Mathematics Paper1 June 2014

Resolution of Singularities has long been considered as being a difficult to access area of mathematics. The more systematic and simpler proofs that have appeared in the last few years in zero characteristic now give us a much better understanding of singularities. They reveal the aesthetics of both the logical structure of the proof and the various methods used in it. The present volume is intended for readers who are not yet experts but always wondered about the intricacies of resolution. As such, it provides a gentle and quite comprehensive introduction to this amazing field. The book may tempt the reader to enter more deeply into a topic where many mysteries--especially the positive characteristic case--await to be disclosed. Titles in this series are co-published with the Clay Mathematics Institute (Cambridge, MA). This volume contains the proceedings of the conference on Riemann and Klein Surfaces, Symmetries and Moduli Spaces, in honor of Emilio Bujalance, held from June 24-28, 2013, at Linköping University. The conference and this volume are devoted to the mathematics that Emilio Bujalance has worked with in the following areas, all with a computational flavor: Riemann and Klein surfaces, automorphisms of real and complex surfaces, group actions on surfaces and topological properties of

moduli spaces of complex curves and Abelian varieties.

Electricity is the lifeblood of modern society, and for the vast majority of people that electricity is obtained from large, interconnected power grids. However, the grid that was developed in the 20th century, and the incremental improvements made since then, including its underlying analytic foundations, is no longer adequate to completely meet the needs of the 21st century. The next-generation electric grid must be more flexible and resilient. While fossil fuels will have their place for decades to come, the grid of the future will need to accommodate a wider mix of more intermittent generating sources such as wind and distributed solar photovoltaics. Achieving this grid of the future will require effort on several fronts. There is a need for continued shorter-term engineering research and development, building on the existing analytic foundations for the grid. But there is also a need for more fundamental research to expand these analytic foundations. Analytic Research Foundations for the Next-Generation Electric Grid provide guidance on the longer-term critical areas for research in mathematical and computational sciences that is needed for the next-generation grid. It offers recommendations that are designed to help direct future research as the grid evolves and to give the nation's research and development infrastructure the tools it needs to effectively develop, test, and use

this research.

This book constitutes the refereed proceedings of the 21st International Symposium on Methodologies for Intelligent Systems, ISMIS 2014, held in Roskilde, Denmark, in June 2014. The 61 revised full papers were carefully reviewed and selected from 111 submissions. The papers are organized in topical sections on complex networks and data stream mining; data mining methods; intelligent systems applications; knowledge representation in databases and systems; textual data analysis and mining; special session: challenges in text mining and semantic information retrieval; special session: warehousing and OLAPing complex, spatial and spatio-temporal data; ISMIS posters.

For a long time, World War I has been shortchanged by the historiography of science. Until recently, World War II was usually considered as the defining event for the formation of the modern relationship between science and society. In this context, the effects of the First World War, by contrast, were often limited to the massive deaths of promising young scientists. By focusing on a few key places (Paris, Cambridge, Rome, Chicago, and others), the present book gathers studies representing a broad spectrum of positions adopted by mathematicians about the conflict, from militant pacifism to military, scientific, or ideological mobilization. The use of mathematics for war is thoroughly examined. This

book suggests a new vision of the long-term influence of World War I on mathematics and mathematicians. Continuities and discontinuities in the structure and organization of the mathematical sciences are discussed, as well as their images in various milieux. Topics of research and the values with which they were defended are scrutinized. This book, in particular, proposes a more in-depth evaluation of the issue of modernity and modernization in mathematics. The issue of scientific international relations after the war is revisited by a close look at the situation in a few Allied countries (France, Britain, Italy, and the USA). The historiography has emphasized the place of Germany as the leading mathematical country before WWI and the absurdity of its postwar ostracism by the Allies. The studies presented here help explain how dramatically different prewar situations, prolonged interaction during the war, and new international postwar organizations led to attempts at redrafting models for mathematical developments.

