meeting or conference in the applicant's field of specialization. The Mathematics Education Research Travel Grants provide full or partial support for travel and subsistence in math/math education research, for mathematicians attending a math education research conference or math education researchers attending a math conference. In either case, a maximum of $1500 for domestic travel and of $2000 for foreign travel will be applied. For foreign travel, US air carriers must be used (exceptions only per federal grants regulations; prior AWM approval required).

Eligibility. These travel funds are provided by the Division of Mathematical Sciences (DMS) and the Division of Research, Evaluation and Communication (REC) of the NSF. The conference or the applicant's research must be in an area supported by DMS. Applicants must be women holding a doctorate (or equivalent experience) and with a work address in the USA (or home address, in the case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years is ineligible. Anyone receiving more than $2000 yearly in external governmental funding for travel is ineligible. Partial travel support from the applicant's institution or from a non-governmental agency does not, however, make the applicant ineligible.

Applications. All applications must be submitted online via the web-based system which is available through a hotlink at http://www.awm-math.org/travelgrants.html. The application requirements and a complete step-by-step process are available at the online site. If you have not already done so you must first create a user account—this will be the first screen when you access the site. During the application process you will be asked to attach one .pdf file that includes your proposal, CV and current and pending funding information, as applicable. If you have a speaker confirmation letter or e-mail notification, scan the document as an electronic file and attach it as a .pdf. In addition, please complete the application pre-survey administered by an independent evaluator. You may contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance. There are three award periods per year. The next two deadlines for receipt of applications are **February 1, 2009** and **April 1, 2009**.

MathFest 2008

Georgia Benkart and Rebecca Goldin

Jenny Quinn with her award from AWM

Julia Zuev at the Falconer luncheon

Rebecca Goldin

Having fun at the Falconer luncheon

The Use and Abuse of Statistics in the Media

Rebecca Goldin, George Mason University and STATS

About four years ago, I had the opportunity to become the Director of Research at a nonprofit organization called Statistical Assessment Service (STATS). At the time, STATS considered itself a watchdog organization whose goal was to limit the media's misportrayal of scientific issues and its influence on government and politics. I was stepping up as Director of Research just as STATS was joining George Mason University, where I am a professor of mathematics. Since then, STATS has taken on an educational component to its mission—to help journalists on the front end of writing about anything involving statistics—while maintaining its role in advocating for sound science in the press.

As most savvy news consumers are aware, numbers are everywhere in the press and the media more generally. But the percentages or figures that are cited are often only the beginning of a deeper story. The deeper story is hardly ever told—partly because journalists feel the public is uninterested, partly because journalists don't have enough time to pursue topics in-depth, and partly because statistics are extremely vulnerable to being manipulated by our interests.

Last year, big headlines pointed to a decline in health insurance coverage and a looming crisis for many Americans. People were angry and politicians were clamoring for action, on the basis of the increasingly large pool of people without insurance. The *Washington Post* noted that "Recent census figures show that a record 46.6 million Americans, including 8.3 million children, had no health insurance in 2005, up from 39.7 million in 1994." However, it turned out that, for children, the numbers of uninsured had gone down, from 9.8 million in 1995 (1994 figures were unreported) to 8.3 million, according to the Census Bureau. But even more misleading is looking at the *absolute numbers* rather than the *percentages,* since the population increased. According to the U.S. Census Bureau, 15.2 percent of the population was uninsured in 1994, compared to 15.9 percent in 2005 (a modest increase of 0.7 percent absolute increase, or 4.6 percent relative increase). Thus the *Post* managed to misrepresent the problem for kids and greatly exaggerate the problem for adults.

At times a study is conducted by dividing people by-inappropriate demographics that can obscure the picture. If we find that Mississippi has a higher infant death rate than Tennessee, the issue could be that state management of hospital care isn't as good in Mississippi as it is in Tennessee (suggested by a state-by-state comparison) or it could be that poorer people are having more trouble getting medical care (suggested by a economic approach). This could have implications for how resources are distributed.

Perhaps the most common misunderstanding comes when journalists—and their readers—confuse causation and correlation. This happens even more frequently when there's an underlying bias that makes that point of view convenient. Last year, we saw claims that caffeine causes miscarriage, that the internet causes antisocial behavior, and that using infant formula causes accidental deaths. All of these are possibilities, but the correlated observations are far from putting their fingers on the real problems. A little research brings all sorts of information out from the woodwork. Caffeine-drinking mothers-to-be are less likely to be nauseous from their pregnancies and are therefore more likely to have hormonal misbalances to begin with. Introverts are far more likely to find an outlet for their social lives on the internet than elsewhere, and nursing mothers are less likely to allow their children out of their arms.

Unfortunately, the press loves a big headline. And people are interested when their personal beliefs or fears are stoked. Perhaps for this reason, scary headlines abound. Headlines alone drive people into a state of anxiety even before reading the figures. Perhaps one of the most important features of discussions of risk is to put it in perspective. How does the risk of breast cancer due to hormone therapy compare to that of eating red meat, or to death due to a car accident? How does the quantity of carcinogens in our drinking water compare to the quantities of arsenic found in carrots, and how likely is it to cause cancer?

We can all appreciate the conflict of interest when newspapers do their own studies, such as the assorted rankings of educational institutions. *U.S. News and World Repor*t is perhaps the most influential, but the *Washington Monthly* and the *Washington Post* have also taken a stab at

selling newspapers by "evaluating" colleges, universities, and even high schools. The problem with these rankings is not so much that they are conducted by news reporting agencies, but that the results are often "packaged" in a way that is misleading. The *Washington Monthly,* for example, claims to have a ranking that weights equally "community service," "research," and "mobility." However, the proxies used to measure these traits easily distorted the results. "Community service," for example, is a score based on the percentage of those who serve in ROTC (which has high variability among schools, and hence counts a lot compared to other schools), the percentage of alumni who participate in the Peace Corps (which has low variability and hence counts little) and the percentage of its federally funded work-study grant money spent on community service projects; community service such as serving the homeless in a shelter or becoming a public school teacher does not count. It is not a surprise that Texas A&M, which has a huge ROTC program, came out far ahead of a school like Harvard, which has no ROTC program of its own (students may participate through MIT). Similarly, the "research" score was based on dollars spent on research, without taking into account the size of the school—perhaps this is why CalTech dropped to 109th on the *Monthly* rankings. Similarly, the *Washington Post* ranks high schools by the ratio of students *taking* Advanced Placement, International Baccalaureate and/or Cambridge exams (results are unimportant) to the graduating class size. While access to high level courses with an aim toward these tests is perhaps a goal to strive for, it's hardly the most immediate—or only—measurement that comes to mind in assessing the best high schools of the country. But the package—ranking the "best"—seems to sell papers, and as a consequence, people buy into it.

One of the biggest pleasures of working with STATS is to knock down poor arguments about issues that affect a lot of people's lives. When the then-president of Harvard Larry Summers spoke to a large group of scholars interested in the question of why there are so few tenured female faculty in the hard sciences, he replied that (among other reasons) standardized tests suggested that far from the mean, men outnumber women significantly. In his opinion, differences in "intrinsic aptitude, and particularly of the variability of aptitude" played an important role. In light of current news announcements that the gender gap has been closed in standardized exams across several states, Summer was not claiming that there was a difference in average "intrinsic aptitude." Summers was arguing that the standard deviation was much higher for boys than for girls; if there were an "intelligence curve," so the argument goes, there would be a bell curve for boys, and one for girls, but the curve for girls would be narrower than the one for boys—and boys would populate both extremes of intelligence, several deviations out from the mean.

Both Summers and many media pundits missed that SAT scores (or other test scores) are generally a poor proxy for mathematical ability and intelligence at the highest level. As with all tests, the SAT measures exactly what it tests: the ability to quickly solve specific problems correctly on a high-pressure, timed exam. Invariably, there are students who are poor test-takers but good "thinkers"; but more to the point, while the resulting scores may indicate "achievement" or "mastery" of a certain skill set, they cannot distinguish those who are truly brilliant from those who are just "very good" at the skill set.

There are also many skills that lead to scientific success but are not measured on these tests at all—perseverance, patience, time commitment, interest, ability to work with others, management and communication skills, the ability to bridge diverse ideas, and so forth. When scientists are asked to list the "very best" scientists in their field, reputation derives not from the ability to perform basic computations quickly, but rather from the ability to generate deep ideas that have a profound impact on science. This simply cannot be measured with test scores. This is not to dismiss SAT scores as a measure of something, but using them as a surrogate for the brilliance, talent and luck that lands one a tenured position at Harvard is a huge stretch.

Finally, we come to causation and correlation yet again. Why did Summers' hypothesis that the observed differences on test scores measure something "innate" take hold for so many people? There is a lot of evidence to suggest otherwise. One of the most persuasive arguments is that the gap between the genders is diminishing; girls now score higher on these tests than they did twenty years ago, and even twenty years ago they did better than they had done fifty years ago. If the tests were measuring innate talent, we would

not see significant differences from one generation to the next. Even if there weren't problems with using test scores as a proxy for talent at the highest levels in science, the evidence that the measured differences are innate is, from an academic point of view, woefully weak. Summers and others confused the *correlated* observations (being female is correlated with worse test performance several standard deviations from the mean) with *causality* (being female causes lower test scores far from the mean).

I felt proud to be one of many academics who spoke out, in my case through STATS and an op-ed in the *Washington Post* written with my father Gerald Goldin and my sister Andrea Foulkes. We argued against the validity of the "innate aptitude" argument, while noting that it is attached to a painful history (at Harvard and more generally) in which women are thought less likely to succeed at the highest levels of science. This history is sad not only for the women or for society, but it has clearly stymied the growth of science itself by not always encouraging the best people to spend their lives discovering it. By encouraging the public to be number savvy, we reduce our vulnerability to our own biases and fears.

Awards and Honors

Janet L. Norwood Award

Richard F. Sarver, Program Manager II

Dr. Xihong Lin, Professor of Biostatistics at Harvard's School of Public Health, is the recipient of the Seventh Annual Janet L. Norwood Award for Outstanding Achievement by a Woman in the Statistical Sciences. She accepted the award at the University of Alabama at Birmingham on September 17, 2008.

Dr. Lin received her B.S. in Applied Mathematics from Tsinghua University, M.S. in Statistics from the University of Iowa and Ph.D. in Biostatistics from the University of Washington. She began her academic career at the University of Michigan in 1995, progressing steadily through the ranks to that of Professor of Biostatistics, a position which she currently holds at Harvard's School of Public Health. Her research areas include statistical learning methods for high-dimensional data, dimension reduction, variable selection, nonparametric and semiparametric regression models, measurement error, mixed (frailty) models, estimating equations, and missing data. She is a Fellow of the American Statistical Association and the Institute of Mathematical Statistics and an elected member of the International Statistical Institute. She is recipient of the COPSS President's Award from the Committee of Presidents of Statistical Societies as well as a National Cancer Institute MERIT Award recipient. Dr. Lin has been a member of the editorial boards of *Biometrika, Biometrics, Statistica Sinica,* and the *Journal of the American Statistical Association*.

China Girls Math Olympiad

Mathematical Association of America

The 2008 China Girls Mathematical Olympiad (CGMO) has wrapped up, and both of the MAA-sponsored U.S. teams are bringing home plenty of extra luggage. All eight girls who participated for the U.S. earned a medal. Lynelle Ye and Jennie Iglesias earned gold medals; Wendy Mu, silver; and In Young, Carolyn Kim, Colleen Lee, Joy Zheng, and Jenny Jin, bronze. For comments from the eight CGMO participants, visit http://www.msri.org/specials/gmo/2008.

To get ready for the contest in China, which has been held annually since 2002, the young women spent three weeks at the Mathematical Olympiad Summer Program at the University of Nebraska, Lincoln, which helped them develop their problem-solving skills. Coaches for the team were Zuming Feng of Phillips Exeter Academy and director of the Mathematical Olympiad Summer Program since 2003; Alison Miller, a member of the 2004 U.S. IMO team; and MIT student Maria Monks.

Other sponsors of the U.S. teams are Intel, Akamai Foundation, Mathematical Sciences Research Institute, Shiing-Shen Chern Foundation for Mathematical Research, and Sunlin and Priscilla Chou Foundation.

AAAS Mathematical Modeling Symposia

Edward Aboufadel, Secretary of Section A of the AAAS,
aboufade@gvsu.edu

The 2009 Annual Meeting of the American Association for the Advancement of Science will be February 12–16, in Chicago, IL. The theme of this year's meeting is "Our Planet and Its Life: Origins and Futures," which is a nod to the fact that 2009 is the 200th anniversary of the birth of Charles Darwin and the 150th anniversary of the publication of *On the Origin of Species by Means of Natural Selection.* Many of the symposia sponsored by Section A (Mathematics) are interdisciplinary sessions that fit this theme.

The Annual Meeting is organized into symposia which have three or more speakers, and often a discussant who reflects on the talks that are given. Section A is sponsoring six symposia this year, featuring outstanding expository talks by prominent mathematicians. The six symposia sponsored by Section A this year are:

- The Mathematical Twists and Turns of Data Sets (organized by Robert Ghrist, University of Illinois, Urbana-Champaign)
- Games People Play: Challenges of Applying Mathematics and Computers to Games (organized by Bob Hearn, Dartmouth College)
- Climate and Disease: Quantitative Insights and Interdisciplinary Challenges (organized by Mercedes Pasqual, University of Michigan)
- Green, Gene, Growing Machines: The Evolutionary Shaping of Plant Form (organized by David Baum, University of Wisconsin)
- Mathematical Biology, the New Frontier: Educating the Next Generation (organized by Bonnie Shulman, Bates College)
- Mathematics of Origami: From the Joys of Recreation to the Frontiers of Research (organized by Edward Aboufadel, Grand Valley State and Patsy Wang-Iverson, The Gabriella and Paul Rosenbaum Foundation)

Other symposia that will be of interest to the mathematical community include:

- New Computing Platforms for Data-Intensive Science
- A New Kind of Scientist: Professional Master's Education and U.S. Competitiveness
- Artificial Cells: Models of the Simplest Life
- The Grid, the Cloud, Sensor Nets, and the Future of Computing
- Big, Small, and Everything in Between: Simulating Our World Using Scientific Computing
- Providing Science Advice to the U.S. Congress: Is a New Paradigm Needed?
- The Evolution of Knowledge Production: Exploring Creativity, Innovation, and Networks
- Earth's History and Future Revealed at the Frontier of Scientific Computing
- K–12 Engineering Education in the United States
- Inquiry or Direct? Research-Based Practices in Science Education
- Interdisciplinary Approaches to the Study of Large-Scale Human Networks
- The Science of Kissing

The above symposia are only a few of the nearly 200 AAAS program offerings in the physical, life, social, and biological sciences. For further information, including the schedule of talks, go to www.aaas.org/meetings.

AAAS annual meetings are the showcases of American science, and they encourage participatioin by mathematicians and mathematics educators. Section A acknowledges the generous contributions of AMS and MAA for travel support and SIAM for support of media awareness.

The 2010 meeting will be February 18–22, 2010 in San Diego. The Steering Committee for Section A seeks organizers and speakers who can present substantial new material in an accessible manner to a large scientific audience. All are invited to attend the Section A Committee business meeting in Chicago on Friday, February 13, 2009, at 7:45 p.m., where we will brainstorm ideas for symposia. In addition, I invite you to send me, and encourage your colleagues to send me, proposals for future AAAS annual meetings.

Fan Chung Graham Named 2009 Noether Lecturer

AWM, September 2008

The Association for Women in Mathematics is pleased to announce that Fan Chung Graham will deliver the Noether Lecture at the 2009 Joint Mathematics Meetings. Chung, a professor of mathematics at University of California at San Diego, was selected for this honor because of her fundamental contributions to graph theory and combinatorics.

Born in Taiwan, Chung received her B.S. in Mathematics from the National Taiwan University and her Ph.D. from the University of Pennsylvania. She began her career at Bell Laboratories, eventually becoming Division Manager of Mathematics, Information Systems and Operations Research at Bellcore. She has held visiting positions at Princeton, Harvard and the Institute for Advanced Studies. In 1995, Chung accepted a professorship at the University of Pennsylvania. Since 1998, she has been Professor of Mathematics and of Computer Science and Engineering at the University of California, San Diego, where she is also the Akamai Professor in Internet Mathematics.

