

torsion (Carey and Mathai, 1992) or  $L_2$ -analytic torsion (Lott, 1992; Mathai, 1992), which can be seen in hindsight to have been influenced by Breuer's work.

In parallel with Breuer's investigations but completely independently, the theory of operator ideals in semifinite vNAs was developed. Both lines of research coalesced in the late 1990s in the study of semifinite noncommutative geometry; this, in turn, led to renewed interest in Breuer's work. The impetus for extending Connes's framework in the context of semifinite vNAs was only partly due to the influence of Atiyah's  $L_2$ -index theorem, since in Connes and Cuntz (1988), it had been demonstrated that the study of cyclic cohomology leads naturally to semifinite Fredholm modules. The systematic study of semifinite noncommutative geometry was begun only in 1998 in Carey and Phillips (1998) and in connection with foliation theory (*à la* Connes) in Benameur and Fack (2006). The motivation for Carey and Phillips (1998) was provided by Phillips's general theory of the analytic spectral flow (Phillips, 1997), which depends on the Breuer index. Breuer's approach was indeed surprisingly prescient because, with only minor modifications, it can be adapted to the situation of the local index formula in semifinite noncommutative geometry even though a complete account had to wait until 2006 (Carey, Phillips, Rennie, and Sukochev, 2006).

In his Marburg period Breuer's research interests gradually reduced to a few questions. His later years were focused on the proof of one of Kaplansky's conjectures, which says that  $AW^*$ -factors are in fact  $W^*$ -factors.

Breuer's attempts at employing homotopy theoretical arguments to prove the existence of a trace in  $AW^*$ -factors, unfortunately, did not succeed. But his interest in new developments in mathematics did not fade away; they were studied in lectures and seminars well beyond the date of his retirement. With similar energy he tried to perfect his astonishing knowledge of cultural history, with special emphasis on its French sector.

Those who met Manfred Breuer in person will remember him as a penetrating and farsighted researcher, as a helpful and inspiring teacher, and as a gracious and self-effacing human being.

A pdf file of this obituary with a complete bibliography can be found at <http://www.math.hu-berlin.de/~bruening/documents/ObituaryManfredBreuer.pdf>.

—Jochen Brüning  
Humboldt-Universität  
[bruening@mathematik.hu-berlin.de](mailto:bruening@mathematik.hu-berlin.de)

—Alan Carey  
Australian National University  
[Alan.Carey@anu.edu.au](mailto:Alan.Carey@anu.edu.au)

—Matthias Lesch  
Universität Bonn  
[Lesch@math.uni-bonn.de](mailto:Lesch@math.uni-bonn.de)

# Mathematics Opportunities

## Math for America Fellowships

Math for America (MfA) is a nonprofit organization with a mission to improve mathematics education in U.S. public secondary schools by recruiting, training, and retaining outstanding mathematics teachers and leaders. MfA offers fellowships for new and experienced teachers and school leaders. The MfA Master Teacher Fellowship is a four-year program that rewards outstanding experienced public secondary school mathematics and science teachers. Master Teacher Fellowships are available in Berkeley, Boston, New York City, and Washington, DC; the application deadline for these fellowships is **May 6, 2013**.

The Math for America Early Career Fellowship is awarded to public secondary school mathematics teachers early in their careers. MfA Early Career Fellows exhibit outstanding potential, a dedication to professional development, and an interest in collaboration with the Math for America community. The program provides professional support and growth opportunities for new teachers. The MfA Early Career Fellowship requires a commitment of four years. Applications are being accepted for the Early

Career Fellowship in New York City. The deadline is **May 6, 2013**. For more information and to apply, see <http://www.mathforamerica.org/web/guest/apply>.