Teaching can be intimidating for beginning faculty. Some graduate schools and some computing faculty provide guidance and mentoring, but many do not. Often, a new faculty member is assigned to teach a course, with little guidance, input, or feedback. Teaching Computing: A Practitioner's Perspective addresses such challenges by providing a solid

resource for both new and experienced computing faculty. The book serves as a practical, easy-to-use resource, covering a wide range of topics in a collection of focused down-to-earth chapters. Based on the authors' extensive teaching experience and his teaching-oriented columns that span 20 years, and informed by computing-education research, the book provides numerous elements that are designed to connect with teaching practitioners, including: A wide range of teaching topics and basic elements of teaching, including tips and techniques Practical tone; the book serves as a down-to-earth practitioners' guide Short, focused chapters Coherent and convenient organization Mix of general educational perspectives and computing-specific elements Connections between teaching in general and teaching computing Both historical and contemporary perspectives This book presents practical approaches, tips, and techniques that provide a strong starting place for new computing faculty and perspectives for reflection by seasoned faculty wishing to freshen their own teaching. The History of Modern Mathematics, Volume I: Ideas and their Reception documents the proceedings of the Symposium on the History of Modern Mathematics held at Vassar College in Poughkeepsie, New York on June 20-24, 1989. This book is concerned with the emergence and reception of major ideas in fields that range from foundations

and set theory, algebra and invariant theory, and number theory to differential geometry, projective and algebraic geometry, line geometry, and transformation groups. Other topics include the theory of reception for the history of mathematics and British synthetic vs. French analytic styles of algebra in the early American Republic. The early geometrical works of Sophus Lie and Felix Klein, background to Gergonne's treatment of duality, and algebraic geometry in the late 19th century are also elaborated. This volume is intended for students and researchers interested in developments in pure mathematics.

This volume contains the proceedings of two conferences on Inverse Problems and Applications, held in 2012, to celebrate the work of Gunther Uhlmann. The first conference was held at the University of California, Irvine, from June 18-22, 2012, and the second was held at Zhejiang University, Hangzhou, China, from September 17-21, 2012. The topics covered include inverse problems in medical imaging, scattering theory, geometry and image processing, and the mathematical theory of cloaking, as well as methods related to inverse problems.

Fractal geometry represents a radical departure from classical geometry, which focuses on smooth objects that "straighten out" under magnification. Fractals, which take their name from the shape of fractured

objects, can be characterized as retaining their lack of smoothness under magnification. The properties of fractals come to light under repeated magnification, which we refer to informally as "zooming in". This zooming-in process has its parallels in dynamics, and the varying "scenery" corresponds to the evolution of dynamical variables. The present monograph focuses on applications of one branch of dynamics--ergodic theory--to the geometry of fractals. Much attention is given to the all-important notion of fractal dimension, which is shown to be intimately related to the study of ergodic averages. It has been long known that dynamical systems serve as a rich source of fractal examples. The primary goal in this monograph is to demonstrate how the minute structure of fractals is unfolded when seen in the light of related dynamics. A co-publication of the AMS and CBMS. 1. The book is complete practice capsule for CTET and TETs Entrances 2. This practice capsule deals with Paper 1 for classes 1 to 5 3. Covers Previous Years' Questions (2021-2013) of various Teaching Entrances 4. More than 3000 Questions are provided for practice 5. Well detailed answers help to understand the concepts Central Teacher Eligibility Test (CTET) or Teacher Eligibility Test (TET) are the national level teaching entrance exams that recruit eligible candidates as teacher who are willing to make their careers in the stream of teaching at

Central or State Government Schools. Prepared under National curriculum pattern, the current edition of "CTET & TETs Previous Years' Solved Papers – Paper 1 for Class 1-5" is a complete practice package for teaching entrances. This book covers all the previous years' questions (2021-2013) providing complete detailed explanations of each question. It has more than 3000 Questions that are asked in various Teaching Entrances that promote self-evaluation by enabling not just practicing and revising concepts but also to keep track of self-progress. Well detailed answers help students to win over doubt and fears associated with exam. Preparation done from this book proves to be highly useful for CTET & TET Paper I in achieving good rank. TABLE OF CONTENT Solved Paper (2021-2013)

1. Success Master Study Guides focus in the preparation of CTET teaching Exam 2. This book deals with CTET Mathematics and Science Paper – I (Classes 1-5) 3. Divided into 5 main Sections completely prepared on the latest exam pattern. 4. Provides Previous years' Solved Papers, 2 Practice Sets and more than 3000 MCQs are given for thorough practice. CTET provides you with an opportunity to make a mark as an educator while teaching in Central Government School. Prepared as per National Curriculum Framework, here's representing the updated edition of "Success Master