A prolific mathematician, Chung has authored several books and over 240 papers and has about 120 coauthors. She is a member of the editorial board of more than a dozen journals and serves as Editor-in-Chief of *Internet Mathematics.* Chung has served on the Council of both the American Mathematical Society and the Society for Industrial and Applied Mathematics. She received the Allendoerfer Award from the Mathematics Association of America in 1990 and became a fellow of the American Academy of Arts and Sciences in 1998. She has given an invited address at the International Congress of Mathematicians and an AMS-MAA invited address at the Joint Mathematics Meetings.

Fan Chung Graham

Chungs's research interests are in graph theory, combinatorics and algorithmic design. She is particularly well-known for her work in spectral graph theory, random graphs, quasi-randomness and unavoidable and universal graphs. Her current focus is on the mathematical analysis of PageRank™ using both probabilistic and spectral methods with an emphasis on graph partitioning.

Cathy Kessel, president of AWM, was very enthusiastic about Chung, saying "Take a look at her Web site and her biography on the MacTutor History of Mathematics site! I am definitely looking forward to her talk."

The 2009 Joint Mathematics Meetings will be held January 5–8 in Washington, D.C. The lecture honors Emmy Noether (1882–1935), one of the great mathematicians of her time. She worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration. Recent Noether lecturers include Ingrid Daubechies, Lai-Sang Young, Svetlana Katok, Jean Taylor, Lenore Blum, and Karen Vogtmann.

Correction

Suzanne Lenhart (University of Tennessee) was inadvertently omitted from the list of organizers for the AWM-SIAM 2008 workshop in the September-October issue of the AWM *Newsletter.* Suzanne recruited and coordinated the mentors, which is always a crucial task. We apologize for this error, and we take this opportunity to thank her for this and the many other ways in which she has served AWM.

Las Chicas de Matematicas: UNC Math Camp for Young Women

Hortensia Soto-Johnson & Cathleen Craviotto, University of Northern Colorado

Introduction

This summer the University of Northern Colorado (UNC) School of Mathematical Sciences was pleased to host its first math camp for young women. Hortensia Soto-Johnson and Cathleen Craviotto served as project directors for *Las Chicas de Matematicas: UNC Math Camp for Young Women.* The camp was a one-week residential camp for 30 incoming 9th–12th grade girls and was held during the week of June 15–20. This program was funded by the UNC Office of Enrollment Management and the Mathematical Association of America Tensor Foundation. Hortensia, Cathleen, and Ricardo Diaz served as faculty for the camp, and four UNC female mathematics majors (Chrissy Berens, Veronica Garcia, Melissa Martinez, and Justine Sandersfeld) participated as camp counselors. The counselors stayed in the dorms with the participants, provided help in the classroom, assisted with study sessions, and provided general supervision of the participants.

The goals of the camp were to introduce the participants to college-level mathematics though problem-solving and collaborative learning, to allow the participants to experience college, and to provide opportunities for our participants to interact with women who have careers in math-related fields. We were pleased to recruit 30 young women from throughout Colorado and one from western Nebraska. Based on surnames and discussions with the young women we found 18 participants were Hispanic, 10 participants were Anglo, one young woman was Taiwanese, and another participant was Indian.

The Camp

We kicked off the camp with a picnic for the participants, their parents, and their high school teachers. This was an opportunity to provide everyone with an overview of the program and to inform the participants and their parents of student expectations. Each day the camp began with a hearty breakfast and an activity facilitated by directors or our cultural centers. This was followed by 2.5 hours of mathematical modeling taught by Ricardo Diaz, a 1-hour presentation by

Call for Nominations: 2010 Louise Hay Award

The Executive Commitee of the Assocation for Women in Mathematics has established the Louise Hay Award for Contributions to Mathematics Education, to be awarded annually to a woman at the Joint Prize Session at the Joint Mathematics Meetings in January. The purpose of this award is to recognize outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

The nomination documents should inclue: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. *Five* complete copies of nomination materials for this award should be sent to: The Hay Award Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. Nominations must be received by **April 30, 2009** and will be kept active for three years. For more information, phone 703-934-0163, e-mail awm@awm-math.org or visit www.awm-math.org. Nominations via e-mail or fax will not be accepted.

Sylvia Medina, Savannah Grasmick, Cyndi Hartman (Wolf Robotics), and Anna Caudillo conduct an experiment.

Study session

a female guest speaker who shared the importance of mathematics in her career, lunch with the guest-speaker, 2.5 hours of number theory co-taught by Hortensia and Cathleen, study time, dinner, social activity, study time and then time for bed. Our schedule dedicated 8.5 hours a day to mathematics.

Breakfast activities included a personal image and team-building activity, a machete dance presentation delivered by Lambda Theta Nu, pilates, crafts from other cultures, and crumping (a type of dance). Our guest speakers included a civil engineer, a software/electrical engineer, a mathematician/statistician, a research physician, and a chemist. These women emphasized the importance of mathematics in their careers and stressed how mathematics allowed them to pursue several paths in their careers. Ruth Rollins, a civil engineer, stated, "mathematics opened doors me." Our guest speakers also spoke to the importance of balancing career and family and the importance of a support system. Each speaker let our participants know women do not need to choose between career and family—it is possible to have both. The evening social activities gave our participants an opportunity to interact with one another outside of the classroom and helped balance the intense work time. Our social activities included spending time in the gym (wall climbing was a blast), learning to zumba dance, watching a movie while swimming, and attending the *Hairspray* musical. Our camp culminated with a banquet for the participants, their parents, and their high school teachers. During the banquet, our participants presented the mathematics that they learned during the week. We also showed a slideshow for parents and teachers to witness the friendships that were created during the week and the commitment that their daughters dedicated to our program.

Each participant was assigned a roommate who was not from the same school. We also assigned each participant to a math modeling working group and a number theory working group—roommates were in the same group. We ensured no group contained participants from the same school. This gave our participants an opportunity to get to know several of the other young women. It also allowed our participants to work with young women with diverse cultural and mathematical backgrounds.

The Impact

Activities such as *Las Chicas de Matematicas: UNC Math Camp for Young Women* can serve as a recruitment tool. We believe it encouraged young women to pursue more mathematics and to consider attending UNC. Most importantly, we exposed first generation students and their parents to the importance of obtaining a college degree. It is

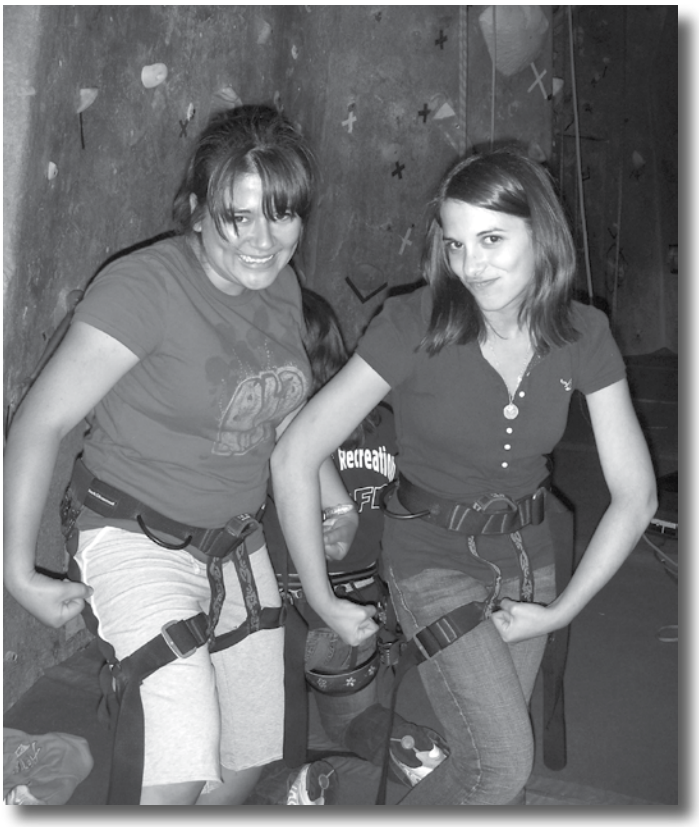
difficult to measure the impact that the camp had on our participants, but we can express what this experience meant to our participants in their own words.

In a final survey, we asked the participants to share what they would take home from the camp. Besides new friendships, their comments fell into three categories: confidence, career choice and college of choice. Below are some of our students' comments.

Confidence

Sarah: *I've been more confident and I am even more interested in math than I ever was. I just loved this week! It was amazing. Coming into this camp I was doubtful—but now I can't wait to come back next summer.*

Emilia: *From this camp, I will take home confidence. Confidence in my mathematical skills and confidence in who I am as a person. It helped me feel more confident about math and it helped me bond with complete strangers.*



Paulina Payan and Carissa Parinello are mathematically and physically strong.

Las Chicas de Matematicas: UNC Math Camp for Young Women 2008

Career Options

Katie: *I will take home everything I learned; the math the college experience, new friends, knowledge, everything!! This camp really opened my eyes! I honestly never really considered too many jobs that have to do with math, but now I really want to look into things like that.*

Sylvia: *This was an awesome opportunity. You all have impacted my thoughts and decisions for my future. I would love to attend camp again next summer.*

College of Choice

Andrea: *From this camp I am taking home a better knowledge and appreciation for math. I also am now considering UNC as a possible future school. UNC has a great campus and awesome math professors.*

The Future

In an effort to maintain this confidence and awareness, we will facilitate two follow-up activities with our participants. One will take place in the fall and the other in the spring. We have obtained funding for the 2009 *Las Chicas de Matematicas: UNC Math Camp for Young Women* and we are eager to see familiar and new participants.

Book Review

Book Review Editor: Margaret Bayer, University of Kansas, Lawrence, KS 66045-7523, bayer@math.ku.edu

Kim Tolley, **The Science Education of American Girls. A Historical Perspective**. RoutledgeFalmer, New York, 2003. ISBN 0-415-93472-9

Reviewer: Marge Bayer

Review, Part II

During the Civil War and on into the twentieth century, women were increasingly employed as teachers. The highest proportion of women teachers came in 1921–1922, when women made up 87% of elementary and 64% of secondary teachers [p.141]. Schools often chose to hire women teachers because they were paid as little as half the salary of male teachers.

The large demand for women teachers had a major effect on the high school curriculum for girls. High schools needed to train girls in subjects that they would later teach themselves, even subjects previously considered the domain of boys. In schools where teachers specialized, there was certainly gender differentiation by subject matter. Records from school inspections in Wisconsin public high schools from 1915 to 1928 show that females made up 93.5% of English teachers, 50.5% of algebra teachers, 44% of geometry teachers, and 4.5% of physics teachers [p. 90].

In the early twentieth century women made gains in leadership positions in education as school principals and district superintendents. This, along with the women's suffrage movement, contributed to moves to increase women teachers' salaries relative to men's. At the same time, however, some segments of society tried to reverse the trend towards women dominating the teaching field. At the turn of the century, girls outnumbered boys at public high schools, girls stayed in school longer, and girls excelled in higher numbers. Some educators blamed this on the feminization of the schools by women teachers. In fact, the causes were primarily economic. Boys left school for work, generally in jobs not open to women and paying wages higher than those in teaching or other women's professions. For girls education paid off: school teaching and nursing paid better than domestic service or factory work, jobs open to girls who hadn't finished high school. Both nursing and school teaching required a background in science.

In Part I, I discussed the central place that natural history occupied in science education, especially for girls. At the beginning of the 1800s, it was not considered appropriate for women to collect specimens or do other field work, except in the tamest of environments. However, that changed over the century, and, as mentioned in Part I, women, even as amateurs, made significant contributions to natural history through field work. The rhetoric changed to legitimize this, with women described as particularly suited as nurturing conservationists and as benefiting from outdoor exercise. As the demand for women teachers increased, it even became accepted that women would do dissections and other dirty work in the lab.

With Darwin, there was a shift in natural history away from studying individual specimens in isolation to studying organisms within their environment. By the turn of the century, this kind of participatory and environmental approach to science was formalized by the "nature-study movement." As public elementary education took hold, the question of a science curriculum was discussed. A loose coalition of scientists, educators and others advocated a "hands-on" approach to the study of the natural world in elementary schools. The focus was on field work, observation and experimentation. By 1918 every state required attendance at elementary school, so the students exposed to the nature-study curriculum came from all classes and races. The creation of curricular materials was decentralized, with many women involved. These materials regularly depicted girls as well as boys engaged in nature-study activities. Botany, in particular, was of interest to many women and was seen as a particularly appropriate subject for girls. The physical sciences, on the other hand, were sometimes omitted from the elementary curriculum. At the high school level physical science came to be thought of as boys' science. (Recall the tiny numbers of female physics teachers cited above.)

At the high school level, the turn of the century brought a move to standardize science education across the

country. In the 1890s the National Education Association appointed the Committee of Ten to ease the transition from high school to college by making college entrance requirements more uniform. One result of the Committee's recommendations was the decline of astronomy, geology and meteorology in the high schools. Only one year of science was required for entrance to most universities and colleges. High schools began the now-familiar schedule of course offerings: biology in 10th grade, chemistry in 11th and physics in 12th. In theory this was gender-neutral. Gone were textbooks and curricula specified for one gender. However, enrollments in electives were another thing. Most girls stopped taking science after 10th grade; the percentage of girls taking chemistry and physics declined steadily from 1890 to 1928 and stayed at the lower levels for decades [p. 170].

The early twentieth century brought the introduction of vocational training at the high school level. It should be noted that in the nineteenth century, science curricula in schools contained little in the way of applications. (There were some vocational evening courses which treated applied science.) By 1900, in part in response to the tendency of boys to drop out of school to go to work, schools began to develop vocational courses. The vocational courses were strongly differentiated by gender. They prepared girls for "commercial" (secretarial) work and for homemaking and domestic service.

Some strong supporters of women's participation in science thought that the development of scientific "home economics" would help science reach broad classes of women and give greater status to women's work. University-

Sonia Kovalevsky High School Mathematics Days

Through grants from Elizabeth City State University and the National Security Agency (NSA), the Association for Women in Mathematics expects to support Sonia Kovalevsky High School Mathematics Days at colleges and universities throughout the country. Sonia Kovalevsky Days have been organized by AWM and institutions around the country since 1985, when AWM sponsored a symposium on Sonia Kovalevsky. They consist of a program of workshops, talks, and problem-solving competitions for high school women students and their teachers, both women and men. The purposes are to encourage young women to continue their study of mathematics, to assist them with the sometimes difficult transition between high school and college mathematics, to assist the teachers of women mathematics students, and to encourage colleges and universities to develop more extensive cooperation with high schools in their area.

An additional selection cycle will be held in February 2009 for Spring 2009 using funds remaining after the August 2008 selection cycle. AWM anticipates awarding up to six additional grants ranging on average from $1500 to $2200 each ($3000 maximum per school) to universities and colleges. Historically Black colleges and universities are particularly encouraged to apply. Programs targeted toward inner city or rural high schools are especially welcome.

Applications, not to exceed six pages, should include: a) a cover letter including the proposed date of the SK Day, expected number of attendees (with ethnic background, if known), grade level the program is aimed toward (e.g., 9th and 10th grade only), total amount requested, and organizer(s) contact information, b) plans for activities, including specific speakers to the extent known; c) qualifications of the person(s) to be in charge; d) plans for recruitment, including the securing of diversity among participants; e) detailed itemized budget (i.e., food, room rental, advertising, copying, supplies, student giveaways, etc. Honoraria for speakers should be reasonable and should not, in total, exceed 20% of the overall budget. Stipends and personnel costs are not permitted for organizers. This grant does not permit reimbursement for indirect costs or fringe benefits. Please itemize direct costs in budget.); f) local resources in support of the project, if any; and g) tentative follow-up and evaluation plans.

The decision on funding will be made in late February for high school days to be held in Spring 2009. If selected, a report of the event along with receipts (originals or copies) for reimbursement must be submitted to AWM within 30 days of the event date or by June 1, 2009, whichever comes first. Reimbursements will be made in one disbursement; no funds will be disbursed prior to the event date.

