Mathematics People

2012 Gödel Prize Awarded

Three groups of researchers have been awarded the 2012 Gödel Prize of the Association for Computing Machinery's (ACM) Special Interest Group on Algorithms and Computation Theory (SIGACT), together with the European Association for Theoretical Computer Science (EATCS). ELIAS KOUTSOUPIAS of the University of Athens and CHRISTOS H. PAPADIMITRIOU of the University of California Berkeley; TIM ROUGHGARDEN of Stanford University and ÉVA TARDOS of Cornell University; and NOAM NISAN of the Hebrew University of Jerusalem and AMIR RONEN of IBM Research in Haifa, Israel, were honored "for their contributions to understanding how selfish behavior by users and service providers impacts the behavior of the Internet and other complex computational systems." The prize citation reads in part:

"In their paper 'Worst-case Equilibria', Koutsoupias and Papadimitriou introduced the 'price of anarchy' concept, a measure of the extent to which competition approximates cooperation. It quantifies how much behavior is lost due to selfish behaviors on the Internet, which operates without a system designer or monitor striving to achieve the 'social optimum'. Their research examines how much performance is lost due to these selfish behaviors by Internet users and service providers who act in their own interest. Their answer, surprisingly often, is 'not that much'.

"Roughgarden and Tardos revealed the power and depth of the 'price of anarchy' concept as it applies to routing traffic in large-scale communications networks to optimize the performance of a congested network. Their paper 'How bad is selfish routing?' revisits an old conundrum in transportation science known as 'Braess's paradox' and provides remarkably complete results on the relationship between centralized optimization and selfish routing in network traffic.

"Nisan and Ronen coined the term 'algorithmic mechanism design' in their paper of the same title, presenting a whole new range of applications of the theory of mechanism design within computer science. Combining ideas from economics and game theory with concepts and techniques from computer science, they enriched both mechanism design and the theories of algorithms and complexity."

The Gödel Prize includes an award of US$5,000 and is named in honor of Kurt Gödel, who was born in Austria-Hungary (now the Czech Republic) in 1906. Gödel's work has had immense impact on scientific and philosophical thinking in the twentieth century. The award recognizes his major contributions to mathematical logic and the foundations of computer science.

—From an ACM announcement

Hodgson Receives Wright Award

BERNARD HODGSON of the University of Laval has been named the recipient of the 2012 Graham Wright Award for Distinguished Service by the Canadian Mathematical Society (CMS). The award recognizes individuals who have made sustained and significant contributions to the Canadian mathematical community and in particular to the CMS. Hodgson has been involved with the Canadian Mathematics Education Study Group, helping to increase collaboration between education specialists and mathematicians. Within the CMS he has served as vice president, as a member of the education committee, and as a member of the board of directors.

—From a CMS announcement

Mathematical Sciences Awards at ISEF

The 2012 Intel International Science and Engineering Fair (ISEF) was held May 13-18, 2012, at the David L. Lawrence Convention Center in Pittsburgh, Pennsylvania. This year more than 1,500 students in grades nine through twelve from about seventy countries, regions, and territories participated in the fair. The Society for Science and the Public, in partnership with the Intel Foundation, selects a Best in Category contestant, who receives a cash award of US$5,000. The student chosen this year in the Mathematical Sciences category was AISHWARYA A. VARDHANA, seventeen, of Jesuit High School, Portland, Oregon, for a

project titled "Small geometric progressions modulo N for deterministic polynomial selection". Vardhana also received a First Award, which carries a cash prize of US$3,000. In addition, a grant of US$1,000 was given to Jesuit High School. Other award winners and the titles of their projects follow.

First Award: Fabian Henneke, nineteen, Xianghui Zhong, eighteen, and Danial Sanusi, nineteen, all from Kippenberg-Gymnasium, Bremen, Germany, "(Almost) unit-distance points in the polychromatic plane: Colorings of the n-dimensional space".

Second Award (US$1,500): Katherine Leigh Cordwell, sixteen, Manzano High School, Albuquerque, New Mexico, "Completing graphs"; Madhurima Das, fifteen, Plymouth High School, Canton, Michigan, "Fractal dimension analysis to predict cancer"; Sidharth Dhawan, eighteen, Westview High School, Portland, Oregon, "Complexity of interlocking polyominoes".