CTET Paper I (Class I-V)" that serves as a study guide for the candidates who are willing to appear for the exam this year. The book provides focused study material dividing the entire syllabus into 5 majors providing the complete coverage. With more than 3000 MCQs are provided for the quick revision of the concepts. Chapterwise coverage of the previous Years questions along with the Trend Analysis help aspirants for better preparation. Lastly, Solved Paper 2021 & 2 Practice Sets are given leaving no stones untouched. Preparation done from this book proves to be highly useful for CTET Paper 1 in achieving good rank in the exam. TOC Solved Paper 2021 (January), Solved Paper 2019 (December), Solved Paper 2019 (July), Solved Paper 2018 (December), Solved Paper 2016 (September), Child Development and Pedagogy, English Language and Pedagogy, Hindi Bhasha evm Shiksha-shastra, Mathematics and Pedagogy, Environmental Studies and Pedagogy, Practice Sets (1-2).

The author studies a family of renormalization transformations of generalized diamond hierarchical Potts models through complex dynamical systems. He proves that the Julia set (unstable set) of a renormalization transformation, when it is treated as a complex dynamical system, is the set of complex singularities of the free energy in statistical mechanics. He gives a sufficient and necessary condition for the Julia sets to be disconnected.

Furthermore, he proves that all Fatou components (components of the stable sets) of this family of renormalization transformations are Jordan domains with at most one exception which is completely invariant. In view of the problem in physics about the distribution of these complex singularities, the author proves here a new type of distribution: the set of these complex singularities in the real temperature domain could contain an interval. Finally, the author studies the boundary behavior of the first derivative and second derivative of the free energy on the Fatou component containing the infinity. He also gives an explicit value of the second order critical exponent of the free energy for almost every boundary point.

This volume contains the proceedings of an NSF/Conference Board of the Mathematical Sciences (CBMS) regional conference on Hodge theory, complex geometry, and representation theory, held on June 18, 2012, at the Texas Christian University in Fort Worth, TX. Phillip Griffiths, of the Institute for Advanced Study, gave 10 lectures describing now-classical work concerning how the structure of Shimura varieties as quotients of Mumford-Tate domains by arithmetic groups had been used to understand the relationship between Galois representations and automorphic forms. He then discussed recent breakthroughs of Carayol that provide the possibility of extending these results

beyond the classical case. His lectures will appear as an independent volume in the CBMS series published by the AMS. This volume, which is dedicated to Phillip Griffiths, contains carefully written expository and research articles. Expository papers include discussions of Noether-Lefschetz theory, algebraicity of Hodge loci, and the representation theory of SL2(R). Research articles concern the Hodge conjecture, Harish-Chandra modules, mirror symmetry, Hodge representations of Q-algebraic groups, and compactifications, distributions, and quotients of period domains. It is expected that the book will be of interest primarily to research mathematicians, physicists, and upper-level graduate students.

This book establishes gender issues as a major focus within developments shaping higher education in the Asia Pacific region. The discussion is framed as a response to various dedicated efforts, such as that of the United Nations, to foreground gender as a site for political discourse throughout the region. Throughout the volume, authors confront issues that continue to gain prominence in higher education as a policy arena, including the degree to which higher education operates within a framework of gender equity and how higher education appointments—even promotions—are sensitive to gender. By touching specific instances throughout Korea, Japan, China, Australia, India, Malaysia, Thailand, and Taiwan,

authors offer an unprecedented big-picture view of gender-relevant policy issues.

This volume contains the Proceedings of the 9th International Conference on Harmonic Analysis and Partial Differential Equations, held June 11-15, 2012, in El Escorial, Madrid, Spain. Included in this volume is the written version of the mini-course given by Jonathan Bennett on Aspects of Multilinear Harmonic Analysis Related to Transversality. Also included, among other papers, is a paper by Emmanouil Milakis, Jill Pipher, and Tatiana Toro, which reflects and extends the ideas presented in the mini-course on Analysis on Non-smooth Domains delivered at the conference by Tatiana Toro. The topics of the contributed lectures cover a wide range of the field of Harmonic Analysis and Partial Differential Equations and illustrate the fruitful interplay between the two subfields.

This volume contains the proceedings of the conference `String-Math 2013' which was held June 17-21, 2013 at the Simons Center for Geometry and Physics at Stony Brook University. This was the third in a series of annual meetings devoted to the interface of mathematics and string theory. Topics include the latest developments in supersymmetric and topological field theory, localization techniques, the mathematics of quantum field theory, superstring compactification and duality, scattering amplitudes and their relation to Hodge theory, mirror symmetry and two-dimensional conformal field theory, and many more. This book will be important reading for researchers and students in the area, and for all mathematicians and string theorists who want to update themselves on developments in the math-string interface.