Send *five* complete copies of the application materials to: Sonia Kovalevsky Days Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. For further information: phone 703-934-0163, e-mail awm@awm-math.org, or visit www.awm-math.org. Applications must be received by **February 4, 2009**; applications via e-mail or fax will not be accepted.

based research in home economics had a strong scientific basis. The development of the field benefited some women by giving them opportunities as university professors and researchers. But by the time home economics filtered down to schools, the scientific content was generally lost. Vocational education in home economics simply trained girls, particularly working class and African-American girls, to do households tasks as homemakers or servants.

Furthermore, vocational education, for both boys and girls, had to come at the cost of something in the traditional curriculum. Since, following the Committee of Ten's recommendation, schools generally required only one year of science, science courses were almost always the courses replaced by vocational education courses. The introduction of the new courses in the schools was often accompanied by hiring "vocational guidance professionals." These counselors, almost uniformly, presented girls with very limited choices for their post-school paths. This happened at the same time that there was in some circles a backlash against women teachers.

Before World War II, vocational education was an alternative route for a minority of students. After the war, a movement, later dubbed "life adjustment education," proposed much broader goals for education, suggesting that schools should prepare students from all classes for all aspects of adult life. Proponents of life adjustment sought to make schooling more practical and useful, and to this end, they evaluated school subjects on the basis of their social or vocational utility [p. 199]. Alternatives, such as business writing or business math, were offered, and enrollment in traditional academic subjects declined. This vision of education and related cultural mores of the time influenced

NSF-AWM Mentoring Travel Grants for Women

The objective of the NSF-AWM Mentoring Travel Grants is to help junior women to develop a long-term working and mentoring relationship with a senior mathematician. This relationship should help the junior mathematician to establish her research program and eventually receive tenure. AWM expects to award up to seven grants, in amounts up to $5000 each. Each grant will fund travel, accommodations, and other required expenses for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month. Awardees may request to use any unexpended funds for further travel to work with the same individual during the following year. In such cases, a formal request must be submitted by the following February 1st to the selection committee, or the funds will be released for reallocation. (Applicants for mentoring travel grants may in exceptional cases receive two such grants throughout their careers, possibly in successive years; the second such grant would require a new proposal and would go through the usual competition.) For foreign travel, US air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

Eligibility. Applicants must be women holding a doctorate or equivalent experience and with a work address in the US (or home address if unemployed). The applicant's research may be in any field that is supported by the Division of Mathematical Sciences of the National Science Foundation. (See http://www.nsf.gov/od/lpa/news/publicat/nsf03009/mps/dms.htm#1 for the list of supported areas.)

Applications. All applications must be submitted online via the web-based system which is available through a hotlink at http://www.awm-math.org/travelgrants.html. The application requirements and a complete step-by-step process are available at the online site. If you have not already done so you must first create a user account—this will be the first screen when you access the site. During the application process you will be asked to attach one .pdf file that includes your research proposal (approximately five pages in length, specifying why the proposed travel would be particularly beneficial), CV, proposed budget and information on current and pending funding, if applicable. In a second step you will be asked to attach one pdf file that includes the proposed mentor's letter of support (indicating his/her availability at the proposed travel time) and CV. You may contact Jennifer Lewis at 703-934-0163, ext. 213 for guidance. A final report will be required from each awardee. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. The deadline for receipt of applications is **February 1, 2009**.

standard academic courses as well. The 9th grade science curriculum saw a trend towards applications as opposed to scientific principles. Textbooks reinforced the idea that girls could not, and would have no reason to, participate in science. A great strength of Tolley's book is that we see that view of girls and science as a result of one hundred years of shifting values and perceptions in education and society in general, and not as a "natural order."

And then there was Sputnik. Policymakers and educational leaders recognized the need for a renewed emphasis on mathematics and science. But the changes were neither broad nor deep. Textbooks, particularly for the most talented students, were revised. However, graduation requirements were not modified to include more science. The three year high school science sequence was unchanged, resulting in very small enrollments in physics courses. At best, the country identified particularly talented white boys and gave them greater training in science. Girls were left out of the plan. For all but the chosen few, there was little change in science education in the high schools.

In 1957 Margaret Mead studied attitudes of high school students towards scientists. She concluded:

> They choose against science unless they have the specific type of mind believed to be "good at" it and the kind of single-minded devotion to the smell of a laboratory that leads them to prefer working here, not only to going to the ball field or the corner drugstore but also to working in a library or studio. [p. 206]

This attitude worked (and works) against the participation in science of all children and combined with gender stereotyping to be particularly discouraging for girls. According to Tolley's research, this was not an attitude prevalent a century earlier. We struggle now to recover from the history of science education and gender differentiation of the last century.

Tolley's careful research avoids the pitfall of relying on the contemporary rhetoric over and above the facts. This gives us a rich view of the complexities of science education over the life of our country. One frustration I had was that she did not indicate the total levels of participation in education of girls and boys in the various time periods. Comparisons of percentages of female/male students study-ing science would be more meaningful if we knew the percentage of the female/male population actually in school and the economic profile of these students. It would be fascinating if we could see similar histories of science education for girls (and boys) in other countries.

Education Column

Jackie Dewar, Professor of Mathematics and Director of the Center for Teaching Excellence, Loyola Marymount University, Los Angeles, CA

Student Ratings of Teaching: An Oft-Overlooked Aspect Worth Your Attention

The question of gender effects on Student Ratings of Teaching (SRT) has arisen in this newsletter before. Indeed, despite a substantial amount of literature claiming that there is no consistent and significant evidence of gender, age, or ethnicity affecting ratings, women faculty in male-dominated disciplines often feel something to the contrary is reflected in their ratings. But bias may be difficult to detect in large scale studies when female faculty represent but a small percentage of faculty in the study, because instances of variances can be overwhelmed by large samples. However, the purpose of this article is not to judge the merits of the arguments for and against gender effects in SRT. Rather this article examines an often-overlooked but critical aspect of student ratings, namely how the resulting SRT data should be interpreted.

Because teaching is a complex human endeavor, no single measure can accurately evaluate it. Yet Student Ratings of Teaching are the most commonly used measure and often the only measure for evaluating teaching in higher education. Best practice calls institutions to encourage the use of multiple measures (Knapper and Cranton, 2001). Practicality prompts them to employ a single SRT form across multiple disciplines and pedagogies. Ideally, an SRT form would be aligned with the institution's own particular mission and situation and allow for tailoring to particular disciplines or types of pedagogies. No matter what form is adopted, it is essential to ensure that individuals making personnel decisions (retention, merit, tenure, promotion)

clearly understand what conclusions can be validly drawn from SRT data and under what conditions it is appropriate to do so. Unfortunately, many faculty members, department chairs and deans are unaware of some of the limitations of SRT data. The following guidelines are offered to readers of this column who are encouraged to share them with others at their home institutions.

Guidelines for Interpreting Student Teaching Evaluations

Student teaching evaluations are the most commonly used measure for evaluating teaching in higher education. There are at least two purposes for evaluating teaching: to improve the teaching and to make personnel decisions (merit, retention, promotion). When using student teaching evaluations for either of these purposes, it is essential to follow certain guidelines to ensure valid interpretation of the data. The following guidelines are adapted from Theall and Franklin (1991) and Pallett (2006).

#1. Sufficient Response Ratio

There must be an appropriately high response ratio.[1] For classes with 5 to 20 students enrolled, 80% is recommended for validity; for classes with between 21 and 50 students, 75% is recommended. For still larger classes, 50% is acceptable. Data should not be considered in personnel decisions if the response rate falls below these levels.

#2. Appropriate Comparisons

Because students tend to give higher ratings to courses in their majors or electives than they do to courses required for graduation, the most appropriate comparisons are made between courses of a similar nature. For example, the average of ratings across an entire college of arts and sciences would not be a valid comparison for a lower division quantitative literacy course.

[1] The following describes how to compute the response ratio for a given set of forms from one section of one course. First, note the number (n) of forms returned and the number (N) of students in the class, compute the ratio n/N, and then convert the ratio to a percent. Then, for each question under consideration, from this percent subtract the percent of blank and "Not Applicable" responses. The result is the response ratio for that particular question. If the result does not meet the threshold recommended in Guideline #1 above, the data from that question should not be considered.

#3. When Good Teaching is the Average

When interpreting an instructor's rating, it is more appropriate to look at the actual value of the rating instead of comparing it to the average rating. In other words, a good rating is still good, even when it falls below the average.

#4. Written Comments

Narrative comments are often given great consideration by administrators, but this practice is problematic. Only about 10% of students write comments (unless there is an extreme situation), and the first guideline recommends a minimum 50% response threshold. Thus decisions should not rest on a 10% sample just because the comments were written rather than given in numerical form! Student comments can be valuable for the insights they provide into classroom practice and they can guide further investigation or be used along with other data, but they should not be used alone to make decisions.

#5. Other Considerations

- Class size can affect ratings. Students tend to rank instructors teaching small classes (less than 10 or 15) most highly, followed by those with 16 to 35 and then those with over 100 students. Thus the least favorably rated are classes with 35 to 100 students.

- There are disciplinary differences in ratings. Humanities courses tend to be rated more highly than those in the physical sciences.

#6. One Final Point

Teaching is a complex and multi-faceted task. Therefore the evaluation of teaching requires the use of multiple measures. In addition to teaching evaluations, the use of at least one other measure, such as peer observation, peer review of teaching materials (syllabus, exams, assignments, etc.), course portfolios, student interviews (group or individual), outcomes assessment data, or alumni surveys is recommended.

References

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Theall, M. and Franklin, J. (eds.). *Effective practices for improving teaching.* New Directions in Teaching and Learning, no. 48, San Francisco: Jossey-Bass, 1991.

Budapest Semesters in Mathematics Program

Hungary has a long tradition of excellence in mathematics education. However, because of the language barrier, students have not been able to take advantage of the skill and dedication of the mathematics faculties of Hungarian universities.

Initiated by Paul Erdos, Laszlo Lovasz, and Vera T. Sos, the program Budapest Semesters in Mathematics provides a unique opportunity for North American undergraduates. Through this program, mathematics and computer science majors in their junior/senior years may spend one or two semesters in Budapest and study under the tutelage of eminent Hungarian scholar-teachers. The instructors of Budapest Semesters in Mathematics are members of Eotvos University and the Mathematical Institute of the Hungarian Academy of Sciences, the two institutions known for having educated more than half of Hungary's highly acclaimed mathematicians. Most instructors have had teaching experience in North America and are familiar with the cultural differences.

All courses are taught in English. Classes are small. Credits are transferable to North American colleges and universities. Semesters start in the first week of September and February. An optional intensive language course is offered about two weeks before regular classes begin. Information, including pictures and an electronic application form, is available online at www.stolaf.edu/depts/math/budapest. The program can accommodate about 60 students per semester. The application deadlines for fall 2009 and spring 2010 are April 30, 2009 and November 1, 2009 respectively; early applications are encouraged.

Professional Development for Women in Higher Education Administration

Magnhild Lien, Assistant Director, Teachers for a New Era/Professor of Mathematics, California State University Northridge

It is Saturday, June 21, 2008, and I have just checked into my dorm room at Bryn Mawr College in Pennsylvania. After unpacking my belongings, mostly clothes but also a few essentials for dorm living, I am heading down to the lounge to meet other dorm dwellers. Are you a student you may ask? No, I am there to attend a three and a half week summer institute for women in higher education administration.

Sixty-four women gathered at Bryn Mawr on that Saturday afternoon, all a little uncertain about what to expect. First of all, living in a dorm was for many a step back in time, and secondly the day by day schedule we found in our mailboxes was a bit daunting to say the least. However, as the program evolved, any anxieties we may have had quickly evaporated and it turned out to be a great learning experience as networks of women leaders from a variety of universities and colleges were formed.

Higher Education Resource Services (HERS) has been involved with advancing women leaders in higher education since the early seventies. The HERS Bryn Mawr Summer Institute is in its 33rd year. It is a professional development program for women leaders that benefits both the sponsoring institutions and the women themselves. Each participant leaves the Institute with a clear sense of self and what she can accomplish. This year's cohort was a diverse group of women both ethnically and professionally. The group represented fifty-nine colleges, community colleges and universities from twenty-six states, as well as Canada and the Marshall Islands. The participants included a number of vice presidents, vice provosts, associate vice chancellors, as well as deans, directors and chairs of academic and administrative departments. The broad range of experiences across disciplines, sectors and positions offered a unique environment to evaluate critical issues confronting higher education today. Only five of the sixty-four participants were from

STEM fields. While we see more and more women as chairs of STEM departments, it is still relatively rare for women senior administrators to come from those fields. Thus, to get women from STEM fields into higher education administration, professional associations as well as higher education institutions need to support, in academic leadership roles, women mathematicians and other female STEM faculty who have administrative skills and ambitions. Attending a HERS institute is a good foundation for expanding one's horizon. Furthermore, it can help opening up doors for potential women leaders of our universities and colleges by networking and honing skills.

The overall theme for the 2008 HERS Bryn Mawr Summer Institute was Leading People and Making Change in the Academic Environment. The faculty of the Summer Institute was composed of over forty senior officers from colleges and universities, national organizations, and accrediting associations. Their discussions and presentations revolved around four sub themes: Getting the big picture—Trends and challenges for the higher education today; Leading people with visions and plans; Gathering and using resources strategically; and Taking the HERS experience back to your campus. Interwoven with all these activities, the participants spent time on career mapping, including resume writing, creating the perfect cover letter and meeting with career advisors.

The Networking and Informals held every evening in the dormitory courtyard were essential for the bonding and camaraderie that developed among the participants. Now, a few months after the Summer Institute ended, several small reunions have already taken place. The network is alive and well—the HERS alumni serve as a sounding board for each other when they encounter challenges in their jobs, want to share accomplishments, are searching for new jobs or just want to chat. For more information about HERS, see www.hersnet.org.

Lost in America: Top Math Talent

American Mathematical Society, October 2008

Do females intrinsically have less ability than males to excel in mathematics at the very highest level? Conventional wisdom seems to say yes. Harvard University president Lawrence Summers also seemed to give credence to this notion in 2005 when he suggested that it might account in part for the very small number of women professors in elite university math departments.

But a new study proclaims a resounding "no," providing a fact-based case to back up this conclusion. The study, "Cross-Cultural Analysis of Students with Exceptional Talent in Mathematical Problem Solving," appearing in the November 2008 issue of the *Notices of the American Mathematical Society,* brings together decades of data from several extremely high-level mathematics competitions for young people. These data show that there exist many females with profound intrinsic ability in mathematics. What is more, whether this ability is identified and nurtured is highly dependent on socio-cultural, educational, or other environmental factors. In the United States, these factors keep many boys as well as most girls from developing their mathematical talents to the fullest.

Girl Math Whizzes Found in Cultures that Value Math

The main part of the study examines participation in the International Mathematical Olympiad (IMO), a highly challenging, nine-hour, six-problem essay style examination taken by some of the most mathematically gifted precollege students the world over. In recent years as many as

95 countries have sent six-member teams to compete in the IMO. The study found that there have been numerous girls who have excelled in the IMO; however, the frequency with which girls of medal-winning ability are identified varies greatly from country to country.

Even some relatively small countries, such as Bulgaria and Romania, can field highly successful IMO teams. "[W]hat most of these countries [that excel in the IMO] have in common are rigorous national mathematics curricula along with cultures and educational systems that value, encourage, and support students who excel in mathematics," the study says. Since 1974, the highly-ranked Bulgarian, East German/German, and USSR/Russian IMO teams have included 9, 10, and 13 different girls, respectively. By contrast, during that same time period, the US teams included just three girls. While only a few students per year typically achieve a perfect score of 42 points in this extremely difficult exam, multiple girls have been among them, including Evgenia Malinnikova of the USSR, who missed by only one point achieving a perfect 42 three years in a row.

One of the study's findings is that many of the students from the United States who participate in the IMO are immigrants or children of immigrants from countries where education in mathematics is valued and mathematical talent is nurtured. A similar pattern holds for data from other highly challenging math competitions, including the USA Mathematical Olympiad and the Putnam Mathematical Competition for undergraduate students, also analyzed in the study. In particular, Asian-American and white girls who are immigrants from Eastern Europe are well represented in proportion to their percentages of the US and Canadian populations among the very top students identified in these math competitions. It is only US- and Canadian-born white and historically underrepresented minority girls who are underrepresented—underrepresented by 50-fold or more relative to Asian girls educated in the same school systems, the study concludes.