Third Award (US$1,000): Markus Robert Woltjer, seventeen, Wilsonville High School, Wilsonville, Oregon, "Graph theory and locality sensitive hashing for DICOM image analysis"; Anirudh Prabhu, seventeen, West Lafayette Junior/Senior High School, West Lafayette, Indiana, "A unitary group relaxation of the traveling salesman problem and its applications"; Junda Huang, seventeen, James Madison High School, Brooklyn, New York, "A relationship between quadratic character and repeating decimals"; Pratheek Nagaraj, eighteen, Marjory Stoneman Douglas High School, Parkland, Florida, "Novel optimized Runge-Kutta methods to increase computational accuracy in numerical integration of differential equations"; Jonah Milton Kallenbach, seventeen, Germantown Academy, Fort Washington, Pennsylvania, "Novel graph theory algorithms for protein structure prediction and design".

—*From an ISEF announcement*

AMS Menger Awards at the 2012 ISEF

The 2012 Intel International Science and Engineering Fair (ISEF) was held May 13–18, 2012, at the David L. Lawrence Convention Center in Pittsburgh, Pennsylvania. This year more than 1,500 students in grades nine through twelve from about seventy countries, regions, and territories participated in the world's largest pre-college science research competition, which was first organized in 1950 and has included international participants since 1958. Student finalists who compete at the ISEF go through a multistep process to qualify and have won an all-expense-paid trip to the fair. They qualify by winning local, regional, and state fairs in the United States or national science fairs abroad. In addition to numerous grand awards presented by the ISEF, more than eighty federal agencies, professional and educational organizations, including the American Mathematical Society (AMS), participated by giving special awards. Prizes given by the AMS included cash, certificates, AMS tote bags, and a booklet about Karl Menger given to each award winner.
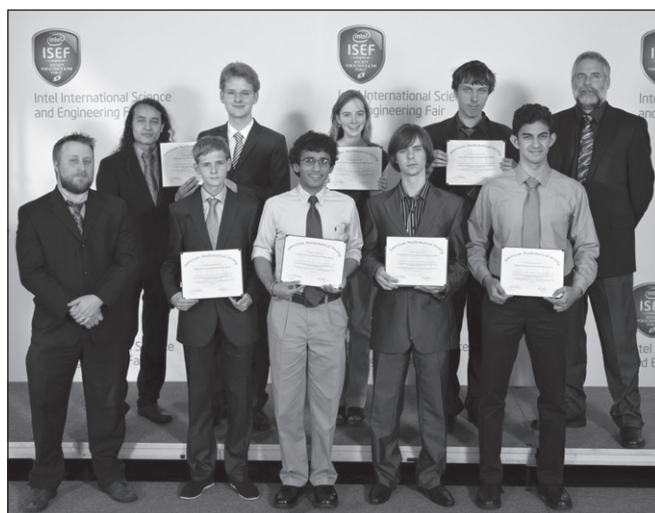
AMS Menger Awards. Back row (l-r): Danial Sanusi, Fabian Henneke, Katherine Cordwell, Viachaslau Murshka, Greg Fasshauer (committee chair). Front row (l-r): Andrew Annis (AMS), Danila Baygushev, Anirudh Prabhu, Raman Birulia, Sidharth Dhawan.

For the AMS this was the twenty-fourth year of participation, and it was the twenty-second year of the presentation of the Karl Menger Awards. The members of the 2012 AMS Menger Prize Committee and AMS Special Awards Judges were Greg Fasshauer, Illinois Institute of Technology (chair); Moon Duchin, Tufts University; and Jonathan King, University of Florida. The panel of judges initially reviewed all fifty-seven projects in mathematics, as well as a number of mathematically oriented projects in computer science, physics, and engineering. From these entries they selected a subset of students who were interviewed for further consideration for a Menger Prize. The AMS gave awards to one first-place winner, two second-place winners, four third-place winners, and honorable mentions to five others.

The Karl Menger Memorial Prize winners for 2012 (listed alphabetically in each category) are as follows:

First-Place Award (US$1,000): Fabian Henneke, Danial Sanusi, and Xianghui Zhong, Kippenberg-Gymnasium, Bremen, Germany, "(Almost) Unit-Distance Points in the Polychromatic Plane: Colorings of the N-Dimensional Space".