The fame of the Polish school at Lvov rests with the diverse and fundamental contributions of Polish mathematicians

working there during the interwar years. In particular, despite material hardship and without a notable mathematical tradition, the school made major contributions to what is now called functional analysis. The results and names of Banach, Kac, Kuratowski, Mazur, Nikodym, Orlicz, Schauder, Sierpi?ski, Steinhaus, and Ulam, among others, now appear in all the standard textbooks. The vibrant joie de vivre and singular ambience of Lvov's once scintillating social scene are evocatively recaptured in personal recollections. The heyday of the famous Scottish Café--unquestionably the most mathematically productive cafeteria of all time--and its precious Scottish Book of highly influential problems are described in detail, revealing the special synergy of scholarship and camaraderie that permanently elevated Polish mathematics from utter obscurity to global prominence. This chronicle of the Lvov school--its legacy and the tumultuous historical events which defined its lifespan--will appeal equally to mathematicians, historians, or general readers seeking a cultural and institutional overview of key aspects of twentieth-century Polish mathematics not described anywhere else in the extant English-language literature.
Cambridge International AS and A Level Mathematics: Mechanics 1 CoursebookCambridge University Press Inspiring Primary Learners offers trainee and qualified teachers high-quality case studies of outstanding practice in contemporary classrooms across the country. Expert authors unravel and reveal the theory and evidence that underpins lessons, helping you make connections with your own practice and understand what 'excellent' looks like, within each context, and how it is achieved. Illustrated throughout with interviews, photos, and examples of children's work, it covers a range of primary subjects and key topics including creating displays, outdoor learning, and developing a reading

for pleasure culture. The voice of the practitioner is evident throughout as teachers share their own experience, difficulties, and solutions to ensure that children are inspired by their learning. Written in two parts, the first exemplifies examples of practice for each National Curriculum subject, whilst the second focuses on the wider curriculum and explores issues pertinent to the primary classroom, highlighting important discussions on topics such as: Reading for pleasure Writing for pleasure Creating a dynamic and responsive curriculum Creating inspiring displays Outdoor learning Pedagogy for imagination Relationships and Sex Education This key text shows how, even within the contested space of education, practitioners can inspire their primary learners through teaching with passion and purpose for the empowerment of the children in their class. For all new teachers, it provides advice and ideas for effective and engaging learning experiences across the curriculum. This volume contains the proceedings of the International Workshop on Perspectives on High-dimensional Data Analysis II, held May 30-June 1, 2012, at the Centre de Recherches Mathématiques, Université de Montréal, Montréal, Quebec, Canada. This book collates applications and methodological developments in high-dimensional statistics dealing with interesting and challenging problems concerning the analysis of complex, high-dimensional data with a focus on model selection and data reduction. The chapters contained in this book deal with submodel selection and parameter estimation for an array of interesting models. The book also presents some surprising results on high-dimensional data analysis, especially when signals cannot be effectively separated from the noise, it provides a critical assessment of penalty estimation when the model may not be sparse, and it suggests alternative estimation strategies. Readers can apply the suggested methodologies to a host of

applications and also can extend these methodologies in a variety of directions. This volume conveys some of the surprises, puzzles and success stories in big data analysis and related fields. This book is co-published with the Centre de Recherches Mathématiques.

This book constitutes the thoroughly refereed post-conference proceedings of the 6th International Conference on Finite Difference Methods, FDM 2014, held in Lozenetz, Bulgaria, in June 2014. The 36 revised full papers were carefully reviewed and selected from 62 submissions. These papers together with 12 invited papers cover topics such as finite difference and combined finite difference methods as well as finite element methods and their various applications in physics, chemistry, biology and finance.

Northern Ireland is currently undertaking public administration reforms. This report highlights areas where Northern Ireland possesses strengths upon which to build reforms and suggests actions for the future.

