

Contents

Preface	v
Contents	xi
Past congresses	xv
Organization of the congress	xvii
9ECM committees	xxv
Prize winners	xxxi
Program of the congress	xxxiii
Sponsors and exhibitors	xlix
Opening ceremony	li

Plenary lectures

Chasing finite shadows of infinite groups through geometry	1
<i>by Martin R. Bridson</i>	
Generalized Riemann–Hilbert correspondence, wall-crossing and resurgence .	45
<i>by Maxim Kontsevich</i>	
Restricted subgraphs of edge-colored graphs and applications	73
<i>by Benny Sudakov</i>	
Large-scale behavior of out-of-equilibrium systems at and above the critical dimension	103
<i>by Giuseppe Cannizzaro and Fabio Toninelli</i>	
Anomalous diffusion via iterative quantitative homogenization: An overview of the main ideas	125
<i>by Scott Armstrong and Vlad Vicol</i>	
Positivity and non-commutativity	169
<i>by Anna Wienhard</i>	
Sign patterns of the Liouville function	203
<i>by Tamar Ziegler</i>	

Invited lectures

A discontinuous Galerkin method for the three-dimensional heterodimer model with application to prion-like proteins' dynamics	217
<i>by Paola F. Antonietti, Mattia Corti, and Giacomo Lorenzon</i>	
Dualities in convex geometric analysis and beyond	241
<i>by Shiri Artstein-Avidan</i>	
The continuum problem: Hilbert's first problem revisited	259
<i>by David Asperó and Ralf Schindler</i>	
Self-affine sets and measures – A survey	277
<i>by Balázs Bárány</i>	
Applications of the renormalisation group	303
<i>by Roland Bauerschmidt</i>	
A free boundary approach of spectral optimization problems: Extremal Neumann eigenvalues	317
<i>by Dorin Bucur</i>	
Courant, Bézout and persistence	333
<i>by Lev Buhovsky</i>	
Unstable vortices and non-uniqueness for 2D Euler and α -gSQG	351
<i>by Ángel Castro</i>	
Graph product structure: Theory and applications	377
<i>by Vida Dujmović and David R. Wood</i>	
Weak mixing in polygonal billiards	389
<i>by Giovanni Forni</i>	
Partition regularity of homogeneous quadratics: Current trends and challenges	411
<i>by Nikos Frantzikinakis</i>	
Symmetries of Grothendieck rings in representation theory	467
<i>by David Hernandez</i>	
Forward and inverse problems in nonlinear acoustics	489
<i>by Barbara Kaltenbacher</i>	

Introduction to inverse problems for non-linear partial differential equations . . . <i>by Matti Lassas</i>	515
Cheeger–Müller and Bismut–Zhang theorem on singular spaces <i>by Ursula Ludwig</i>	541
Strong convergence of unitary and permutation representations of discrete groups <i>by Michael Magee</i>	581
The Poisson–Dirichlet problem in domains with Ahlfors regular boundary <i>by Ariel Barton, Svitlana Mayboroda, and Alberto Pacati</i>	601
Cohomology rings of character varieties <i>by Anton Mellit</i>	637
Moduli of Galois representations and generalized class groups <i>by James Newton</i>	665
Differential calculus and optimization in persistence module categories <i>by Steve Oudot</i>	677
Spectral gaps in quantum computing <i>by David Pérez-García</i>	713
The matrix A_2 conjecture <i>by Stefanie Petermichl</i>	737
Proofs, computational complexity, and games <i>by Pavel Pudlák</i>	761
The $K(\pi, 1)$ -conjecture for Artin groups <i>by Mario Salvetti</i>	785
Universal symmetries: Global equivariant homotopy theory <i>by Stefan Schwede</i>	807
New tools in hierarchical hyperbolicity: A survey <i>by Alessandro Sisto</i>	829
Noncommutative singularity theory <i>by Gavin Brown and Michael Wemyss</i>	843

EMS prize lectures

Sketches of nonuniformly elliptic Schauder theory	865
<i>by Cristiana De Filippis</i>	
An introduction to representations of p -adic groups	903
<i>by Jessica Fintzen</i>	
Recent progress on the problem of soliton resolution	921
<i>by Jacek Jendrej</i>	
Recent progress on sparse equidistribution	941
<i>by Adam M. Kanigowski</i>	
Recent progress in the study of Latin squares	963
<i>by Richard Montgomery</i>	
Fourier uniqueness pairs and interpolation formulas	975
<i>by Danylo Radchenko</i>	

Other prize lectures

Learning physics simulations for improving design processes in the industry ..	991
<i>by Fabien Casenave</i>	
On the 125th anniversary of his birth: My “encounters” with Otto Neugebauer	1013
<i>by Reinhard Siegmund-Schultze</i>	
Integrable PDE’s for random growth	1039
<i>by Jeremy Quastel</i>	
MUMPS: MULTifrontal Massively Parallel Solver for the direct solution of sparse linear equations	1063
<i>by Patrick R. Amestoy, Jean-Yves L’Excellent, Theo Mary, and Chiara Puglisi</i>	

Public lecture

Tales of (mathematical) paradise	1077
<i>by José Ferreirós</i>	