Second-Place Awards (US$500): Raman A. Birulia, School No. 41, Minsk, Belarus, "The Probability of Generating the Symmetric Group with a Commutator Condition"; Katherine Leigh Cordwell, Manzano High School, Albuquerque, New Mexico, "Completing Graphs".

Third-Place Awards (US$250): Danila Alexandrovich Baygushev, Lyceum "Vtoraia shkola", Moscow, Russia, "(C, B, A)-Permutations, Their Young Diagrams and Arnold Discrete Dynamic Systems"; Sidharth Dhawan, Westview High School, Portland, Oregon, "Complexity of Interlocking Polyominoes"; Viachaslau I. Murashka, Gymnasium No. 71, Gomel, Belarus, "Partially Conjugate-Permutable Subgroups and Their Applications"; Anirudh Prabhu, West Lafayette Junior/Senior High School, West Lafayette,

Indiana, "A Unitary Group Relaxation of the Traveling Salesman Problem and Its Applications".

Honorable Mention Awards: RASHAD ABDULLA, West Shore Junior/Senior High School, Melbourne, Florida, "On the Fine Classification of Periodic Orbits of Continuous Endomorphisms on the Real Line with Application in Chaos Theory"; FREDERIK BENZING, Landesgymnasium für Hochbegabte, Schwäbisch Gmünd, Germany, "Continued Fractions and e"; MARK ALAN HOLMSTROM and THERESA MCLAUGHLIN, Live Oak High School and Ann Sobrato High School, Morgan Hill, California, "Neighbors with Prescribed Prime Factors"; YOUKOW HOMMA and LYNDON JI, Carmel High School, Carmel, Indiana, "Counting Zeros of Rational Harmonic Functions: Parameter Spaces"; ANITA KUMMAM-URI RAO, Glenda Dawson High School, Pearland, Texas, "Lorenz & Modular Flows are Knot Similar".

Forty-one individual students and sixteen 2- or 3- member teams from fifteen different countries competed in the mathematics category, with fifty-two of the participants being male and twenty-three female. As indicated by the titles of the award-winning projects listed above, the student research covered a wide range of topics. The panel of judges was impressed by the quality, breadth and originality of the work, and the dedication and enthusiasm of the students. Many of the projects contained original research one would usually expect to see only from graduate students. For the first time in recent history the Menger Award judges selected a team of students (Fabian Henneke, Danial Sanusi, and Xianghui Zhong) as recipients of the First Prize Award. Two more teams received Honorable Mention Awards. Anirudh Prabhu (Third-Place Award) was the only 2012 winner who was able to repeat his success from 2011. This year's youngest winner was Danila Alexandrovich Baygushev (fourteen, Third-Place Award).

In an effort to promote the outreach activities of the AMS, a number of this year's contestants were interviewed by Greg Fasshauer. These short videos, produced by Andrew Annis (AMS), can be viewed at `http://www.youtube.com/amermathsoc`.

The Society for Science and the Public (`http://www.societyforscience.org/`), a nonprofit organization based in Washington, DC, owns and has administered the ISEF since 1950. Intel became the title sponsor of ISEF in 1996. The Intel ISEF is the premiere science competition in the world and annually provides a forum for more than 1,500 high school students from more than seventy countries, regions, and territories. The 2013 Intel ISEF finals will be held May 12–17 in Phoenix, Arizona.

The AMS's participation in the Intel-ISEF is supported in part by income from the Karl Menger Fund, which was established by the family of the late Karl Menger. The income from the donation by the Menger family covers less than the amount of the awards. The balance, including the travel expenses of the judges, comes from the AMS's general fund. For more information about this program or to make contributions to this fund, contact the AMS Development Office, 201 Charles Street, Providence, RI 02904-2294; or send email to `development@ams.org;` or phone 401-455-4103.

Greg Fasshauer, Professor of Applied Mathematics, Illinois Institute of Technology

Mathematics Opportunities

AMS Travel Grants for MCA 2013, August 5–9, 2013, in Guanajuato, Mexico

The American Mathematical Society has applied to the National Science Foundation (NSF) for funds to permit partial travel support for up to sixty U.S. mathematicians attending the inaugural meeting of the Mathematics Congress of the Americas (MCA) that will take place August 5–9, 2013, in Guanajuato, Mexico. Subject to the award decision by the NSF, the Society is preparing to administer the selection process.