The study found that, when raised under some conditions, girls constitute 11% to 24% of the children identified as having profound mathematical ability. Raised under other conditions, girls were 30-fold or more underrepresented. The 8:1 to 3:1 ratio of boys to girls is likely an underestimate. In a truly gender-neutral society, the real ratio could well be close to 1:1; however, we currently lack ways to measure it, the study suggests.

US Culture Discourages Girls—and Boys

Study co-author Titu Andreescu of the University of Texas at Dallas believes, "Innate math aptitude is probably fairly evenly distributed throughout the world, regardless of race or gender. The huge differences observed in achievement levels are most likely due to socio-cultural attributes specific to each country." Some countries routinely identify and nurture both boys and girls with profound mathematical ability to become world-class mathematical problem solvers, while others, including the USA, only rarely identify girls of this caliber. In addition, social pressures conspire to discourage girls from pursuing math. "[I]t is deemed uncool within the social context of USA middle and high schools to do mathematics for fun; doing so can lead to social ostracism," the report says. "Consequently, gifted girls, even more so than boys, usually camouflage their mathematical talent to fit in well with their peers."

Study co-author Titu Andreescu of the University of Texas at Dallas believes, "Innate math aptitude is probably fairly evenly distributed throughout the world, regardless of race or gender. The huge differences observed in achievement levels are most likely due to socio-cultural attributes specific to each country."

The study also looks at the representation of women among the faculty in five of the very top US research university mathematics departments. Just 20% of the women in these elite departments were born in the United States. Of the 80% born elsewhere, many are immigrants from countries in which girls are frequently members of IMO teams. The study found a similar race/ethnicity/birth country/gender profile among US participants in the IMO and its training camp as among the faculties of these outstanding math departments. "Thus, we conclude that the mathematics faculty being hired by these very highest-ranked research universities reflects the pool of IMO medal-caliber students of mathematics coming through the pipeline," the study says.

"The U.S. culture that is discouraging girls is also discouraging boys," says Janet Mertz, a University of Wisconsin-

Madison professor of oncology and lead author of the study. "The situation is becoming urgent. The data show that a majority of the top young mathematicians in this country, male as well as female, were not born here." Co-author Joseph A. Gallian, professor of mathematics at the University of Minnesota Duluth, says, "Just as there is concern about the US relying on foreign countries for our oil and manufactured goods, we should also be concerned about relying on others to fill our needs for mathematicians, engineers, and scientists."

"[T]he myth that females cannot excel in mathematics must be put to rest," the report emphasizes. "Teachers, guidance counselors, parents, principals, university presidents, the lay public, and, most importantly, girls themselves need to be informed about the fact that females can excel in mathematics, even at the very highest level."

About the Authors

The study authors have extensive experience in running successful programs for youngsters with a very high level of mathematical talent. Titu Andreescu is a former coach of the Romanian IMO team, former leader of the USA IMO team, former director of the US Mathematical Olympiad Summer Program, former member of the Putnam Committee, and current director of AwesomeMath, a summer program for mathematically gifted children. Joseph Gallian is current president of the Mathematical Association of America and has worked with more than 30 IMO medal winners in a summer research program at the University of Minnesota Duluth. Jonathan M. Kane, a professor of mathematics and computer science at the University of Wisconsin-Whitewater, is currently a member of the Committee on American Mathematics Competitions and the American Invitational Mathematics Examination Committee. Together with Andreescu, he also directs the Purple Comet Math Meet, an internet-run international math competition for middle and high school students. Janet E. Mertz is a biochemist who researches viruses and hormone receptors involved in cancers. She is famous as the inventor of a simple way to make recombinant DNAs that could be cloned. Together with Kane, she parented a child who excelled in all of the competitions discussed in this study.

Teaching as a Second Career

Woodrow Wilson National Fellowship Foundation, September 2008

Career changers may be one of the nation's best hopes to fill an anticipated 1.5 million teaching vacancies over the next decade, according to a new national survey released in September by the Woodrow Wilson National Fellowship Foundation and funded by MetLife Foundation.

The survey, *Teaching as a Second Career,* finds that 42 percent of college-educated Americans aged 24 to 60 would consider becoming a teacher. These potential teachers are more likely than others to have a postgraduate degree, to have attended selective colleges, and to report having higher-than-average grades than other college graduates, the report finds. The survey was conducted by Peter D. Hart Research Associates, Inc. and based on interviews with 2,292 college-educated adults aged 24 to 60.

"Career changers could help address persistent teacher shortages in hard-to-staff schools—given the right compensation and the right preparation," says Arthur Levine, president of the Woodrow Wilson National Fellowship Foundation. "While a number of programs have been created in the past 20 years to tap career changers as teachers, the nation needs to open teaching to a broader talent pool, and to recruit, prepare, and support those career changers more effectively."

Findings indicate that more people would consider teaching as a second career if starting salaries were raised to $50,000 and if career changers could receive quality training and support. Three in ten of those who are not interested in teaching say that teaching has appeal, but that there are aspects of teaching that prevent them from considering it, and low pay was the factor most often cited.

Even among those who are interested in teaching, low pay is their biggest concern about the field, and only 36 percent say a salary below $50,000 is acceptable to them. More than two in five (43 percent) of potential teachers said the most important step to encourage them to become a teacher is ensuring that salaries are adequate and competitive with other professions.

"Raising starting pay is the single most important step states and districts could take to increase the attractiveness of teaching for career changers," says Woodrow Wilson senior fellow David Haselkorn, who provided an introduction and commentary to the Hart Research study. "But money alone isn't the answer.

Potential teachers also want better working conditions and quality preparation programs that offer classroom experience, deeper content and pedagogical knowledge, and ongoing support once they enter teaching."

"Professionals from other fields are an untapped resource and could help schools solve crucial staffing problems in key shortage areas, such as math and science and hard-to-staff schools," notes Sibyl Jacobson, president of MetLife Foundation. "The survey identifies who we need to recruit and how and provides important clues into developing policies that will encourage more people to enter the teaching profession."

In addition to the survey, MetLife Foundation supported a new research synthesis, *Encore Performances.* The research synthesis reveals that few programs for college graduates and midcareer professionals design their coursework to match candidates' work experience and that clinical placements are often haphazard and unrelated to the needs of candidates' placements. This is consistent with survey findings. Roughly a fourth (23 percent) of potential teachers said developing the right kind of training to ease the transition to teaching is important.

Specifically, Encore Performances advises policymakers to create a channel for mid-career changers to explore teaching through preparation programs and short-term or part-time roles in schools, prior to making a high-stakes decision to switch careers.

The Woodrow Wilson National Fellowship Foundation is developing a national fellowship program and state fellowship initiatives to provide one-year fellowships for prospective teachers, who will be paid $30,000 stipends and receive a master's degree. After completing the graduate program, Fellows will teach for three years in a well-functioning, high-need school, during which they will receive mentoring from an expert teacher. After the program was described to them, two-thirds of potential teachers surveyed said they found it appealing. Women, African Americans, Hispanics, and those with lower incomes were the most likely to find the program appealing.

Who Are the Potential Teachers?

According to the survey, two-thirds of those interested in teaching said that they had considered the idea in the past, suggesting that a potential career switch has more than just casual appeal. Those working in engineering, science, and information technology are somewhat more likely than others to consider teaching, an important finding given the need for more teachers in STEM (science, technology, engineering, and mathematics) fields.

Although the vast majority of potential teachers say they consider teaching personally rewarding and it offers them a chance to make a difference, money matters. Those with incomes below $75,000 are more likely than those with higher incomes to consider teaching within the next five years, and 68 percent of potential teachers said teaching would mean a pay cut.

Nearly half of all the potential teachers among the respondents—most of whom are women and between 50 and 60—say they are considering teaching in the next five years. Fully three-fourths of this group had considered teaching in the past, suggesting that this group is the "low-hanging fruit" most ripe for recruitment into the field.

Potential teachers who would consider teaching within the next five years are somewhat more likely than the overall sample to have a postgraduate degree (32 percent compared to 29 percent), and 38 percent said they earned above-average grades at a selective college, compared with 30 percent of the total sample.

Preference for Teaching in High School, Suburban Areas

In looking at specific teaching positions, both in schools and in geographic settings, potential teachers favor more traditional schools and schools in suburban areas. Four in nine (45 percent) of the potential teachers find teaching in a high school to be extremely appealing, while 37 percent feel similarly about teaching in an elementary school.

Roughly three in 10 potential teachers find a school with children from low-income or disadvantaged backgrounds to be extremely appealing (32 percent) as well as a charter school (31 percent), or a low-performing school where there is a special need for quality teachers (30 percent). And only 15 percent of potential teachers say that they would find a teaching position working with special education students that have special needs to be extremely appealing.

A large plurality of potential teachers (47 percent) indicates that the area that the school is in does not make a difference. However, 35 percent would prefer a suburban school with just 11 percent indicating their preference for an urban school and 6 percent for a rural school.

Mission, Meaning, and Money Are Key Drivers

Although the vast majority of potential teachers say they consider teaching personally rewarding and it offers them a chance to make a difference, money matters. Those with incomes below $75,000 are more likely than those with higher incomes to consider teaching within the next five years, and 68 percent of potential teachers said teaching would mean a pay cut. When asked about the "sweet spot"—the salary they would need to consider teaching—21 percent said between $50,000 and $59,000, 24 percent said between $60,000 and $79,000, and 13 percent said $80,000 or more. Only 12 percent said between $20,000 and $39,000. According to the most recent publicly available data from the American Federation of Teachers, the average beginning salary for teachers in 2004–05 was $31,753.

Policy Actions

The research synthesis identifies specific policy recommendations, including creating a coherent system for mid-career changers to transition into teaching. That system should include preparation programs that are clinically based and tailored to adult learners; enable career changers to move through training and placement in cohorts that increase opportunities for collaborative learning and support; and expand opportunities for teacher candidates to explore teaching via well-supervised short-term or part-time roles in schools, prior to their making a high-stakes decision to switch careers. (See Recommendations from Encore Performances at http://www.woodrow.org/news/news_items/policy_recommendations.php.)

The survey, *Teaching as a Second Career,* was based on interviews of 2,292 adults conducted between February 5 and 25, 2008. To be eligible, interviewees had to be between the ages of 24 and 60 and hold at least a bachelor's degree. A total of 2,000 telephone interviews were conducted of this population, and an additional 292 on-line interviews were conducted for harder-to-reach groups, including 24- to 29-year-olds, Hispanics, and African Americans. The margin of error for the survey was 2.2 percentage points for the 2,000 interviews and 2.9 percentage points for the sample of 1,100 potential teachers.

Project NExT/YMN Poster Session

Project NExT and the Young Mathematician's Network invite submissions of abstracts for a poster session to be held on Tuesday, January 6, 2009 from 2:15 to 4:15 p.m. (room TBA) at the Joint Mathematics Meetings in Washington, D.C. The poster size will be 48″ by 36″; it is best to have the posters 36″ high. Posters and materials for posting pages on the posters will be provided on-site. We expect to accept about thirty posters from different areas within the mathematical sciences. If you have a special requirement involving a computer hook-up, let us know and we will see if it may be accommodated.

This poster session is intended to highlight the research activities, both mathematical and pedagogical, of recent or future Ph.D.'s in mathematics and related fields. The organizers seek to provide an open venue for people who are near completion or have finished their graduate studies in the last five years to present their work and make connections with other same-stage professionals, in much the same spirit as the YMN and Project NExT.

If you are interested in participating, submit copies of your abstract to: Prof. Mike Axtell, Department of Mathematics, OSS 201, University of St. Thomas, 2115 Summit Ave., St. Paul, MN 55105; phone: (651) 962-5495; e-mail: maxtell@stthomas.edu AND Prof. Kevin Charlwood, Department of Math & Statistics, Morgan Hall 275 I, Washburn University, Topeka, KS 66621; phone: (785) 670-1499; e-mail: kevin.charlwood@washburn.edu.

Our poster sessions the past twelve years have been great successes. Visitors to the session each year were numerous and included many prospective employers. This session provides an excellent way to showcase your work in a relaxed, informal environment.

The deadline for final consideration is **December 17, 2008**. Preference will be given to those who did not earn a Ph.D. prior to 2003; please include with your submission when and where you received your Ph.D., or indicate when you expect to receive it. Please submit your abstract via e-mail, not an attachment. If it includes mathematical formulas, submit it in basic LaTeX or TeX format. Submissions will be acknowledged quickly by e-mail. Accepted abstracts will be posted at http://www.youngmath.net/Documents/2009/Posters/ before the Joint Meetings.

AWM Workshop for Women Graduate Students and Recent Ph.D.'s

Supported by the Department of Energy, the Office of Naval Research, and the Association for Women in Mathematics

For many years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent Ph.D.'s in conjunction with major mathematics meetings.

WHEN: An AWM Workshop is scheduled to be held in conjunction with the SIAM Annual Meeting, Denver, CO, July 6–10, 2009.

FORMAT: The workshop will consist of a poster session by graduate students and two or three minisymposia featuring selected recent Ph.D.'s, plus an informational minisymposium directed at starting a career. The graduate student poster sessions will include all areas of research, but each research minisymposium will have a definite focus selected from the areas of Mathematical Biology, Modeling, Control, Optimization, Scientific Computing, and PDEs and Applications. AWM will offer funding for travel and two days subsistence for as many as twenty participants. Departments are urged to help graduate students and recent Ph.D.'s obtain supplementary institutional support to attend the workshop presentations and the associated meetings. All mathematicians (female and male) are invited to attend the program.

MENTORS: We also seek volunteers to lead discussion groups and to act as mentors for workshop participants. If you are interested in volunteering, please contact the AWM office.

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have begun work on her thesis problem, and a recent Ph.D. must have received her degree within approximately the last five years, whether or not she currently holds a postdoctoral or other academic or non-academic position. All non-US citizens must have a current US address. All selected and funded participants are invited and strongly encouraged to attend the full AWM two-day program. Those individuals selected will be notified by the AWM Office and will need to submit a final title and abstract with name, affiliation, address, etc. by mid-February to SIAM for the meeting program; AWM will provide instructions with the notification. For some advice on the application process from some of the conference organizers see the AWM website.

All applications should include:

- a cover letter
- a title and a brief abstract (75 words or less) of the proposed poster or talk
- a concise description of research (one or two pages)
- a curricultum vitae
- at least one letter of recommendation from a faculty member or research mathematician who knows the applicant's work is required for graduate students and recommended but not required for recent Ph.D.s. In particular, a graduate student should include a letter of recommendation from her thesis advisor.

Applications must be completed electronically by **January 2, 2009.**

See http://www.awm-math.org/workshop_application/application.html.

Association for Symbolic Logic
ASL Travel Awards

Student Travel Awards: The 2009 ASL Annual Meeting, 2009 ASL European Summer Meeting, and other ASL or ASL-Sponsored Meetings. The ASL will make available modest travel awards to graduate students in logic and (for the European Summer Meeting only) to recent Ph.D.'s so that they may attend the 2009 ASL Annual Meeting in Notre Dame, Indiana, or the 2009 ASL European Summer Meeting in Sofia, Bulgaria; see below for information about these meetings. Student members of the ASL also may apply for travel grants to other ASL or ASL-sponsored meetings. To be considered for a Travel Award, please (1) send a letter of application, and (2) ask your thesis supervisor to send a brief recommendation letter. The application letter should be brief (preferably one page) and should include: (1) your name; (2) your home institution; (3) your thesis supervisor's name; (4) a one-paragraph description of your studies and work in logic, and, in the case of an ASL student member application to attend an ASL or ASL-sponsored meeting other than the Annual Meeting or European Summer Meeting, a paragraph indicating why it is important to attend the meeting; (5) your estimate of the travel expenses you will incur; (6) (for citizens or residents of the USA) citizenship or visa status; and (7) (voluntary) indication of your gender and minority status. Women and members of minority groups are strongly encouraged to apply. In addition to funds provided by the ASL, the program of travel grants to the ASL Annual Meeting and the European Summer Meeting is supported by a grant from the US National Science Foundation; NSF funds may be awarded only to students at USA universities and to citizens and permanent residents of the USA. Air travel paid for using NSF funds must be on a US flag carrier. Application by email is encouraged; put "ASL travel application" in the subject line of your message.

