For Your Information

News from PIMS

The Pacific Institute for the Mathematical Sciences (PIMS) is pleased to announce that Alejandro Adem has been appointed the new director of PIMS. He will commence his five-year term on July 1, 2008.

Presently the PIMS deputy director, Adem is a professor of mathematics at the University of British Columbia in Vancouver, Canada, and holds the Canada Research Chair in Algebraic Topology. He received his B.Sc. in 1982 from the National University of Mexico and his Ph.D. from Princeton University in 1986. After holding a Szegö Assistant Professorship at Stanford University and spending a year at the Institute for Advanced Study in Princeton, he joined the faculty of the University of Wisconsin-Madison in 1990, where he remained until 2004. Adem has held visiting positions at the Eidgenössisches Technische Hochscule (ETH)-Zurich, the Max Planck Institute in Bonn, the University of Paris VII and XIII, and Princeton University.

Adem's mathematical interests span a variety of topics in algebraic topology, group cohomology, and related areas. He has authored and coauthored numerous research articles as well as two highly regarded monographs, *Cohomology of Finite Groups* and *Orbifolds and Stringy Topology*. He has given over two hundred invited talks on his research throughout the world and has supervised several Ph.D. students and postdoctoral fellows. He was awarded the U.S. National Science Foundation Young Investigator Award in 1992, a Romnes Faculty Fellowship in 1995, and a Vilas Associate Award in 2003. He has extensive editorial experience and is currently an editor for the *Memoirs of the AMS* and *Transactions of the AMS*.

Adem brings extensive administrative experience to PIMS. He served as chair of the Department of Mathematics at the University of Wisconsin-Madison during the period 1999–2002, and since 2005 he has been the deputy director at PIMS. Adem's credentials as a scientific organizer include serving for four years as cochair of the Scientific Advisory Committee at the Mathematical Sciences Research Institute at Berkeley (MSRI) and as a member of MSRI's Board of Trustees. Since 2005 he has been a member of the Scientific Advisory Board for the Banff International Research Station (BIRS).

Adem brings a wealth of experience in organizing international collaborations connecting Canadian mathematical scientists with colleagues abroad. This includes his leadership in organizing the first joint meeting between the Canadian and Mexican mathematical societies in 2006, as well as his crucial role in the development of the Pacific Rim Mathematical Association (PRIMA). He will continue to build on PIMS's outstanding record of mathematical collaboration between academic, industrial, and international partners.

Further information about PIMS is available on the Web at `http://www.pims.math.ca`.

—From a PIMS announcement

STIX Fonts Project Completes Design Phase

The AMS is one of a group of six scientific publishers that have collaborated to produce the Scientific and Technical Information Exchange (STIX) fonts. In October 2007 the group announced the release of the fonts in a beta test version. This free, comprehensive set of special characters, mainly mathematical or scientific, represents a significant breakthrough in scientific, technical, and medical publishing. The final production release of the STIX fonts was set to occur before the end of 2007.

The successful completion of the STIX fonts project will alleviate the need for publishers to assemble symbols from a variety of fonts. When posted to a website, documents using the STIX fonts will be properly rendered regardless of the fonts installed on a particular computer, saving editors' valuable time.

In addition to the AMS, the other publishers that collaborated to design, fund, and manage the STIX project are the American Chemical Society (ACS), the American

Institute of Physics (AIP), the American Physical Society (APS), Elsevier, and the Institute of Electrical and Electronics Engineers (IEEE).

The technical development of the STIX Fonts Project was handled by MicroPress, Inc., a respected font designer, which has created and delivered nearly 8,000 characters/glyphs required for these comprehensive fonts. Glyphs designed by Elsevier for an earlier project push the final glyph total to 8,047.

"If you've ever had to assemble scientific symbols from a variety of fonts, many of which vary in character style, positioning, or size, you'll immediately appreciate the benefits of STIX fonts," said Robert Kelly, director, Journal Information Systems, the American Physical Society. "Aside from the fact that the STIX fonts work with a wide variety of Web browsers, word processors, and other scholarly communications software, they have the ability to support widely expanded character sets and layout features which provide richer linguistic support and advanced typographic control. We hope that all operating system and application vendors move quickly to support the fonts."

By making the fonts freely available, the STIX project hopes to encourage the development of widespread applications that make use of these fonts. In particular, the STIX project will create a TEX implementation that TEX users can install and configure with minimal effort. The TEX version of the fonts is being developed by a subcontractor and should be available soon after the production version is released. For more information, visit the STIX fonts website at `http://www.stixfonts.org`.

—From a STIX news release

Program for ICM2010, Hyderabad

The next International Congress of Mathematicians (ICM) will be held in Hyderabad, India, August 19–27, 2010. The Program Committee has, based on the scientific programs of former ICMs and suggestions from mathematicians the world over, decided on the structure of the scientific program of ICM 2010.

Below is the list of sections, their descriptions, and the distribution of lectures to the sections. The program committee will finalize the descriptions in the spring of 2008 and invites comments on the section descriptions from the adhering organizations and mathematicians interested in helping make the ICM 2010 program as attractive as possible.

Proposals for changes may be submitted to Hendrik Lenstra, chair of the ICM 2010 Program Committee, `hwlicm@math.leidenuniv.nl`, by the end of January 2008.

Total number of lectures (including panel discussions): 150–176.

1. **Logic and foundations** (4–5 lectures). Model theory. Set theory. Recursion theory. Proof theory. Applications.

2. **Algebra** (6–7 lectures). Groups and their representations (except as specified in 5 and 7). Rings, algebras and modules (except as specified in 7). Algebraic K-theory. Category theory. Computational algebra and applications.