Instructions on how to apply for support are available on the AMS website at `http://www.ams.org/programs/travel-grants/mca`. The application period will be September 15–October 31, 2012. This travel grants program, if funded, will be administered by the Membership and Programs Department, AMS, 201 Charles Street, Providence, RI 02904-2294. For questions or more information, contact Steven Ferrucci at `sxf@ams.org`, 800-321-4267, ext. 4113, or 401-455-4113.

This program is open to U.S. mathematicians (those who are affiliated with a U.S. institution, and applicants must be affiliated with a U.S. institution at the time of travel). It is expected that this travel grant program will provide travel support for both U.S.-based invited speakers (senior mathematicians) and early-career mathematicians. Early-career mathematicians (those within six years of their doctorate), women, and members of U.S. groups underrepresented in mathematics are especially encouraged to apply. Invited speakers from U.S. institutions to MCA 2013 should submit applications if funding is desired.

Applications will be evaluated by a panel of mathematical scientists under the terms of a proposal submitted to the National Science Foundation (NSF) by the Society.

Should the proposal to the NSF be funded, the following conditions will apply: mathematicians accepting grants for partial support of the travel to MCA 2013 may not supplement them with any other NSF funds. Currently, it is the intention of the NSF's Division of Mathematical Sciences to provide no additional funds on its other regular research grants for travel to MCA in 2013. However, an individual mathematician who does not receive a travel grant may use regular NSF grant funds, subject to the usual restrictions and prior approval requirements.

All information currently available about the MCA 2013 program, organization, and registration procedure is located on the MCA 2013 website: `http://www.mca2013.org/`.

American Mathematical Society Centennial Fellowships

Invitation for Applications for Awards for 2013–2014 Deadline December 1, 2012

Description: The AMS Centennial Research Fellowship Program makes awards annually to outstanding mathematicians to help further their careers in research. The number of fellowships to be awarded is small and depends on the amount of money contributed to the program. The Society supplements contributions as needed. One fellowship will be awarded for the 2013–2014 academic year. A list of previous fellowship winners can be found at `http://www.ams.org/profession/prizes-awards/ams-awards/centennial-fellow`.

Eligibility: The eligibility rules are as follows. The primary selection criterion for the Centennial Fellowship is the excellence of the candidate's research. Preference will be given to candidates who have not had extensive fellowship support in the past. Recipients may not hold the Centennial Fellowship concurrently with another research fellowship such as a Sloan or NSF Postdoctoral Fellowship. Under normal circumstances, the fellowship cannot be deferred. A recipient of the fellowship shall have held his or her doctoral degree for at least three years and not more than twelve years at the inception of the award (that is, received between September 1, 2001, and September 1, 2010). Applications will be accepted from those currently holding a tenured, tenure-track, postdoctoral, or comparable (at the discretion of the selection committee) position at an institution in North America. Applications should include a cogent plan indicating how the fellowship will be used. The plan should include travel to at least one other institution and should demonstrate that the fellowship will be used for more than reduction of teaching at the candidate's home institution. The selection committee will consider the plan in addition to the quality of the candidate's research and will try to award the fellowship to those for whom the award would make a real difference in the development of their research careers.

Work in all areas of mathematics, including interdisciplinary work, is eligible.

Deadline: The deadline for receipt of applications is **December 1, 2012**. The award recipient will be announced in February 2013 or earlier if possible.

Application information: Find Centennial information and the application form via the Internet at `http://www.ams.org/ams-fellowships/`. For paper copies of the form, write to the Membership and Programs Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294; `prof-serv@ams.org`; 401-455-4105.

—AMS announcement

Call for Nominations for Clay Research Fellowships

The Clay Mathematics Institute (CMI) invites nominations for its competition for the 2013 Clay Research Fellowships. Fellows are selected for their research achievements and their potential to become leaders in research mathematics. All are recent Ph.D.'s, and most are selected as they complete their thesis work. Most recent appointees were finishing graduate students at the time of their selection, though other mathematicians under age thirty occasionally have been appointed. Terms range from one to five years, with most given in the upper range of this interval. The primary selection criteria for the Fellowship are the exceptional quality of the candidate's research and the candidate's promise to become a mathematical leader. Selection decisions are made by the Scientific Advisory Board. Nominations should be submitted by October 30, 2012, and should include a letter of nomination, names and contact information for two other references, curriculum vitae, and list of publications. Nominations should be sent to to the attention of Nick Woodhouse, Office of the President, Clay Mathematics Institute, 24-29 St. Giles, Oxford OX1 3LB, U.K. Electronic nominations are also accepted at `nwoodh@maths.ox.ac.uk`, copied to Naomi Kraker at `kraker@maths.ox.ac.uk`.