For the 2009 ASL Annual Meeting, applications and recommendations should be received before the deadline of March 9, 2009, by the Program Chair: A. Urquhart, Dept. of Comp. Sci., Sandford Fleming Bldg., 10 King's College Rd., Univ. of Toronto, Toronto, Ontario M5S 3G4, CANADA; Fax: 416-978-8703; email: **urquhart@cs.toronto.edu**. Applications by email are preferred.

For the 2009 ASL European Summer Meeting, applications and recommendations should be received before the deadline of March 30, 2009, by the Organizing Committee: Logic Colloquium 2009, Dept. of Mathematical Logic, Faculty of Mathematics and Informatics, Sofia University, 5 James Bourchier Blvd., 1164 Sofia, Bulgaria; email: **lc2009@fmi.uni-sofia.bg**.

For ASL student member travel grants to other ASL or ASL-sponsored meetings, applications and recommendations should be received at least three months prior to the meeting at the ASL Business Office: ASL, Box 742, Vassar College, 124 Raymond Avenue, Poughkeepsie, New York 12604, USA; Fax: 1-845-437-7830; email: **asl@vassar.edu**. Decisions will be communicated at least two months prior to the meeting.

For further information about these meetings, and other ASL and ASL-sponsored meetings, visit the ASL website at
https://aslonline.org/Meetings.htm

ASL, Box 742, Vassar College
124 Raymond Ave., Poughkeepsie, NY 12604
Email: **asl@vassar.edu**; Fax: 845-437-7830
Also visit the ASL website: **http://www.aslonline.org.**

MSRI

The Mathematical Sciences Research Institute in Berkeley, California,
Solicits registration for participation in the upcoming 2009 workshops:

Connections for Women: Algebraic Geometry and Related Fields

(January 22, 2009 to January 24, 2009)

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.)

Deadline for Funding: December 05, 2008

Classical Algebraic Geometry Today

(January 26, 2009 to January 30, 2009)

Organized By:
Lucia Caporaso (U. Rome III), Brendan Hassett (Rice U.), James McKernan (MIT), Mircea Mustata (U. Michigan), Mihnea Popa (U. Illinois - Chicago)

Deadline for Funding: December 05, 2008

Algebraic Geometry is one of the most diverse areas of mathematics. Due to the breadth of the subject it is often a challenge for graduate students and people from other fields to get a global view of current developments in the field. Algebraic Geometry has grown dramatically over the past century, with new subfields constantly branching off. The core of the field is now universally called Classical Algebraic Geometry, an exciting area itself full of fundamental unsolved problems and at the same time providing a theoretical foundation for the areas that have developed in recent years.

The main theme of the workshops will be to explore modern approaches to problems originating in Classical Algebraic Geometry, and at the same time offer an introduction to various subfields to the younger participants in the semester-long program.

Students, recent Ph.D.'s, women, and minorities are particularly encouraged to apply. Funding awards are made typically 8 weeks before the workshop begins. Requests received after the funding deadlines are considered only if additional funds become available.

Further information can be found at **www.msri.org**

The Institute is committed to the principles of Equal Opportunity and Affirmative Action.

Research topic:
Arithmetic of L-functions

Education Theme:
Making Mathematical Connections

A three-week summer program for
graduate students
undergraduate students
mathematics researchers
undergraduate faculty
secondary school teachers
math education researchers

IAS/Park City Mathematics Institute (PCMI)
June 28 – July 18, 2009
Park City, Utah

Organizers: Cristian Popescu, University of California, San Diego; Karl Rubin, University of California, Irvine; and Alice Silverberg, University of California, Irvine.
Graduate Summer School Lecturers: David Burns, Kings College, London; Benedict Gross, Harvard University; Guido Kings, Regensburg University; Manfred Kolster, McMaster University; Cristian Popescu, University of California, San Diego; David Rohrlich, Boston University; Karl Rubin, University of California, Irvine; John Tate, University of Texas at Austin; Doug Ulmer, University of Arizona; and Vinayak Vatsal, University of British Columbia.
Clay Senior Scholars in Residence: Richard Gross, Harvard University; and John Tate, University of Texas at Austin.
Other Organizers: Undergraduate Summer School and Undergraduate Faculty Program: Aaron Bertram, University of Utah; and Andrew Bernoff, Harvey Mudd College. Secondary School Teachers Program: Gail Burrill, Michigan State University; Carol Hattan, Vancouver, WA; and James King, University of Washington.

Applications: pcmi.ias.edu
Deadline: January 28, 2009
IAS/Park City Mathematics Institute
Institute for Advanced Study, Princeton, NJ 08540
Financial Support Available

UNIVERSITY AT ALBANY
State University of New York

Assistant Professor Mathematics and Statistics

Applications are invited for a tenure track position at the Assistant Professor level beginning in the Fall semester, 2009. Preference will be given to candidates who show promise of interacting with the established research groups in the Department in algebra, analysis, topology and probability/statistics and of contributing to our degree programs. Of particular interest are candidates with experience in actuarial mathematics who can help in developing our programs in actuarial science. Applicants should have a Ph.D. in mathematics or related field (completed by September 1, 2009), a strong record and/or promise in research, excellence in teaching, and ability to contribute to and enrich the undergraduate and graduate programs. The Department offers BS and BA baccalaureate degrees as well as a BS in Actuarial and Mathematical Sciences and a BS in Computer Science and Applied Mathematics, joint with Computer Science, and two graduate degrees, MA and Ph.D. The salary will be commensurate with experience.

Applications should be sent to: **Edward C. Turner, Chair, Department of Mathematics and Statistics, University at Albany, Albany, NY, 12222**. A complete application includes a vitae, statements on research and teaching, and at least three letters of recommendation commenting on both research and teaching. The Department will also consider other material such as reprints that the candidate deems appropriate, but we will not accept electronic submissions. Though our filing deadline for guaranteed consideration is December 15, 2008, the Department will review later applications until the position is filled, and all files will remain active for possible visiting appointments. A final decision to hire is subject to budgetary approval.

The University at Albany is an EEO/AA/IRCA/ADA employer.

The Ohio State University

College of Mathematical and Physical Sciences

Department of Mathematics

The Department of Mathematics in the College of Mathematical and Physical Sciences at The Ohio State University expects to have openings at both the junior and senior level in the area of mathematical and computational biology.

Applicants should have a PhD in mathematics or a related area, such as mathematical sciences, biomathematics, biology, chemistry, computer science, physics, and engineering and should show outstanding promise and/or accomplishments in both research and teaching. The successful candidate will be expected to teach courses in the Mathematics Department and actively participate in the Mathematical Biosciences Institute. Further information on the Department and the MBI can be found at http://www.math.ohio-state.edu and http://mbi.osu.edu Flexible work options available.

Previous research experience is desired.

THE OHIO STATE UNIVERSITY

Applications should be submitted online at http://www.mathjobs.org. Applications are considered on a continuing basis but the annual review process begins November 17, 2008. If you cannot apply online, please contact facultysearch@math.ohio-state.edu Senior candidates should arrange for at least five letters of recommendation and junior candidates should arrange for at least three letters of recommendation.

To build a diverse workforce, Ohio State encourages applications from minorities, veterans, women, and individuals with disabilities. EEO/AA Employer.

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AMERICAN UNIVERSITY —Two tenure-track positions in the Mathematics/Statistics department at American University at the rank of Assistant Professor or Associate Professor, beginning Fall 2009. Qualified candidates will have a strong background in mathematics or statistics with a PhD, teaching experience is required. American University is an EEO/AA employer. Minority and women candidates are encouraged to apply. See math.american.edu/positions, or contact the Department of Mathematics and Statistics at (202) 885-3120 for details.

BOSTON COLLEGE — Tenure-Track Positions in Number Theory and in Geometry/Topology — The Department of Mathematics at Boston College invites applications for two tenure-track positions at the level of Assistant Professor beginning in September 2009, one in Number Theory and the second in Geometry/Topology. In exceptional cases, a higher level appointment may be considered. The teaching load for each position is three semester courses per year. Requirements include a Ph.D. or equivalent in Mathematics awarded in 2007 or earlier, a record of strong research combined with outstanding research potential, and demonstrated excellence in teaching mathematics. A completed application should contain a cover letter, a description of research plans, a statement of teaching philosophy, curriculum vitae, and at least four letters of recommendation. One or more of the letters of recommendation should directly comment on the candidate's teaching credentials. Applications completed no later than **December 1, 2008** will be assured our fullest consideration. Please submit all application materials through MathJobs.org. If necessary, printed materials may otherwise be sent to: Chair, Search Committee in Number Theory (resp. in Geometry/Topology) Department of Mathematics Boston College Chestnut Hill, MA 02467-3806 Applicants may learn more about the Department, its Faculty and its programs at www.bc.edu/math. Electronic inquiries concerning these positions may be directed to math-search-nt@bc.edu or math-search-gt@bc.edu. Boston College is an Affirmative Action/Equal Opportunity Employer. Applications from women, minorities and individuals with disabilities are encouraged.

BROWN UNIVERSITY — J. D. Tamarkin Assistant Professorship — One three-year non-tenured non-renewable appointment, beginning July 1, 2009. The teaching load is one course one semester, and two courses the other semester and consists of courses of more than routine interest. Candidates are required to have received a Ph.D. degree or equivalent by the start of their appointment, and they may have up to three years of prior academic and/or postdoctoral research experience. Applicants should have strong research potential and a commitment to teaching. Field of research should be consonant with the current research interests of the department. For full consideration, applicants must submit a curriculum vitæ, an AMS Standard Cover Sheet and three letters of recommendation by **December 1, 2008**. Please submit all application materials on line at http://www.mathjobs.org. If necessary, inquiries and materials can be addressed to: Junior Search Committee, Department of Mathematics, Box 1917, Brown University, Providence, RI 02912. Email inquiries should be addressed to juniorsearch@math.brown.edu. Brown University is an Equal Opportunity/Affirmative Action Employer and encourages applications from women and minorities.

BROWN UNIVERSITY — Division of Applied Mathematics, Position in Applied Mathematics — The Division of Applied Mathematics seeks applicants for a position at the tenure track (Assistant Professor) level. Areas of emphasis include pattern theory, mathematical modeling, and optimization and control of PDE. The starting date for the position is July 1, 2009. Postdoctoral experience is required. Good communication and teaching skills are required. Applicants should submit curriculum vitae, representative preprints and reprints, and a concise description of research interests and goals to: Attn: Faculty Search, Professor Paul Dupuis, Chairman, Division of Applied Mathematics, Brown University, PO BOX F, Providence, Rhode Island 02912. Applicants should arrange to have at least three letters of recommendation sent directly to the Search Committee at the same address. To receive full consideration, complete applications should be received by November 16, 2008. Applications received after this date may still be considered at the discretion of the committee. Brown University is an affirmative-action/equal-opportunity employer. Women and minorities are encouraged to apply.

BRYN MAWR COLLEGE — Continuing Non-tenure Track Position of Math Program Coordinator —The Department of Mathematics invites applications for a continuing non-tenure track position of Math Program Coordinator to begin July 1, 2009. The position is a three-year appointment. It can be renewed for multiple terms. An MA/MS in Mathematics is required, though a PhD in Mathematics is preferred. We are seeking an enthusiastic individual with excellent teaching, communication, and administrative skills. The successful candidate will work with our department to provide our students with a comfortable transition from high school to college, will encourage them to pursue mathematics beyond the elementary level, and will coordinate departmental organizations and activities. Applicants must share our dedication to opening young women's minds to mathematics while enhancing their abilities to think both deeply and broadly. See http://www.brynmawr.edu/math for a more detailed description of the department and the position. Applicants with excellent teaching and administrative skills should arrange to have a cover letter, a curriculum vita, a statement of teaching interests and philosophy, a list of mathematics courses taken and taught, official undergraduate and graduate transcripts, and at least three reference letters sent to: Search Committee, Department of Mathematics, Bryn Mawr College, 101 N. Merion Avenue, Bryn Mawr, PA 19010-2899. Applications may also be submitted online through http://mathjobs.org. Applications should be complete by **December 15, 2008**. Located in suburban Philadelphia, Bryn Mawr College is a highly selective liberal arts college for women who share an intense intellectual commitment, a self-directed and purposeful vision of their lives, and a desire to make meaningful contributions to the world. Bryn Mawr comprises an undergraduate college with 1,200 students, as well as coeducational graduate schools in some humanities, sciences, and social work. The College participates in a consortium together with Haverford and Swarthmore Colleges and the University of Pennsylvania. Bryn Mawr College is an Equal Opportunity, Affirmative Action Employer. Minority candidates and women are especially encouraged to apply.

CARLETON COLLEGE — Tenure-track position in Mathematics — Carleton College Department of Mathematics has a tenure-track position in Mathematics at the Assistant Professor level, to begin September 1, 2009. Details, including application instructions, can be found at www.mathjobs.org and the College website https://apps.carleton.edu/campus/doc/position_openings/?job_id=452087 Carleton is an affirmative action/equal opportunity employer. We are committed to developing our faculty to better reflect the diversity of our student body and American society. Women and members of minority groups are strongly encouraged to apply. Review of applications will begin **December 1, 2008** and continue until the position is filled.

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CASE WESTERN RESERVE UNIVERSITY — Tenure-track Position (rank open, junior preferred) Algebra — The Department of Mathematics at Case Western Reserve University anticipates at least one new tenure-track position (rank open, junior preferred). Applications are encouraged from any area of mathematics. Preference will be given to candidates in the areas of algebra, broadly construed. Algebra-related fields may include, but are not limited to, algebraic geometry, algebraic topology, number theory, operator algebras, group representation theory, and combinatorics. Exceptional candidates in other areas of mathematics will also be considered. Above the rank of assistant professor, a strong publication record is required. Candidates should hold a PhD in Mathematics by the time of appointment, demonstrated teaching experience, and a publication record appropriate to rank. The normal teaching load is two courses per semester. Candidates should submit a letter of application, curriculum vitae and arrange for three letters of recommendation to be submitted directly. In addition, a statement of teaching philosophy and experience, evidence of teaching excellence, and a statement of current and future research plans should be included as part of the application dossier. All application materials should be submitted electronically through the AMS website mathjobs.org or mailed to Faculty Search Department of Mathematics Case Western Reserve University 10900 Euclid Avenue Cleveland, OH 44106. More detailed information regarding the Department may be found on the website: http://www.cwru.edu/artsci/math/ Women and minority candidates are encouraged to apply. Case Western Reserve University is supportive of the needs of dual career couples and is an Equal Opportunity /Affirmative Action Employer. The application process will continue until the position is filled but interested applicants are encouraged to apply by **November 15, 2008**, when the review process will begin. Case Western Reserve University is located in the attractive University Circle cultural district of Cleveland Ohio, home of the internationally famous Cleveland Orchestra, the Cleveland Museum of Art, the Cleveland Institute of Music, the Cleveland Institute of Art. Within a five-mile radius of campus are the nation's second largest theater district, multiple professional sports teams, a wide range of musical, artistic, and culinary venues, and numerous, diverse communities in which to live. Items to be submitted through MathJobs.org * Cover Letter * Curriculum Vitae * Research Statement * Teaching Statement * Publication List * 3 Reference Letters (submitted directly by writers)

CASE WESTERN RESERVE UNIVERSITY — Tenure-track Position (rank open, junior preferred) Applied Mathematics — The Department of Mathematics at Case Western Reserve University anticipates at least one new tenure track (rank open, junior preferred). Applications are encouraged from any area of applied, computational, or interdisciplinary mathematics. Preference will be given to candidates with interest in the areas of life sciences and energy research. Exceptional candidates in other areas of applied and computational mathematics will also be considered. Above the rank of assistant professor, a strong publication record is required. Candidates should hold a Ph.D. in Mathematics or a related field by the time of appointment, demonstrated teaching experience, and a publication record appropriate to rank. The normal teaching load is two courses per semester. Candidates should submit a letter of application, curriculum vitae and arrange for three letters of recommendation to be submitted directly. In addition, a statement of teaching philosophy and experience, evidence of teaching excellence, and a statement of current and future research plans should be included as part of the application. All application materials should be submitted electronically through the AMS website mathjobs.org or mailed to Faculty Search Department of Mathematics Case Western Reserve University 10900 Euclid Avenue Cleveland, OH 44106 More detailed information regarding the Department may be found on our website: http://www.cwru.edu/artsci/math/ Women and minority candidates are encouraged to apply. Case Western Reserve University is supportive of the needs of dual career couples and is an Equal Opportunity /Affirmative Action Employer. The application process will continue until the position is filled but interested applicants are encouraged to apply by November 15, 2008, when the review process will begin. Case Western Reserve University is located in the University Circle cultural district of Cleveland Ohio, home of the internationally-famous Cleveland Orchestra, the Cleveland Museum of Art, the Cleveland Institute of Music, the Cleveland Institute of Art. Within a five-mile radius of campus are the nation's second largest theater district, multiple professional sports teams, a wide range of musical, artistic, and culinary venues, and numerous, diverse communities in which to live. Items to be submitted for the application * Cover Letter * Curriculum Vitae * Research Statement * Teaching Statement * Publication List * 3 Reference Letters (submitted directly by writers)