3. **Number theory** (10–12 lectures). Analytic and algebraic number theory. Local and global fields and their Galois groups. Zeta and L-functions. Diophantine equations. Arithmetic on algebraic varieties. Diophantine approximation, transcendental number theory and geometry of numbers. Modular and automorphic forms, modular curves and Shimura varieties. Langlands program. p-adic analysis. Number theory and physics. Computational number theory and applications, notably to cryptography.

4. **Algebraic and complex geometry** (9–11 lectures). Algebraic varieties, their cycles, cohomologies and motives (including positive characteristics). Schemes. Commutative algebra. Low-dimensional varieties. Singularities and classification. Birational geometry. Moduli spaces. Abelian varieties and p-divisible groups. Derived categories. Transcendental methods, topology of algebraic varieties. Complex differential geometry, Kahler manifolds and Hodge theory. Relations with mathematical physics and representation theory. Real algebraic and analytic sets. Rigid and p-adic analytic spaces. Tropical geometry.

5. **Geometry** (10–12 lectures). Local and global differential geometry. Geometric PDE and geometric flows. Geometric structures on manifolds. Riemannian and metric geometry. Geometric aspects of group theory. Convex geometry. Discrete geometry. Geometric rigidity.

6. **Topology** (10–12 lectures). Algebraic, differential and geometric topology. Floer and gauge theories. Low-dimensional including knot theory and connections with Kleinian groups and Teichmüller theory. Symplectic and contact manifolds. Topological quantum field theories.

7. **Lie theory and generalizations** (8–10 lectures). Algebraic and arithmetic groups. Structure, geometry and representations of Lie groups and Lie algebras. Related geometric and algebraic objects, e.g., symmetric spaces, buildings, vertex operator algebras, quantum groups. Noncommutative harmonic analysis. Geometric methods in representation theory. Discrete subgroups of Lie groups. Lie groups and dynamics, including applications to number theory.

8. **Analysis** (7–8 lectures). Classical analysis. Special functions. Harmonic analysis. Complex analysis in one and several variables, potential theory, geometric function theory (including quasi-conformal mappings), geometric measure theory. Applications.

9. **Functional analysis and applications** (5–6 lectures). Operator algebras. Noncommutative geometry, spectra of random matrices. K-theory of C*-algebras, structure of factors and their automorphism groups, operator-algebraic aspects of quantum field theory, linear and nonlinear functional analysis, geometry of Banach spaces, asymptotic geometric analysis. Connections to ergodic theory.

10. **Dynamical systems and ordinary differential equations** (9–11 lectures). Topological and symbolic dynamics. Geometric and qualitative theory of ODE and smooth dynamical systems, bifurcations and singularities. Hamiltonian systems and dynamical systems

of geometric origin. One-dimensional and holomorphic dynamics. Multidimensional actions and rigidity in dynamics. Ergodic theory, including applications to combinatorics and combinatorial number theory.

11. **Partial differential equations** (9–10 lectures). Solvability, regularity, stability and other qualitative properties of linear and nonlinear equations and systems. Asymptotics. Spectral theory, scattering, inverse problems. Variational methods and calculus of variations. Optimal transportation. Homogenization and multiscale problems. Relations to continuous media and control. Modeling through PDEs.

12. **Mathematical physics** (10–12 lectures). Quantum mechanics. Quantum field theory. General relativity. Statistical mechanics and random media. Integrable systems. Electromagnetism, string theory, condensed matter, fluid dynamics, multifield physics (e.g., fluid/waves, fluid/solids, etc.).

13. **Probability and statistics** (12–13 lectures). Classical probability theory, limit theorems and large deviations. Combinatorial probability. Random walks. Interacting particle systems. Stochastic networks. Stochastic geometry. Stochastic analysis. Random fields. Random matrices and free probability. Statistical inference. High-dimensional data analysis. Sequential methods. Spatial statistics. Applications.

14. **Combinatorics** (7–8 lectures). Combinatorial structures. Enumeration: exact and asymptotic. Graph theory. Probabilistic and extremal combinatorics. Designs and finite geometries. Relations with linear algebra, representation theory and commutative algebra. Topological and analytical techniques in combinatorics. Combinatorial geometry. Combinatorial number theory. Polyhedral combinatorics and combinatorial optimization.

15. **Mathematical aspects of computer science** (6–7 lectures). Complexity theory and design and analysis of algorithms. Formal languages. Computational learning. Algorithmic game theory. Cryptography. Coding theory. Semantics and verification of programs. Symbolic computation. Quantum computing. Computational geometry, computer vision.

16. **Numerical analysis and scientific computing** (5–6 lectures). Design of numerical algorithms and analysis of their accuracy, stability, and complexity. Approximation theory. Applied and computational aspects of harmonic analysis. Numerical solution of algebraic, functional, differential, and integral equations. Grid generation and adaptivity.

17. **Control theory and optimization** (6–7 lectures). Minimization problems. Controllability, observability, stability. Robotics. Stochastic systems and control. Optimal control. Optimal design, shape design. Linear, nonlinear, integer, and stochastic programming. Applications.

18. **Mathematics in science and technology** (8–10 lectures). Mathematics applied to the physical sciences, engineering sciences, life sciences, social and economic sciences, and technology. Bioinformatics. Mathematics in interdisciplinary research. The interplay of mathematical modeling, mathematical analysis and scientific computation, and its impact on the understanding of scientific phenomena and on the solution of real-life problems.

19. **Mathematics education and popularization of mathematics** (3 lectures + 3 panel discussions). All aspects of mathematics education, from elementary school to higher education. Mathematical literacy and popularization of mathematics. Ethnomathematics.

20. **History of mathematics** (3 lectures). Historical studies of all of the mathematical sciences in all periods and cultural settings.

—Martin Grötschel, Secretary, International Mathematical Union