The conference to celebrate the resolution of the Poincare conjecture, which is one of the Clay Mathematics Institute's seven Millennium Prize Problems, was held at the Institut Henri Poincare in Paris. Several leading mathematicians gave lectures providing an overview of the conjecture--its history, its influence on the development of mathematics, and, finally, its proof. This volume contains papers based on the lectures at that conference. Taken together, they form an extraordinary record of the work that went into the solution of one of the great problems of mathematics. This monograph deals with recent advances in the study of the long-time asymptotics of large solutions to critical nonlinear dispersive equations. The first part of the

monograph describes, in the context of the energy critical wave equation, the "concentration-compactness/rigidity theorem method" introduced by C. Kenig and F. Merle. This approach has become the canonical method for the study of the "global regularity and well-posedness" conjecture (defocusing case) and the "ground-state" conjecture (focusing case) in critical dispersive problems. The second part of the monograph describes the "channel of energy" method, introduced by T. Duyckaerts, C. Kenig, and F. Merle, to study soliton resolution for nonlinear wave equations. This culminates in a presentation of the proof of the soliton resolution conjecture, for the three-dimensional radial focusing energy critical wave equation. It is the intent that the results described in this book will be a model for what to strive for in the study of other nonlinear dispersive equations. A co-publication of the AMS and CBMS. William Faulkner's character Quentin in The Sound and the Fury repeatedly observes that "temporary" is "the saddest word of all." Despair over human impermanence and the desire to preserve what has been known and felt, even grief, reverberate at the heart of British Poet Laureate Motion's memoir of his childhood and adolescence in rural postwar England. A pæan to his family, and the secret hollows of his beloved home, this memoir evokes a whole world long disappeared. The book begins in December of 1968, hours before his mother's foxhunting accident and subsequent coma from which she never recovers. This memoir is far more than a guide to the life behind the poems; it is a stand against the ineluctability of time's passing, an insistence that

what has been "felt in the blood, and felt in the blood, and felt along the heart," is, as the epigraph from Wordsworth suggests, an integral substance of our anatomy, a part that can be neither taken from us nor lost.

Science has never been more important, yet science education faces serious challenges. At present, science education research only sees half the picture, focusing on how students learn and their changing conceptions. Both teaching practice and what is taught, science knowledge itself, are missing. This book offers new, interdisciplinary ways of thinking about science teaching that foreground the forms taken by science knowledge and the language, imagery and gesture through which they are expressed. This book brings together leading international scholars from Systemic Functional Linguistics, a long-established approach to language, and Legitimation Code Theory, a rapidly growing sociological approach to knowledge practices. It explores how to bring knowledge, language and pedagogy back into the picture of science education but also offers radical innovations that will shape future research. Part I sets out new ways of understanding the role of knowledge in integrating mathematics into science, teaching scientific explanations and using multimedia resources such as animations. Part II provides new concepts for showing the role of language in complex scientific explanations, in how scientific taxonomies are built, and in combining with mathematics and images to create science knowledge. Part III draws on the approaches to explore how more students can access

scientific knowledge, how to teach professional reasoning, the role of body language in science teaching, and making mathematics understandable to all learners. Teaching Science offers major leaps forward in understanding knowledge, language and pedagogy that will shape the research agenda far beyond science education.

The theory of semigroups is a relatively young branch of mathematics, with most of the major results having appeared after the Second World War. This book describes the evolution of (algebraic) semigroup theory from its earliest origins to the establishment of a full-fledged theory. Semigroup theory might be termed `Cold War mathematics' because of the time during which it developed. There were thriving schools on both sides of the Iron Curtain, although the two sides were not always able to communicate with each other, or even gain access to the other's publications. A major theme of this book is the comparison of the approaches to the subject of mathematicians in East and West, and the study of the extent to which contact between the two sides was possible.

The author develops a homology theory for Smale spaces, which include the basics sets for an Axiom A diffeomorphism. It is based on two ingredients. The first is an improved version of Bowen's result that every such system is the image of a shift of finite type under a finite-to-one factor map. The second is Krieger's dimension group invariant for shifts of finite type. He proves a Lefschetz formula which relates the number of periodic points of the system for a given period to trace data from

