Invited One-Hour Plenary Lectures

Jean-Michel Bismut: Local Index Theory and Higher Analytic Torsion ..... I 143

Christopher Deninger: Some Analogies Between Number Theory and Dynamical Systems on Foliated Spaces ..... I 163

Persi Diaconis: From Shuffling Cards to Walking Around the Building: An Introduction to Modern Markov Chain Theory ..... I 187

Giovanni Gallavotti: Chaotic Hypothesis and Universal Large Deviations Properties ..... I 205

Wolfgang Hackbusch: From Classical Numerical Mathematics to Scientific Computing ..... I 235

Helmut H. W. Hofer: Dynamics, Topology, and Holomorphic Curves ..... I 255

Ehud Hrushovski: Geometric Model Theory ..... I 281

I. G. Macdonald: Constant Term Identities, Orthogonal Polynomials, and Affine Hecke Algebras ..... I 303

Stéphane Mallat: Applied Mathematics Meets Signal Processing .. I 319

Dusa McDuff: Fibrations in Symplectic Topology ..... I 339

Tetsuji Miwa: Solvable Lattice Models and Representation Theory of Quantum Affine Algebras ..... I 359

Jürgen Moser: Dynamical Systems – Past and Present ..... I 381

George Papanicolaou: Mathematical Problems in Geophysical Wave Propagation ..... I 403

Gilles Pisier: Operator Spaces and Similarity Problems ..... I 429

Peter Sarnak: L-Functions ..... I 453

Peter W. Shor: Quantum Computing ..... I 467

Karl Sigmund: The Population Dynamics of Conflict and Cooperation ..... I 487

Michel Talagrand: Huge Random Structures and Mean Field Models for Spin Glasses ..... I 507

Cumrun Vafa: Geometric Physics ..... I 537

Marcelo Viana: Dynamics: A Probabilistic and Geometric Perspective ..... I 557

Vladimir Voevodsky: $\mathbf{A}^1$-Homotopy Theory ..... I 579