CLARKSON UNIVERSITY — Tenure-track Position in Applied Mathematics — The Division of Mathematics and Computer Science (www.clarkson.edu/mcs) invites applications for a tenure-track position in applied mathematics starting in August 2009 at the Associate or Full Professor level. We are especially interested in candidates with expertise in computational areas of applied mathematics, including statistics, or dynamical systems, but all areas of applied mathematics will be considered. Responsibilities will include teaching undergraduate and graduate level mathematics courses, and directing graduate students. For this position, demonstrated excellence in both research, including a record of funding, and teaching are required. In addition, the candidate should be able to interact with other faculty in the department and the university. Applications including vita and three reference letters should be submitted to Prof. P.A. Turner, Department of Mathematics and Computer Science, Clarkson University, Potsdam, NY 13699-5815. Completed applications will be reviewed starting immediately. Women and minorities are urged to apply. Clarkson University is an AA/EOE Employer. (Pos. # 41-08)

DARTMOUTH COLLEGE — John Wesley Young Research Instructorship — 2-3 years, new or recent Ph.D. graduates whose research overlaps a department member's. Teach 4 ten-week courses spread over 3 terms. Appointment for 26 months, with possible 12 month renewal; monthly salary of $4,833, including two-month research stipend for Instructors in residence during 2 of 3 summer months; if not in residence, salary adjusted accordingly. To initiate an application go to http://www.mathjobs.org – Position ID: 237-JWY. You can also access the application through a link at http://www.math.dartmouth.edu/recruiting/. General inquiries can be directed to Annette Luce, Department of Mathematics, Dartmouth College, 6188 Kemeny Hall, Hanover, New Hampshire 03755-3551. Files complete by **January 5, 2009** considered first. Dartmouth College is committed to diversity and strongly encourages applications from women and minorities.

DEPAUW UNIVERSITY — Two Tenure-track Positions — Department of Mathematics. DePauw University. Statistics and Applied Mathematics. Two tenure-track positions starting August 2009; rank and salary commensurate with credentials and experience. Ph.D. preferred, ABD considered. For one position, doctoral work in statistics required; for other position doctoral work in mathematics or statistics required. Demonstrated effectiveness in teaching at undergraduate level and interest in supporting undergraduate research required. Backgrounds in both statistics and applied areas of mathematics preferred. Teaching will include calculus, discrete mathematics and statistics, and upper-level courses in area of expertise. For more information and application instructions, see http://www.depauw.edu/admin/acadaffairs/positions/. Review of applications begins **December 5, 2008** and continues until position is filled. DePauw University is an Equal Employment Opportunity Employer. Women and members of underrepresented groups are encouraged to apply.

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DREXEL UNIVERSITY — Tenure-track/Tenure Positions — The Department of Mathematics at Drexel University invites applications for at least two tenure-track/tenure positions, effective September 2009. We are especially interested in candidates in Probability, Combinatorics, Dynamical Systems, Mathematical Biology, Partial Differential Equations, and Computational Mathematics, though exceptional candidates in other areas will be considered as well. Applicants must possess a doctoral degree in mathematics, statistics, or equivalent and show a strong record and commitment to research and teaching. Applicants for senior positions should demonstrate an outstanding record of achievement commensurate with the level of appointment, including a track record of external support and research group leadership. Drexel University is a private, urban university, with over 10,000 full-time undergraduates and is well-known for its co-operative education program. The Mathematics Department offers undergraduate, masters and PhD degrees. To apply for this position please visit https://www.mathjobs.org/jobs/157/1280 and follow instructions to submit all relevant materials online. These include: AMS cover sheet, letter of application, vita, statement of research program and evidence of teaching effectiveness and at least three letters of reference. Review of applications will begin **December 1, 2008** and continue until the positions are filled. Drexel University is an Equal Opportunity/Affirmative Action Employer.

FIELDS INSTITUTE — Postdoctoral Fellowships —Applications are invited for postdoctoral fellowship positions for the 2009-2010 academic year. The (Fall 2009) Thematic Program on Foundations of Computational Mathematics will take place at the Institute July to December 2009 and the (Winter/Spring 2010) Thematic Program on Quantitative Finance: Foundations and Applications will take place at the Institute from January to June 2010. The fellowships may be offered in conjunction with partner universities, through which a further period of support may be possible. One visitor for each six-month program will be awarded the Institute's prestigious Jerrold E. Marsden Postdoctoral Fellowship. Eligibility: Qualified candidates who will have recently completed a PhD in a related area of the mathematical sciences are encouraged to apply. Deadline: **December 15, 2008**. Application Information: www.fields.utoronto.ca/proposals/postdoc.html The Fields Institute is strongly committed to diversity within its community and especially welcomes applications from women, visible minority group members, Aboriginal persons, persons with disabilities, members of sexual minority groups, and others who may contribute to the further diversification of ideas.

INSTITUTE FOR PURE AND APPLIED MATHEMATICS, UCLA — The Institute for Pure and Applied Mathematics (IPAM) at UCLA is seeking a second Associate Director (AD), to begin a two-year appointment on July 1, 2009. The AD is expected to be an active and established research mathematician or scientist in a related field, with experience in conference organization. The primary responsibility of the AD will be running programs in coordination with the organizing committees. For a detailed job description and application instructions, go to www.ipam.ucla.edu/jobopenings/assocdirector.aspx. Applications will receive fullest consideration if received by **February 1, 2009**. UCLA is an equal opportunity/affirmative action employer.

JOHNS HOPKINS UNIVERSITY — Associate Professor or Full Professor Positions — The Department of Mathematics invites applications for one or more positions at the Associate Professor or Full Professor level in general areas of analysis, algebra, topology, number theory, and mathematical physics beginning Fall 2009 or later. To submit your applications go to www.mathjobs.org/jobs/jhu. Applicants are strongly advised to submit their other materials electronically at this site. If you do not have computer access, you may mail your application to: Appointments Committee, Department of Mathematics, Johns Hopkins University, 404 Krieger Hall, Baltimore, MD 21218. Application should include a vita, at least four letters of recommendation of which one specifically comments on teaching, and a description of current and planned research. Write to cpoole@jhu.edu for questions concerning these positions. Applications received by **November 17, 2008** will be given priority. The Johns Hopkins University is an Affirmative Action/Equal Opportunity Employer. Minorities and women candidates are encouraged to apply.

JOHNS HOPKINS UNIVERSITY — Non-Tenure-Track J.J. Sylvester Assistant Professor — Subject to availability of resources and administrative approval, the Department of Mathematics solicits applications for non-tenure-track Assistant Professor positions beginning Fall 2009. The J.J. Sylvester Assistant Professorship is a three-year position offered to recent Ph.D.'s with outstanding research potential. Candidates in all areas of pure mathematics, including analysis, mathematical physics, geometric analysis, complex and algebraic geometry, number theory, and topology are encouraged to apply. The teaching load is three courses per academic year. To submit your applications go to www.mathjobs.org/jobs/jhu. Applicants are strongly advised to submit their other materials electronically at this site. If you do not have compute access, you may mail your application to: Appointments Committee, Department of Mathematics, Johns Hopkins University, 404 Krieger Hall, Baltimore, MD 21218. Application should include a vita, at least four letters of recommendation of which one specifically comments on teaching, and a description of current and planned research. Write to cpoole@jhu.edu for questions concerning these positions. Applications received by **November 17, 2008** will be given priority. The Johns Hopkins University is an Affirmative Action/Equal Opportunity Employer. Minorities and women candidates are encouraged to apply

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — Assistant Professor or higher positions — The Mathematics Department at MIT is seeking to fill positions at the level of Assistant Professor or higher for September 2009. Appointments are based on exceptional research contributions in pure mathematics. Appointees will be expected to fulfill teaching duties and pursue their own research program. PhD required by employment start-date. We request that applications and other materials, including (a) curriculum vitae, (b) research description, and (c) three letters of recommendation be submitted online at www.mathjobs.org. Applications should be complete by **December 1, 2008** to receive full consideration. We request that your reference letters be submitted by reviewers online via mathjobs. We will also accept recommendations sent as PDF attachments to pure@math.mit.edu, or in hardcopy mailed to: Pure Mathematics Committee, Room 2-345, Department of Mathematics, MIT, 77 Massachusetts Ave., Cambridge, MA 02139-4307. Please do not mail or email duplicates of items already submitted via mathjobs. MIT is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — C.L.E. Moore Instructorships in Mathematics — These positions for September 2009 are open to mathematicians who show definite promise in research. Applicants with PhD's after June 2008 are strongly preferred. Appointees will be expected to fulfill teaching duties and pursue their own research program. We request that applications and other materials, including (a) curriculum vitae, (b) research description, and (c) three letters of recommendation, be submitted online at www.mathjobs.org. Applications should be complete by **December 1, 2008** to receive full consideration. We request that your letters of reference be sub-mitted by the reviewers online via mathjobs. We will also accept recommendations either as PDF attachments sent to pure@math.mit.edu, or as paper copies mailed to: Pure Mathematics Committee, Room 2-345, Department of Mathematics, MIT, 77 Massachusetts Ave., Cambridge, MA 02139-4307. Please do not mail or email duplicates of items already submitted via mathjobs. MIT is an Equal Opportunity, Affirmative Action Employer.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY — Applied Mathematics Positions —The applied mathematics group at MIT is seeking to fill combined teaching and research positions at the level of Instructor, Assistant Professor or higher, beginning September 2009. PhD required by employment start-date. Appointments are mainly based on exceptional research qualifications. Candidates in all areas of applied mathematics, including physical applied mathematics, computational molecular biology, numerical analysis, scientific computation, and theoretical computer science will be considered. Current activities of the group include: combinatorics, operations research, theory of algorithms, numerical analysis, astrophysics, condensed matter physics, computational physics, fluid dynamics, geophysics, nonlinear waves, theoretical and computational molecular biology, material sciences, quantum computing and quantum field theory, but new hiring may involve other areas as well. We request that applications and other materials, including (a) curriculum vitae, (b) research description, and (c) three letters of recommendation be submitted online at www.mathjobs.org, preferably well in advance of our deadline of **January 1, 2009** since we will begin our deliberations in December. We request that your reference letters be submitted by reviewers online via mathjobs. We will also accept recommendations sent as PDF attachments to applied@math.mit.edu, or in hardcopy mailed to: Applied Mathematics Committee, Room 2-345, Department of Mathematics, MIT, 77 Massachusetts Ave., Cambridge, MA 02139-4307. Please do not mail or email duplicates of items already submitted via mathjobs. MIT is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — Statistics and Applied Probability Positions — The Department of Mathematics at MIT is seeking to fill combined teaching and research positions at the level of Instructor, Assistant Professor or higher in STATISTICS or APPLIED PROBABILITY beginning September 2009. Appointments are mainly based on exceptional research qualifications. PhD required by employment start-date. We request that applications and other materials, including (a) cur**riculum vitae, (b) research description, and (c) three letters of recommendation be submitted online at www.mathjobs.org. Applications should be complete by** January 1, 2009 to receive full consideration. We request that your reference letters be submitted by reviewers online via mathjobs. We will also accept recommendations sent as PDF attachments to statistics@math.mit.edu, or in hardcopy mailed to: Committee on Statistics, Room 2-345, Department of Mathematics, MIT, 77 Massachusetts Ave., Cambridge, MA 02139-4307. Please do not mail or email duplicates of items already submitted via mathjobs. MIT is an Equal Opportunity, Affirmative Action Employer.

MILLERSVILLE UNIVERSITY — Geometry/Topology — Full-time, tenure-track Assistant Professor position beginning August 2009. Duties include an annual 24-hour teaching load, scholarly activity, student advisement, curriculum development and committee work. Required: Ph.D. (or completion by date of appointment) in mathematics with expertise in geometry or topology. Must exhibit evidence of strong commitment to excellence in teaching and continued scholarly activity; must be prepared to teach a broad spectrum of undergraduate mathematics courses and to teach undergraduate geometry as it relates to the preparation of teachers. Must complete successful interview and teaching demonstration. Preferred: Evidence of commitment to working in a diverse environment. Full consideration given to applications received by **January 21, 2009**. E-mail applications will not be accepted. Send application letter that addresses the position requirements, vita, copies of undergraduate and graduate transcripts and three letters of reference (at least two of which attest to recent teaching effectiveness) to: Dr. Noel Heitmann, Search Committee, Department of Mathematics/AWM1208, Millersville University, P. O. Box 1002, Millersville, PA 17551-0302. An EO/AA Institution www.millersville.edu

PURDUE UNIVERSITY — Faculty Position in Statistics — The Department of Statistics at Purdue University invites applications in all areas of statistics and probability for a faculty position beginning August 2009. This position is available at the Assistant Professor level; the Associate level will be considered for highly qualified applicants. Applicants in core areas of statistics and probability, as well as interdisciplinary areas are encouraged to apply. The Department of Statistics offers a stimulating and nurturing academic environment. More than thirty-five tenured and tenure-track faculty members direct research programs in a broad range of areas. Further information about the department is available at: http://www.stat.purdue.edu. All applicants should hold a PhD in Statistics, or a related field, be committed to excellence in teaching, and demonstrate strong potential for excellence in research. Salary and benefits are highly competitive. Review of applications will begin on **December 1, 2008**, and will continue until the position is filled. To apply, or to see all positions in Statistics, please visit http://www.stat.purdue.edu/hiring/ Purdue University is an Equal Opportunity/Equal Access/Affirmative Action employer fully committed to achieving a diverse workforce.

PURDUE UNIVERSITY — Faculty Position in Statistics — Applications are invited for a faculty position in the Department of Statistics, beginning August 2009, with a joint appointment in the Regenstrief Center for Healthcare Engineering. Appointment could be made at the Assistant, Associate, or Full Professor rank depending upon the successful candidate's skills and experience. The Department of Statistics offers a stimulating and nurturing academic environment. More than thirty tenured and tenure-track faculty members direct research programs in a broad range of areas. Further information about the department is available at: http://www.stat.purdue.edu. The Regenstrief Center for Healthcare Engineering is an integrated university-wide effort devoted to the study of healthcare delivery. Further information about the center is available at http://www.purdue.edu/discoverypark/rche/ All applicants should hold a Ph.D. in Biostatistics, Statistics, or a related field, be committed to excellence in teaching, and have demonstrated strong potential for excellence in biomedical related research that may include analysis of large existing data sets, data mining, active learning, longitudinal or hierarchical linear modeling, and design of experiments. Postdoctoral or relevant work experience is a plus. Excellent communication skills are necessary as there are multiple opportunities to interact with a broad range of established healthcare provider alliances throughout the United States. Salary and benefits are highly competitive. Review of applications will begin on **December 1, 2008**, and will continue until the position is filled. For all positions in Statistics, please visit http://www.stat.purdue.edu/hiring/ to apply. Purdue University is an Equal Opportunity/Equal Access/Affirmative Action employer fully committed to achieving a diverse workforce.