—From an MfA announcement

## NSF Postdoctoral Research Fellowships

The National Science Foundation (NSF) awards Mathematical Sciences Postdoctoral Research Fellowships (MSPRF) for appropriate research in areas of the mathematical sciences, including applications to other disciplines. Awardees are permitted to choose research environments that will have maximal impact on their future scientific development. Awards are made in the form of either Research Fellowships or Research Instructorships. The Research Fellowship option provides full-time support for any eighteen academic-year months in a three-year period, in intervals not shorter than three consecutive months. The Research Instructorship option provides either two

## Mathematics Opportunities

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academic years of full-time support or one academic year of full-time and two academic years of half-time support. Under both options, the award includes six summer months; however, no more than two summer months of support may be received in any calendar year. Under both options, the stipend support for twenty-four months (eighteen academic-year months plus six summer months) will be provided within a forty-eight-month period.

The deadline for proposals is **October 16, 2013**. See <http://www.nsf.gov/pubs/2012/nsf12496/nsf12496.htm>.

*—From an NSF announcement*

## Call for Nominations for 2014 Clifford Prize

The W. K. Clifford Prize is an international scientific prize for young researchers for excellence in theoretical and applied Clifford algebras, their analysis, and geometry. The award consists of a written certificate, one year of online access to the Clifford algebra-related journals, a book token worth 150 euros (approximately US\$200) and a cash award of 1,000 euros (approximately US\$1,300). The prizewinner also has the opportunity to give the special W. K. Clifford Prize Lecture at University College London, where W. K. Clifford held the first Goldsmid Chair from 1871 until his untimely death in 1879.

The prize will be awarded at the Tenth Conference on Clifford Algebras and Their Applications in Mathematical Physics (ICCA10) at Tartu (Estonia) in 2014. The deadline for nominations is **September 30, 2013**. Nominations should be sent to [secretary@wkcliffordprize.org](mailto:secretary@wkcliffordprize.org). See <http://www.wkcliffordprize.org>.

*—Fred Brackx,  
Secretary*

## Mentoring through Critical Transition Points in the Mathematical Sciences

The National Science Foundation (NSF) Mentoring through Critical Transition Points in the Mathematical Sciences (MCTP) program provides funds for the training of U.S. students and postdoctoral researchers in the mathematical sciences. Proposals are solicited from departments of the mathematical sciences to support projects that aim to improve training at critical transition points in the educational careers of students and junior researchers. MCTP awards are intended to support training programs that have strong potential to increase the number of well-prepared U.S. citizens, nationals, and permanent residents who pursue careers in the mathematical sciences and in other NSF-supported disciplines. The deadline for full proposals is **June 4, 2013**. For more information

see <http://www.nsf.gov/pubs/2011/nsf11542/nsf11542.htm>.

*—From an NSF announcement*

## Research Training Groups in the Mathematical Sciences

The National Science Foundation (NSF) Research Training Groups in the Mathematical Sciences (RTG) program provides funds for the training of U.S. students and postdoctoral researchers in the mathematical sciences. Proposals are solicited from groups of researchers based in a subarea of the mathematical sciences or linked by a multidisciplinary theme to support training at educational levels from undergraduate to postdoctoral within that focus. RTG awards are intended to support training programs that have strong potential to increase the number of well-prepared U.S. citizens, nationals, and permanent residents who pursue careers in the mathematical sciences and in other NSF-supported disciplines. The deadline for full proposals is **June 4, 2013**. For more information see <http://www.nsf.gov/pubs/2011/nsf11540/nsf11540.htm>.

*—From an NSF announcement*

## International Mathematics Competition for University Students

The Twentieth International Mathematics Competition (IMC) for University Students will be held August 6–12, 2013, at American University in Blagoevgrad, Bulgaria. Participating universities are invited to send several students and one teacher; individual students are welcome. Students completing their first, second, third, or fourth years of university education are eligible. The competition will consist of two sessions of five hours each. Problems will come from the fields of algebra, analysis (real and complex), geometry, and combinatorics. The working language will be English. See the website <http://www.imc-math.org.uk/> or contact John Jayne, University College London, Gower Street, London WC1E 6BT, United Kingdom; telephone: +44 (0)77 40304010; email: [j.jayne@ucl.ac.uk](mailto:j.jayne@ucl.ac.uk).