the action of the dynamics on the homology groups. The existence of such a theory was proposed by Bowen in the 1970s.
This series for Key Stage 3 mathematics has been written to exactly match the Framework for teaching mathematics. It comprises parallel resources for each year covering all ability levels, allowing a consistent but fully differentiated approach.
S Chand's ISC Mathematics is structured according to the latest syllabus as per the new CISCE(Council for the Indian School Certificate Examinations), New Delhi, for ISC students taking classes XI & XII examinations.
The History of Modern Mathematics, Volume II: Institutions and Applications focuses on the history and progress of methodologies, techniques, principles, and approaches involved in modern mathematics. The selection first elaborates on crystallographic symmetry concepts and group theory, case of potential theory and electrodynamics, and geometrization of analytical mechanics. Discussions focus on differential geometry and least action, intrinsic differential geometry, physically-motivated research in potential theory, introduction of potentials in electrodynamics, and group theory and crystallography in the mid-19th century. The text then elaborates on Schouten, Levi-Civita, and emergence of tensor calculus, modes and manners of applied mathematics, and pure and applied mathematics in divergent institutional settings in Germany. Topics include function of mathematics within technical colleges, evolvement of the notion of applied mathematics, rise of technical colleges, and an engineering approach to mechanics. The publication examines the transformation of numerical analysis by the computer; mathematics at the Berlin Technische Hochschule/Technische Universität; and contribution of mathematical societies to promoting applications of

mathematics in Germany. The selection is a valuable reference for mathematicians and researchers interested in the history of modern mathematics. Mathematical institutions in France and Germany and their role in promoting applications Relationship between mathematics and physics Foundations of mathematics Complex variable theory, geometry and topology Geometry in the spirit of Klein's Erlangen program Algebra and number theory Formative influences on mathematics in the United States

This book is a collection of expository articles based on four lecture series presented during the 2012 Notre Dame Summer School in Topology and Field Theories. The four topics covered in this volume are: Construction of a local conformal field theory associated to a compact Lie group, a level and a Frobenius object in the corresponding fusion category; Field theory interpretation of certain polynomial invariants associated to knots and links; Homotopy theoretic construction of far-reaching generalizations of the topological field theories that Dijkgraf and Witten associated to finite groups; and a discussion of the action of the orthogonal group on the full subcategory of an -category consisting of the fully dualizable objects. The expository style of the articles enables non-experts to understand the basic ideas of this wide range of important topics.

In recent years, the United Kingdom has become a more and more divided society with inequality between the regions as marked as it has ever been. In a landmark analysis of the current state of Britain's regional development, Philip McCann utilises current statistics, examines historical trends and makes pertinent international comparisons to assess the state of the nation. The UK Regional–National Economic Problem brings attention to the highly centralised, top down governance structure that the UK deploys, and demonstrates that it is less than ideally placed to rectify these inequalities.

The 'North-South' divide in the UK has never been greater and the rising inequalities are evident in almost all aspects of the economy including productivity, incomes, employment status and wealth. Whilst the traditional economic dominance of London and its hinterland has continued along with relative resilience in the South West of England and Scotland, in contrast the Midlands, the North of England, Northern Ireland and Wales lag behind by most measures of prosperity. This inequality is greatly limiting national economic performance and the fact that Britain has a below average standard of living by European and OECD terms has been ignored. The UK's economic and governance inequality is unlikely to be fundamentally rebalanced by the current governance and connectivity trends, although this definitive study suggests that some areas of improvement are possible if they are well implemented. This pivotal analysis is essential reading for postgraduate students in economics and urban studies as well as researchers and policy makers in local and central government.

Cambridge AS and A Level Mathematics is a revised series to ensure full syllabus coverage. This coursebook has been revised and updated to ensure that it meets the requirements for the Mechanics 1 (M1) unit of Cambridge AS and A Level Mathematics (9709). This revised edition adds clarifications to sections on forces and equilibrium, kinematics of motion in a straight line and Newton's laws of motion. All of the review questions have been updated to reflect changes in the style of questions asked in the course.

In 2012, the Centre de Recherches Mathématiques was at the center of many interesting developments in geometric and spectral analysis, with a thematic program on Geometric Analysis and Spectral Theory followed by a thematic year on Moduli Spaces, Extremality and Global Invariants. This volume contains original contributions as well as useful

survey articles of recent developments by participants from three of the workshops organized during these programs: Geometry of Eigenvalues and Eigenfunctions, held from June 4-8, 2012; Manifolds of Metrics and Probabilistic Methods in Geometry and Analysis, held from July 2-6, 2012; and Spectral Invariants on Non-compact and Singular Spaces, held from July 23-27, 2012. The topics covered in this volume include Fourier integral operators, eigenfunctions, probability and analysis on singular spaces, complex geometry, Kähler-Einstein metrics, analytic torsion, and Strichartz estimates. This book is co-published with the Centre de Recherches Mathématiques.