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RUTGERS UNIVERSITY-NEW BRUNSWICK — The Mathematics Department of Rutgers University-New Brunswick invites applications for the following positions which may be available September 2009. TENURED POSITION: Subject to availability of funding, the Department expects one or more openings at the level of Associate Professor or Professor. Candidates must have the Ph.D. and show a sustained record of outstanding research accomplishments in pure or applied mathematics, and concern for teaching. Outstanding candidates in any field of pure or applied mathematics will be considered. In addition, candidates should show outstanding leadership in research. The normal annual teaching load for research-active faculty is 2-1, that is, two courses for one semester, plus one course for the other semester. Review of applications begins immediately. TENURE-TRACK ASSISTANT PROFESSORSHIP: Subject to availability of funding, the Department may have one or more openings at the level of Tenure-Track Assistant Professor. Candidates must have the Ph.D. and show a sustained record of outstanding research accomplishments in pure or applied mathematics, and concern for teaching. Outstanding candidates in any field of pure or applied mathematics will be considered. The normal annual teaching load for research-active faculty is 2-1, that is, two courses for one semester, plus one course for the other semester. Review of applications begins **November 1**. HILL ASSISTANT PROFESSORSHIP and NON-TENURE-TRACK ASSISTANT PROFESSORSHIP: These are both three-year nonrenewable positions. Subject to availability of funding, the Department may have one or more open positions of these types. The Hill Assistant Professorship carries a reduced teaching load of 2-1 for research; candidates for it should have received the Ph.D., show outstanding promise of research ability in pure or applied mathematics, and have concern for teaching. The Non-Tenure-Track Assistant Professorship carries a teaching load of 2-2; candidates for it should show evidence of superior teaching accomplishments and promise of research ability. Review of applications begins **December 1, 2008**. Applicants for the above position(s) should submit a curriculum vitae (including a publication list) and arrange for four letters of reference to be submitted, one of which evaluates teaching. Applicants should first go to the website https://www.mathjobs.org/jobs and fill out the AMS Cover Sheet electronically. It is essential to fill out the cover sheet completely, including naming the positions being applied for (TP, TTAP, HILL, NTTAP, respectively) giving the AMS Subject Classification number(s) of area(s) of specialization, and answering the question about how materials are being submitted. The strongly preferred way to submit the CV, references, and any other application materials is online at https://www.mathjobs.org/jobs. If necessary, however, application materials may instead be mailed to: Search Committee, Dept. of Math-Hill Center, Rutgers University, 110 Frelinghuysen Road, Piscataway, NJ 08854-8019. Review of applications will begin on the dates indicated above, and will continue until openings are filled. Updates on these positions will appear on the Rutgers Mathematics Department webpage at http://www.math.rutgers.edu. Rutgers is an Affirmative Action/Equal Opportunity Employer and encourages applications from women and minority-group members.

SYRACUSE UNIVERSITY — Tenure-track Position in Statistics at the Assistant Professor level — The department seeks to fill a tenure-track position in statistics at the assistant professor level, beginning August, 2009. Ph.D. in mathematics or statistics required. Candidates should have a record of strong accomplishment and potential in both research and teaching. While applications from all areas of statistics areencouraged, the department is particularly interested in receiving applications from individuals working in the area of computational statistics. Preference will also be given to candidates whose research interests overlap and/or complement those of existing faculty. See http://math.syr.edu for more information.How to Apply: 1. Candidates should visit https://www.sujobopps.com to read the detailed faculty postings and submit a brief online faculty application with a CV in order to be considered. 2.) SEND A COVER LETTER, CV, THREE LETTERS OF RECOMMENDATION ADDRESSING RESEARCH QUALIFICATIONS, AND AT LEAST ONE LETTER OF RECOMMENDATION ADDRESSING TEACHING TO: Chair, Department of Mathematics, Syracuse University, Syracuse, NY, 13244. For full consideration, documents should be received by **January 15, 2009**. Syracuse University is an Equal Opportunity/Affirmative Action Employer committed to fostering a diverse faculty; women and minority candidates are especially encouraged to apply.

SYRACUSE UNIVERSITY — Tenure-track Position in Topology or Geometry at the Assistant Professor level —The department seeks to fill a tenure-track position in topology or geometry at the assistant professor level, beginning August, 2009. Ph.D. in mathematics required. Candidates should have a record of strong accomplishment and potential in both research and teaching. Although preference will be given to candidates in topology or geometry, exceptional candidates in all areas will be considered. Preference will also be given to candidates whose research interests overlap and/or complement those of existing faculty. Areas of topology and geometry presently represented in the department include algebraic geometry, algebraic topology, geometric topology, and differential geometry. See http://math.syr.edu for more information. How to Apply: 1. Candidates should visit https://www.sujobopps.com to read the detailed faculty postings and submit a brief online faculty application with a CV in order to be considered for the position. 2.) SEND A COVER LETTER, CV, THREE LETTERS OF RECOMMENDATION ADDRESSING RESEARCH QUALIFICATIONS, AND AT LEAST ONE LETTER OF RECOMMENDATION ADDRESSING TEACHING TO: Chair, Department of Mathematics, Syracuse University, Syracuse, NY, 13244. For full consideration, documents should be received by **January 15, 2009**. Syracuse University is an Equal Opportunity/Affirmative Action Employer committed to fostering a diverse faculty; women and minority candidates are especially encouraged to apply.

TEXAS A&M UNIVERSITY — Tenure-eligible and Visiting Faculty Positions — The Department of Mathematics anticipates several openings for tenured, tenure-eligible, and visiting faculty positions beginning fall 2009. The field is open, but we particularly seek applications from individuals whose mathematical interests would augment and build upon existing strengths both within the Mathematics Department as well as other departments in the University. Salary, teaching loads and start-up funds are competitive. For a Tenured Position the applicant should have an outstanding research reputation and would be expected to fill a leadership role in the department. An established research program, including success in attracting external funding and supervision of graduate students, and a demonstrated ability and interest in teaching are required. Informal inquiries are welcome. For an Assistant Professorship, we seek strong research potential and evidence of excellence in teaching. Research productivity beyond the doctoral dissertation will normally be expected. We also have several visiting positions available. Our Visiting Assistant Professor positions are three-year appointments and carry a three course per year teaching load. They are intended for those who have recently received their Ph.D. and preference will be given to mathematicians whose research interests are close to those of our regular faculty members. Senior Visiting Positions may be for a semester or one year period. A complete dossier should be received by **December 15, 2008**. Early applications are encouraged since the department will start the review process in October, 2008. Applicants should send the completed "AMS Application Cover Sheet," a vita, a summary statement of research and teaching experience, and arrange to have letters of recommendation sent to: Faculty Hiring, Department of Mathematics, Texas A&M University, College Station, Texas 77843-3368. Further information can be obtained from: http://www.math.tamu.edu/hiring. Texas A&M University is an equal opportunity employer. The University is dedicated to the goal of building a culturally diverse and pluralistic faculty and staff committed to teaching and working in a multicultural environment and strongly encourages applications from women, minorities, individuals with disabilities, and veterans. The University is responsive to the needs of dual career couples.

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TEXAS A&M UNIVERSITY — IAMCS-KAUST Postdoctoral Fellowships — The Institute for Applied Mathematics and Computational Science (IAMCS) at Texas A&M University is pleased to invite applications for its IAMCS-KAUST Postdoctoral Fellowships. IAMCS is an interdisciplinary research institute at Texas A&M University recently named as one of the four inaugural King Abdullah University of Science and Technology (KAUST) Global Research Partner Centers. Its core members number more than two dozen faculty from the fields of Mathematics, Statistics, Computer Science and Engineering. Fostering collaboration and interdisciplinary research anchored in the mathematical sciences are at the heart of IAMCS's mission. To that end, IAMCS emphasizes among its activities annual research themes. Its first two annual themes are Computational Earth Science and Computational Material Science and Engineering. IAMCS Postdoctoral candidates should have demonstrated interest and involvement in interdisciplinary research, and successful candidates will be encouraged to participate in the annual theme activities and to establish research collaborations exploring theme year topics. Moreover, each fellow will be invited to establish collaborations with KAUST faculty, postdocs and students as well as all of the KAUST Global Research Partner institutions and individual investigators. This offers an unprecedented opportunity for postdoctoral fellows to join a remarkable network of leading research institutions and eminent scholars assembled through the KAUST GRP program. KAUST is a new graduate research university being rapidly developed by the Kingdom of Saudi Arabia at a site along the Red Sea a short distance north of Jeddah. When it opens in September 2009, it will offer world class, state-of-the-art research and instructional facilities supporting its core research and graduate programs in earth sciences, materials science and engineering, biosciences, and applied mathematics and computational science. A key element in KAUST's development as a premier graduate research university is its Global Research Partnership (GRP) program. The GRP consists of its Academic Excellence Alliance Partners, Research Center Partners and Individual Research Scholar Partners. The IAMCS-KAUST Postdoctoral Fellowships at Texas A&M University are two year appointments with the possibility of extension to a third year. The fellowship stipend is $50K over 12 months plus fringe benefits. Interested individuals should submit their application materials (CV, research statement and three letters of recommendation) to the email address KAUST@tamu.edu by ***15 December 2008***. IAMCS intends to select up to four IAMCS-KAUST Fellows. Texas A&M University is an equal opportunity employer. The University is dedicated to the goal of building a culturally diverse pluralistic faculty and staff committed to teaching and working in a multicultural environment and strongly encourages applications from women, minorities and individuals with disabilities.

UNIVERSITY OF CALIFORNIA AT BERKELEY — Tenured or Tenure Track Positions — Pending budget approval, we invite applications for two positions effective July 1, 2009, at either the tenure-track (assistant professor) or tenured (associate or full professor) level, in pure or applied mathematics. Tenure-track applicants are expected to have demonstrated outstanding research potential, normally including major contributions beyond the doctoral dissertation. Such applicants are requested to submit an application on-line via http://www.mathjobs.org and the application should contain the AMS cover sheet, a resume, a list of publications, and a research statement. Applicants should ask three people to submit letters of evaluation through mathjobs.org. It is the responsibility of the tenure-track applicants to make sure that letters of evaluation are sent. All letters of evaluation are subject to Berkeley campus policies on confidentiality of letters of evaluation, a summary of which can be found at http://math.berkeley.edu/employment_academic.html. Tenure applicants are expected to demonstrate leadership in research. They are requested to apply on-line via http://mathjobs.org and to submit the AMS cover sheet, a curriculum vitae, a list of publications, and the names and addresses of three references. Applicants should indicate whether they are applying for an associate professor or a full professor position. The department will assume responsibility to solicit letters of evaluation and will provide evaluators with a copy of the summary of policies on confidentiality of letters of evaluation. Non-electronic applications for tenure-track and tenure positions can be sent to the Vice Chair for Faculty Affairs at the above address. They should contain the materials specified above. Applications for both tenure-track and tenure applications must be submitted on mathjobs.org or postmarked by ***December 1, 2008***. Applications submitted or postmarked after the deadline will not be considered. The University of California is an Equal Opportunity, Affirmative Action Employer.

UNIVERSITY OF CALIFORNIA AT BERKELEY — Charles B. Morrey Jr. Assistant Professorships — We invite applications for these special (non-tenure-track) positions effective July 1, 2009. The terms of these appointments may range from two to three years. Applicants should have a recent Ph.D.'s, or the equivalent, in an area of pure or applied mathematics. The applications must be submitted online via http://www.mathjobs.org and should include the AMS Cover Sheet and supporting documentation (cover letter, resume, publication list, research statement, and possibly a teaching statement). Applicants should ask three people to submit letters of evaluations via mathjobs.org. All letters of evaluation are subject to Berkeley campus policies on confidentiality of letters of evaluation, a summary of which can be found at http://math.berkeley.edu/employment_academic.html. Applications must be submitted by **December 1, 2008**. Applications submitted after the deadline will not be considered. The University of California is an Equal Opportunity, Affirmative Action Employer.

UNIVERSITY OF CALIFORNIA AT BERKELEY — Temporary Postdoctoral Positions — Several temporary positions beginning in Fall 2009 are anticipated for new and recent Ph.D.'s in pure or applied mathematics. The terms of these appointments may range from one to three years. Applicants for NSF or other postdoctoral fellowships are encouraged to apply for these positions. Mathematicians whose research interests are close to those of regular department members will be given some preference. The applications must be submitted online via http://www.mathjobs.org and should include the AMS Cover Sheet and supporting documentation (cover letter, resume, publication list, research statement, and possibly a teaching statement). Applicants should ask three people to submit letters of evaluations via mathjobs.org. All letters of evaluation are subject to Berkeley campus policies on confidentiality of letters of evaluation, a summary of which can be found at http://math.berkeley.edu/employment_academic.html. Applications must be submitted by **December 1, 2008**. Applications submitted after the deadline will not be considered. The University of California is an Equal Opportunity, Affirmative Action Employer.

UNIVERSITY OF CALIFORNIA, DAVIS — Positions in Mathematics — The Department of Mathematics at the University of California, Davis, is soliciting applications for a tenure-track assistant professor position starting July 1, 2009. The department has identified the following priority areas: Geometry and Probability, but outstanding candidates in all areas of mathematics may be considered. Minimum qualifications for these positions include a Ph.D. degree or its equivalent in the Mathematical Sciences and great promise in research and teaching. Duties include mathematical research, undergraduate and graduate teaching, and departmental and university service. Additional information about the Department may be found at http://math.ucdavis.edu/. Our postal address is Department of Mathematics, University of California, One Shields Avenue, Davis, CA 95616-8633. Applications will be accepted until the position is filled. To guarantee full consideration, the application should be received by **November 30, 2008**. To apply: submit the AMS Cover Sheet and supporting documentation electronically through http://www.mathjobs.org/. UC Davis is an affirmative action/equal employment opportunity employer and is dedicated to recruiting a diverse faculty community. We welcome all qualified applicants to apply, including women, minorities, individuals with disabilities and veterans.

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UNIVERSITY OF CALIFORNIA, DAVIS — Post-Doc Positions in Mathematics — The Department of Mathematics at the University of California, Davis, is soliciting applications for a few post-doctoral positions starting July 1, 2009. The areas of specialization are open. To be considered for the Arthur J. Krener Assistant Professor position, the Department seeks applicants with excellent research potential in areas of faculty interest and effective teaching skills. Applicants are required to have completed their Ph.D. by the time of their appointment, but no earlier than July 1, 2005. The annual salary of this position is $52,350. The teaching load is three quarter-long courses. Arthur J. Krener appointments are renewable for a total of up to three years, assuming satisfactory performance in research and teaching. Applicants for the VIGRE Fellow position must be US citizens, nationals, or permanent residents and have received their Ph.D. no earlier than January 1, 2008. Applicants in all research areas are encouraged to apply. The current annual salary for VIGRE Fellows is $59,456. The teaching load is three quarter-long courses. VIGRE Fellow appointments are renewable for a total of up to three years, assuming satisfactory performance in research and teaching. Additional information about the Department may be found at http://math.ucdavis.edu/. Our postal address is Department of Mathematics, University of California, One Shields Avenue, Davis, CA 95616-8633. Applications will be accepted until the positions are filled. To guarantee full consideration, the application should be received by **November 30, 2008**. To apply: submit the AMS Cover Sheet and supporting documentation electronically through http://www.mathjobs.org/.UC Davis is an affirmative action/equal employment opportunity employer and is dedicated to recruiting a diverse faculty community. We welcome all qualified applicants to apply, including women, minorities, individuals with disabilities and veterans.

UNIVERSITY OF CALIFORNIA, LOS ANGELES — Faculty Positions Academic Year 2009-2010 — The Department of Mathematics, subject to administrative approval, expects to make several tenure-track/tenure appointments in a wide range of possible fields. We also plan to make temporary and visiting appointments in the following categories 2-5. Depending on the level, candidates must give evidence of potential or demonstrated distinction in scholarship and teaching. (1) Tenure Track/Tenured Faculty Positions. Salary is commensurate with level of experience. (2) E.R. Hedrick Assistant Professorships. Salary is $61,200 and appointments are for three years. The teaching load is four-quarter courses per year. (3) Computational and Applied Mathematics (CAM) Assistant Professorships. Salary is $61,200, and appointments are for three years. The teaching load is normally reduced to two or three quarter courses per year by research funding as available. (4) Program in Computing (PIC) Assistant Adjunct Professorships. Salary is $65,500. Applicants for these positions must show ery strong promise in teaching and research in an area related to computing. The teaching load is four one-quarter programming courses each year and one seminar every two years. Initial appointments are for one year and possibly longer, up to a maximum service of four years. (5) Assistant Adjunct Professorships and Research Postdocs. Normally appointments are for one year, with the possibility of renewal. Strong research and teaching background required. The salary range is $53,200-$59,500. The teaching load for Adjuncts is six-quarter courses per year. If you wish to be considered for any of these positions you must submit an application and supporting documentation electronically via www.mathjobs.org. For fullest consideration, all application materials should must be submitted on or before, **December 12, 2008**. **Ph.D is required for all positions.* UCLA and the Department of Mathematics have a strong commitment to the achievement of excellence in teaching and research and diversity among its faculty and staff. The University of California is an Equal Opportunity/Affirmative Action Employer. The University of California asks that applicants complete the Equal Opportunity Employer survey for, Letters and Science, at the following URL: http://cis.ucla.edu/facultysurvey. Under Federal law, the University of California may employ only individuals who are legally authorized to work in the United States as established by providing documents specified in the Immigration Reform and Control Act of 1986.