Current and alumni Clay Research Fellows are Mohammed Abouzaid, Spyros Alexakis, Timothy Austin, Artur Avila, Roman Bezrukavnikov, Manjul Bhargava, Daniel Biss, Alexei Borodin, Maria Chudnovsky, Ivan Corwin, Dennis Gaitsgory, Soren Galatius, Daniel Gottesman, Ben Green, Sergei Gukov, Adrian Ioana, Bo'az Klartag, Elon Lindenstrauss, Ciprian Manolescu, Davesh Maulik, Maryam Mirzakhani, Sophie Morel, Mircea Mustata, Sam Payne, Igor Rodnianski, Sucharit Sarkar, Peter Scholze, David Speyer, Terence Tao, Jack Thorne, András Vasy, Akshay Venkatesh, Teruyoshi Yoshida, and Xinyi Yuan.

—Clay Mathematics Institute announcement

AWM Travel Grants for Women

The National Science Foundation (NSF) and the Association for Women in Mathematics (AWM) sponsor travel grant programs for women mathematicians.

AWM Travel Grants for Women Researchers enable women to attend research conferences in their fields, thereby providing scholars valuable opportunities to advance their research activities and their visibility in the research community. A Mathematics Travel Grant provides full or partial support for travel and subsistence for a meeting or conference in the grantee's field of specialization, awarding funds of up to US$1,500 for domestic travel and US$2,000 for foreign travel.

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. The grants provide up to US$1,500 for domestic travel and US$2,000 for foreign travel

AWM Mathematics Mentoring Travel Grants are designed to help junior women develop long-term working and mentoring relationships with senior mathematicians. A mentoring travel grant funds travel, subsistence, and other expenses for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month. Up to seven grants will be awarded in amounts up to US$5,000 each. Mathematics Education Research Mentoring Travel Grants encourage collaboration between mathematicians and researchers in education and related fields in order to improve the education of teachers and students. Women mathematicians who wish to collaborate with an educational researcher or to learn about educational research may use the mentoring grants to travel to collaborate with or be mentored by a mathematics education researcher. Up to seven grants will be awarded in amounts up to $5,000 each.

The final deadline for the Travel Grants program for 2012 is **October 1, 2012**. The deadlines for 2013 are **February 1, 2013**; **May 1, 2013**; and **October 1, 2013**. For the Mathematics Education Research Travel Grant program, the deadlines are **October 1, 2012**; **February 1, 2013**; **May 1, 2013**; **and October 1, 2013**. For the Mathematics Mentoring Travel Grants program, the deadline is **February 1, 2013**. For the Mathematics Education Research Mentoring Travel Grants program, the deadline is **February 1, 2013**. For further information and details on applying, see the website `https://sites.google.com/site/awmmath/programs/travel-grants`, telephone: 703-934-0163, email: `awm@awm-math.org`; or contact Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030.

—From an AWM announcement

News from the CIRM

The Centro Internazionale per la Ricerca Matematica (CIRM), Trento, Italy, announces the continuation and expansion of its activities in the field of mathematics research in collaboration with the Department of Mathematics of the University of Trento. Following are the planned activities.

Conferences: Proposals for conferences must contain (1) a scientific proposal, with names of tentative speakers; (2) a detailed financial budget, of which up to 50 percent will be supported by the CIRM; (3) specification of the other available or planned financial resources. Applications for the year 2013 should be sent before **September 15, 2012**, by mail to Fondazione Bruno Kessler (FBK), Centro Internazionale per la Ricerca Matematica, Via Sommarive n. 14-Povo, 38123 Trento, Italy, or via electronic mail to the address `micheletti@fbk.eu`.

Postdoctoral Fellowships: One annual postdoctoral position is available for a researcher in mathematics for the year 2012–2013 to study at the CIRM. The fellowship offers support in the amount of 23,500 euros (approximately US$29,000) per year. The deadline for applications is **September 15, 2012**. Applications may be sent to the preceding postal or email addresses. For more information see the website `http://cirm.fbk.eu/en/node/134`.