*—John Jayne,  
University College London*

## News from the Bernoulli Center

The Bernoulli Center (CIB), funded jointly by the Swiss National Science Foundation and the Swiss Federal Institute of Technology in Lausanne, began its activity in March

2002. Its mission is to support research in mathematics and its applications, to organize and host thematic programs, to provide a supportive and stimulating environment for researchers, and to launch and foster collaborations between mathematicians working in different areas, as well as mathematicians and other scientists. The CIB regularly launches calls for proposals of one-semester programs. For more details, see <http://cib.epfl.ch/>.

The Bernoulli Center is hosting a Special Semester Program from July 1 to December 23, 2013, devoted to semiclassical analysis and integrable systems. The program aims to bring together specialists in algebraic aspects of the theory of classical and quantum completely integrable systems with experts in semiclassical analysis, as well as geometric and topological aspects of the theory of completely integrable systems. There is a summer school and also a conference being organized in July. The program directors are Vladimir Fock (Strasbourg), Álvaro Pelayo

(IAS Princeton and Washington University), Nicolai Reshetikhin (UC Berkeley), and San Vũ Ngoc (Rennes). Details are available at <http://integrablesystems.epfl.ch/> by clicking on "Key Events".

In addition, a special event will take place during the program: a week-long conference in honor of Alan Weinstein, on the occasion of his seventieth birthday, during the week of July 22–26, 2013. This conference will be a forum to celebrate Alan Weinstein's fundamental contributions to mathematics and to thank him for many years of mentorship. The conference is organized by Henrique Bursztyn (IMPA), Rui Loja Fernandes (Urbana-Champaign), Álvaro Pelayo (IAS Princeton and Washington University), and Tudor Ratiu (EPFL). For further information see <http://integrablesystems.epfl.ch/w-conference.php>.

—*Bernoulli Center announcement*

## Inside the AMS

### AMS Holds Workshop for Department Chairs

The AMS held its annual workshop for department chairs on January 8, 2013, prior to the Joint Mathematics Meetings in San Diego, California. This one-day session focused on a number of issues facing departments today, including how to prepare the next generation of college mathematics teachers; remedial mathematics courses for undergraduate students; preparing a workforce competent in science, technology, engineering, and mathematics (STEM); and the teaching of college-level mathematics courses. The meeting is designed in a workshop format to stimulate discussion and allow the sharing of ideas and experiences among attending department chairs, which allows attendees to address departmental challenges from new perspectives.

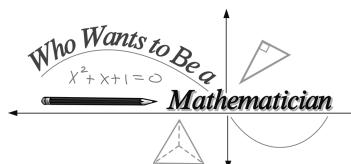
The workshop was led by Timothy Hodges, University of Cincinnati; Helen Roberts, Montclair State University; Alex Smith, University of Wisconsin-Eau Claire; and Michel Smith, Auburn University.

—Anita Benjamin  
AMS Washington Office

### From the AMS Public Awareness Office

#### Who Wants to Be a Mathematician on Pi Day

The AMS conducted Who Wants to Be a Mathematician at Providence College on Pi Day (March 14, 2013). See highlights of the event, which has been held in Rhode Island



for a lucky thirteen straight years, at [www.ams.org/programs/students/wwtbam/pi-day-2013](http://www.ams.org/programs/students/wwtbam/pi-day-2013).

—Annette Emerson and Mike Breen

### Epsilon Awards for 2013

The AMS Epsilon Fund for Young Scholars was established in 1999 to provide financial assistance to summer programs in the United States and Canada for mathematically talented high school students. These programs have provided mathematically talented youngsters with their first serious mathematical experiences. The name for the fund was chosen in remembrance of the late Paul Erdős, who was fond of calling children "epsilons".

The AMS has chosen sixteen summer mathematics programs to receive Epsilon grants for activities in the summer of 2013. The grants will support program expenses and student scholarships and, in some cases, scholarships only. The programs were chosen on the basis of mathematical excellence and enthusiasm. Award amounts were governed by the varying financial needs of each program.

The 2013 grants are awarded to: All Girls/All Math, University of Nebraska; Camp Euclid, online; Canada/USA Mathcamp, University of Puget Sound, Tacoma, Washington; Hampshire College Summer Studies in Mathematics