UNIVERSITY OF LOUISVILLE — Three Tenure-track Positions at the Assistant Professor level — The Department of Mathematics at the University of Louisville anticipates filling three tenure-track positions at the Assistant Professor level beginning Fall 2009. Preference will be given to applicants in applied or computational areas of Algebra, Combinatorics and Probability, but qualified applicants in other areas strengthening the department's PhD program in applied and industrial mathematics and complementing existing strengths, will be considered. The Department currently has 26 tenured/tenure track faculty members and the typical teaching load is two courses per semester. The minimum qualifications for these positions include a Ph.D. degree, or its equivalent, in the Mathematical Sciences. Applicants with demonstrated strengths in research and teaching are encouraged to apply. The expectations include that the successful applicant will contribute fully to research and both undergraduate and graduate instruction. Review of applications will begin **December 12, 2008**. Applicants must apply on-line at www.louisville.edu/jobs: for the Algebra position use Job ID # 23107; for the Combinatorics position use Job ID # 23126, and for the Probability position use Job ID # 23127; only your CV must be submitted electronically. In addition, the following items need to be mailed in hardcopy to the address below: (1) cover letter with the job ID number, summary of research and of teaching interests; (2) the AMS Standard Coversheet; and (3) a hard copy of your curriculum vitae. Please indicate whether you are going to attend the AMS Annual Joint Meeting in Washington, DC in your cover letter. Also, please arrange to have at least three letters of recommendation which discuss at length your research and teaching qualifications, sent to: Search Committee Department of Mathematics University of Louisville Louisville, KY 40292. The University of Louisville is an Affirmative Action, Equal Opportunity, Americans with Disabilities Employer, committed to diversity and in that spirit, seeks applications from a broad variety of candidates. For more information about the position or institution please see: http://www.math.louisville.edu.

UNIVERSITY OF NOTRE DAME — Robert Lumpkins Instructorship in Mathematics and Notre Dame Instructorship in Mathematics – The Department of Mathematics of the University of Notre Dame invites applications from recent doctorates for the positions of 1), Robert Lumpkins Instructor in Mathematics, 2), Notre Dame Instructor in Mathematics. Candidates in any specialty compatible with the research interests of the department will be considered. The teaching load and salary will be competitive with those of distinguished instructorships at other AMS Group I universities. This position is for a term of three years beginning August 22, 2009; it is not renewable and is not tenure track. Applications, including a curriculum vitae and a completed AMS standard cover sheet, should be filed through MathJobs (www.MathJobs.org). Applicants should also arrange for at least three letters of recommendation to be submitted through the MathJobs system. These letters should address the applicant's research accomplishments and supply evidence that the applicant has the ability to communicate articulately and teach effectively. Notre Dame is an equal opportunity employer, and we particularly welcome applications from women and minority candidates. The evaluation of candidates will begin **December 1, 2008**. Information about the department is available at http://math.nd.edu

UNIVERSITY OF OREGON — Full-time Tenure-related Positions at the rank of Assistant Professor — The University of Oregon department of mathematics seeks applicants for full-time tenure-related positions at the rank of Assistant Professor, in any area of pure or applied mathematics. Minimum qualifications are a PhD in mathematics or closely related field. An outstanding research record, and active participation and excellence in teaching at the undergraduate and graduate levels will be the most important criteria for selection. Please see http://hr.uoregon.edu/jobs/ for a full position announcement. Applicants will please provide a standard AMS cover page, CV and three letters of recommendation. We strongly prefer applications and letters to be submitted electronically at MathJobs.org. Application materials may also be **mailed directly to: Search Committee, Department of Mathematics, 1222 University of Oregon, Eugene, Oregon, 97403-1222. Deadline for application:** December 13, 2008. Candidates should have the ability to work effectively with a diverse community. The University of Oregon is an EO/AA/ADA institution committed to cultural diversity.

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UNIVERSITY OF OREGON — Tenure-related Position in the Area of Probability — The University of Oregon department of mathematics seeks applicants for a full-time tenure-related position in the area of probability at the rank of Assistant Professor. Minimum qualifications are a PhD in mathematics or closely related field. An outstanding research record, and active participation and excellence in teaching at the undergraduate and graduate levels will be the most important criteria for selection. Applicants will please provide a standard AMS cover page, CV and three letters of recommendation. We strongly prefer applications and letters to be submitted electronically at MathJobs.org. Application materials may also be mailed directly to: Search Committee, Department of Mathematics, 1222 University of Oregon, Eugene, Oregon, 97403-1222. Deadline for applications: **December 13, 2008**. Candidates should have the ability to work effectively with a diverse community. The University of Oregon is an EO/AA/ADA institution committed to cultural diversity.

UNIVERSITY OF PENNSYLVANIA — Nontenure-Track Junior Positions – Several positions will be available beginning July 1, 2009. Candidates should have strong research credentials and be recognized as potentially successful teachers of undergraduate and graduate students. Applications should be submitted online through www.mathjobs.org. For further information, please contact personnel@math.upenn.edu or Personnel Committee, Department of Mathematics, University of Pennsylvania, Philadelphia, PA 19104-6395. The University of Pennsylvania is an equal opportunity, affirmative action employer. Women and minority candidates are encouraged to apply.

UNIVERSITY OF PITTSBURGH — Scientific Computing/Numerical Analysis — The Mathematics Department of the University of Pittsburgh invites applications for a tenure-track or tenured position in Scientific Computing/Numerical Analysis to begin in the Fall Term 2009, pending budgetary approval. The appointment is at the Assistant Professor or the Associate Professor level, depending on the credentials of the applicant. A Ph.D. in Mathematical Sciences is required. We seek excellence in teaching and research so applicants should demonstrate substantial research accomplishment and dedication to teaching. Submit a vita, three letters of recommendation, a research statement and evidence of teaching accomplishments electronically through http://www.mathjobs.org. If the candidate is unable to submit electronically, materials may be sent to: Search Committee in Scientific Computing/Numerical Analysis, Department of Mathematics, University of Pittsburgh, Pittsburgh, PA 15260. Review of completed files will begin on **November 30, 2008** and continue until the position is filled. The University of Pittsburgh is an Affirmative Action, Equal Opportunity Employer. Women and members of minority groups under-represented in academia are especially encouraged to apply.

UNIVERSITY OF PITTSBURGH — Representation Theory/Algebraic Geometry/Number Theory/Combinatorics — The Mathematics Department of the University of Pittsburgh invites applications for two tenure-track or tenured positions in Representation Theory/Algebraic Geometry/Number Theory/Combinatorics to begin in the Fall Term 2009, pending budgetary approval. The appointments are at the Assistant Professor level or above, depending on the credentials of the applicant. A Ph.D. in Mathematical Sciences is required. We seek excellence in teaching and research so applicants should demonstrate substantial research accomplishment and dedication to teaching. Send a vita, three letters of recommendation, a research statement and evidence of teaching accomplishments electronically through http://www.mathjobs.org. If the candidate is unable to submit electronically, materials may be sent to: Search Committee in Algebra, Department of Mathematics, University of Pittsburgh, Pittsburgh, PA 15260. Review of completed files will begin on **November 30, 2008** and continue until the position is filled. The University of Pittsburgh is an Affirmative Action, Equal Opportunity Employer. Women and members of minority groups under-represented in academia are especially encouraged to apply.

UNIVERSITY OF PITTSBURGH — Topology/Geometry — The Mathematics Department of the University of Pittsburgh invites applications for a tenure-track position in Topology/Geometry to begin in the Fall Term 2009, pending budgetary approval. The appointment is at the Assistant Professor level. A Ph.D. in Mathematical Sciences is required. We seek excellence in teaching and research so applicants should demonstrate substantial research accomplishment and dedication to teaching. Submit a vita, three letters of recommendation, a research statement and evidence of teaching accomplishments electronically through http://www.mathjobs.org. If the candidate is unable to submit electronically, materials may be sent to: Search Committee in Topology/Geometry, Department of Mathematics, University of Pittsburgh, Pittsburgh, PA 15260. Review of completed files will begin on **November 30, 2008** and continue until the position is filled. The University of Pittsburgh is an Affirmative Action, Equal Opportunity Employer. Women and members of minority groups under-represented in academia are especially encouraged to apply.

UNIVERSITY OF PITTSBURGH — Non-Tenure Stream Positions in Mathematics — The Mathematics Department of the University of Pittsburgh invites applications for two non-tenure stream positions to begin in the Fall Term 2009, pending budgetary approval. A Ph.D. in Mathematical Sciences is preferred and at least a Masters degree in Mathematical Sciences is required. The appointments are at the Assistant Instructor level or above, depending on the credentials of the applicant. We seek excellence in teaching and potential for collaboration in the research activities of the department. Send a vita, three letters of recommendation, and a teaching portfolio including a statement of teaching philosophy, sample course syllabi and assignments, and evaluations of teaching by students or supervisors, electronically through http://www.mathjobs.org. If the candidate is unable to submit electronically, materials may b**e sent to: NTS Search Committee, Department of Mathematics, University of Pittsburgh, Pittsburgh, PA 15260. Review of completed files will begin on** December 15, 2008 and continue until the position is filled. The University of Pittsburgh is an Affirmative Action, Equal Opportunity Employer. Women and members of minority groups under-represented in academia are especially encouraged to apply.

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UNIVERSITY OF TEXAS AT AUSTIN — Expected openings for Fall include: (a) Instructorships, some that have R.H. Bing Faculty Fellowships attached to them, and (b) possibly two or more positions at the tenure-track/tenure level. (a) Instructorships at The University of Texas at Austin are postdoctoral appointments, renewable for two additional years. It is assumed that applicants for Instructorships will have completed all Ph.D. requirements by August 17, 2009. Other factors being equal, preference will be given to those whose doctorates were conferred in 2008 or 2009. Candidates should show superior research ability and have a strong commitment to teaching. Consideration will be given only to persons whose research interests have some overlap with those of the permanent faculty. Duties consist of teaching undergraduate or graduate courses and conducting independent research. The projected salary is $44,000 for the nine-month academic year. Each R.H. Bing Fellow holds an Instructorship in the Mathematics Department, with a teaching load of two courses in one semester and one course in the other. The combined Instructorship-Fellowship stipend for nine-months is $52,000, which is supplemented by a travel allowance of $1,000. Pending satisfactory performance of teaching duties, the Fellowship can be renewed for two additional years. Applicants must show outstanding promise in research. Bing Fellowship applicants will automatically be considered for other departmental openings at the postdoctoral level, so a separate application for such a position is unnecessary. Those wishing to apply for Instructor positions are asked to send a vita and a brief research summary to the above address c/o Instructor Committee. Transmission of the preceding items via the internet (URL: https://www.ma.utexas.edu/jobs/application) is encouraged. (b) An applicant for a tenure-track or tenured position must present a record of exceptional achievement in her or his research area and must demonstrate a proficiency at teaching. In addition to the duties indicated above for Instructors, such an appointment will typically entail the supervision of Ph.D. students. The salary will be commensurate with the level at which the position is filled and the qualifications of the person who fills it. Those wishing to apply for tenure-track/tenured positions are asked to send a vita and a brief research summary to the above address, c/o Recruiting Committee. Transmission of the preceding items via the internet (URL: https://www.ma.utexas.edu/jobs/application/TenureTrack) is encouraged. All applications should be supported by four or more letters of recommendation, at least one of which speaks to the applicant's teaching credentials. The screening of applications will begin on **December 1, 2008**. Background check will be conducted on the applicant selected. The University of Texas at Austin is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF UTAH — Various Positions — The Department of Mathematics at the University of Utah invites applications for the following positions: Full-time tenure-track or tenured appointments at the level of assistant, associate, or full professor in all areas of mathematics. Special consideration will be given to candidates in the area of statistics. Three-year Scott, Wylie, Burgess, and VIGRE Assistant Professorships, including Dual VIGRE Post Doctoral positions, depending on funding availability. Three-year Post Doctoral positions with the NSF-NIGMS grant on the Formation and Function of Physiological Gels. Please see our website at www.math.utah.edu/positions for information regarding available positions, application requirements and deadlines. Applications must be completed through the website www.mathjobs.org. The University of Utah is an Equal Opportunity, Affirmative Action Employer and encourages applications from women and minorities, and provides reasonable accommodation to the known disabilities of applicants and employees. The University of Utah values candidates who have experience working in settings with students from diverse backgrounds, and possess a strong commitment to improving access to higher education for historically underrepresented students.

VIRGINIA COMMONWEALTH UNIVERSITY — Assistant or Associate Professor of Mathematics — Applications are invited for up to two tenure-eligible faculty position (9-month) as Assistant or Associate Professor of Mathematics in the Dept. of Mathematics and Applied Mathematics, commencing in August 2009, subject to the availability of funding. Either a Ph.D. in Mathematics or Applied Mathematics or a Ph.D. in Mathematics Education and a Master's degree in Mathematics is required at the time of the appointment. Preference will be given to candidates with expertise in algebra and linear algebra, analysis and numerical analysis, graph theory and combinatorics, mathematical applications to medicine and the biological sciences, dynamical systems, and math education. A job description and application information can be found at: http://www.math.vcu.edu/open_positions/. The Department's Web page is: http://www.math.vcu.edu/, and the University's Web page is: http://www.vcu.edu. Virginia Commonwealth University is an equal opportunity/affirmative action employer. Women, minorities and persons with disabilities are encouraged to apply.

WAKE FOREST UNIVERSITY — Two Tenure Track Positions — Applications are invited for two tenure track positions in mathematics at the assistant professor level beginning August 2009. We seek highly qualified candidates who have a commitment to excellence in both teaching and research. A Ph.D. in mathematics or a related area is required. Candidates with research interests in Number Theory, Combinatorics, or Algebra will receive first consideration. The department has 20 members and offers both a B.A. and a B.S. in mathematics, with an optional concentration in statistics, and a B.S. in each of mathematical business and mathematical economics. The department has a graduate program offering an M.A. in mathematics. A complete application will include a letter of application, curriculum vitae, teaching statement, research statement, graduate transcripts and three letters of recommendation. Applicants are encouraged to post materials electronically at http://www.mathjobs.org. Hard copy can be sent to Stephen Robinson, Wake Forest University, Department of Mathematics, P.O. Box 7388, Winston-Salem, NC 27109. (sbr@wfu.edu, http://www.math.wfu.edu) AA/EO employer.

WILLIAMS COLLEGE — Tenure Track Position in Mathematics — The Williams College Department of Mathematics and Statistics invites applications for one tenure track position in mathematics, beginning fall 2009, at the rank of assistant professor (in an exceptional case, a more advanced appointment may be considered). We are seeking a highly qualified candidate who has demonstrated excellence in teaching and research, and who will have a Ph.D. by the time of appointment. Williams College is a private, coeducational, residential, highly selective liberal arts college with an undergraduate enrollment of approximately 2,000 students. The teaching load is two courses per 12-week semester and a winter term course every other January. In addition to excellence in teaching, an active and successful research program is expected. Applicants are asked to supply a vita and have three letters of recommendation on teaching and research sent. Teaching and research statements are also welcome. Applications may be made on-line (http://www.mathjobs.org/jobs). Alternately, application materials and letters of recommendations may be sent to Olga R. Beaver, Chair of the Hiring Committee, Department of Mathematics and Statistics, Williams College, Williamstown, MA 01267. Evaluation of applications will begin on or after November 15 and will continue until the position is filled. For more information on the Department of Mathematics and Statistics, please visit http://www.williams.edu/Mathematics. Williams College is committed to building and supporting a diverse population of faculty, staff and students, to fostering a varied and inclusive curriculum, and to providing a welcoming intellectual environment for all. As an EEO/AA employer, Williams encourages applications from all backgrounds. To learn more about Williams College, please visit http://www.williams.edu.

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