Visiting Positions and Research in Pairs: The CIRM is seeking applications for visiting professor and visiting scholar positions, as well as for the Research in Pairs program. Applications for these two programs must be sent by mail or email to the aforementioned addresses. They can be submitted at any time and must contain a specific indication of the proposed dates for the visit; it would be well to send applications at least three months before the planned stay. For further information please visit the websites `http://cirm.fbk.eu/en/Visiting+Professors` and `http://cirm.fbk.eu/en/node/122`.

—Marco Andreatta
Director, CIRM

AIM Workshops

The American Institute of Mathematics (AIM) seeks proposals for workshops in all areas of the mathematical sciences. Proposals should include (1) a plan for the workshop, including a description of the workshop focus and goals; (2) a list of at least two and at most four organizers; (3) a list of potential participants; and (4) the mathematics subject classification and a list of references. Workshops generally last four or five days and can support up to twenty-eight participants.

Proposals for workshops may be submitted online at `www.aimath.org`; the deadline for submissions is **November 1, 2012**. The AIM workshop format is designed to encourage new collaborations to make plans or progress toward a research goal: there are two talks each morning of the workshop and structured group activities each afternoon, including research in small groups.

Further details and a list of upcoming workshops are available at www.aimath.org.

—From an AIM announcement

PIMS Conferences and Fellowships

The Pacific Institute for the Mathematical Sciences (PIMS) is currently welcoming applications for support of conferences, workshops, summer schools, distinguished visitors, special focus periods, collaborative research groups, and related activities in the mathematical sciences, to occur after April 1, 2013. Proposals must be received by **October 1, 2012**. Please note that PIMS is a participant in "Mathematics of Planet Earth 2013", and proposals for activities that are aligned with that theme are welcomed. For further information and application instructions, see the website http://www.pims.math.ca/scientific/call-proposals.

PIMS invites nominations of outstanding young researchers in the mathematical sciences for postdoctoral fellowships for the year 2013–2014. Candidates must be nominated by at least one scientist or by a department (or departments) affiliated with PIMS. The fellowships are intended to supplement support provided by the sponsor and are tenable at any of its Canadian member universities: Simon Fraser University, the University of Alberta, the University of British Columbia, the University of Calgary, the University of Lethbridge, the University of Victoria, the University of Regina, and the University of Saskatchewan, as well as at the PIMS affiliate the University of Northern British Columbia.

For the 2013–2014 competition, to be held in January of 2013, the amount of the award will be at least C$20,000 (approximately US$19,400) and the sponsor(s) is (are) required to provide additional funds to finance a minimum total stipend of C$40,000 (approximately US$38,800). Rankings of candidates are made by the PIMS PDF Review Panel based on the qualifications of the candidate, his or her potential for participation in PIMS programs, and his or her potential involvement with PIMS partners. PIMS postdoctoral fellows will be expected to participate in all PIMS activities related to the fellow's area of expertise and will be encouraged to spend time at more than one site. To ensure that PIMS postdoctoral fellows are able to participate fully in institute activities, they may not teach more than two single-term courses per year.

Nominees must have a Ph.D. or equivalent (or expect to receive a Ph.D. by December 31, 2013) and be within three years of the Ph.D. at the time of the nomination (i.e., the candidate must have received her or his Ph.D. on or after January 1, 2010). The fellowship may be taken up at any time between September 1, 2013, and January 1, 2014. The fellowship is for one year and is renewable for at most one additional year.

The PIMS PDF nomination/application process takes place entirely online, utilizing the MathJobs service provided by the American Mathematical Society. Having selected their nominees, sponsors direct them to apply online at mathjobs.org/jobs/PIMS. Nominees are required to upload two letters of reference, a curriculum vitae, and a statement of research interests. Sponsors must upload their own reference letters (these are in addition to the two reference letters mentioned above) and a statement of financial support. They will receive instructions as to how to proceed from their nominees via email from MathJobs. Detailed instructions regarding all aspects of the MathJobs application procedure may be found in the online MathJobs user guides. Please note that application is by nomination only; unsolicited applications will not be considered. Please note that all nominees must apply through MathJobs; this includes nominees from PIMS Collaborative Research Groups.

Complete applications must be uploaded to MathJobs by **December 1, 2012**. For further information, visit the website http://www.pims.math.ca/scientific/postdoctoral or contact: assistant.director@pims.math.ca.

—PIMS announcement