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Each volume includes "Wissenschaftliche zeitschriften." Introduced by Peter Scholze in 2011, perfectoid spaces are a bridge between geometry in characteristic 0 and characteristic p , and have been used to solve many important problems, including cases of the weight-monodromy conjecture and the association of Galois representations to torsion classes in cohomology. In recognition of the transformative impact perfectoid spaces have had on the field of arithmetic geometry, Scholze was awarded a Fields Medal in 2018. This book, originating from a series of lectures given at the 2017 Arizona Winter School on perfectoid spaces, provides a broad introduction to the subject. After an introduction with insight into the history and future of the subject by Peter Scholze, Jared Weinstein gives a user-friendly and utilitarian account of the theory of adic spaces. Kiran Kedlaya further develops the foundational material, studies vector bundles on Fargues–Fontaine curves, and introduces diamonds and shtukas over them with a view toward the local Langlands correspondence. Bhargav Bhatt explains the application of perfectoid spaces to comparison isomorphisms in p -adic Hodge theory. Finally, Ana Caraiani explains the application of perfectoid spaces to the construction of Galois representations associated to torsion classes in the cohomology of locally symmetric spaces for the general linear group. This book will be an invaluable asset for any graduate student or researcher interested in the theory of perfectoid spaces and their applications.

The Proceedings of the ICM publishes the talks, by invited speakers, at the conference organized by the International Mathematical Union every 4 years. It covers several areas of Mathematics and it includes the Fields Medal and

Nevanlinna, Gauss and Leelavati Prizes and the Chern Medal laudatios.

In *Realizing the Distinctive University: Vision and Values, Strategy and Culture*, Mark William Roche changes the terms of the debate about American higher education. A former dean of the College of Arts and Letters at the University of Notre Dame, Roche argues for the importance of an institutional vision, not simply a brand, and while he extols the value of entrepreneurship, he defines it in contrast to the corporate drive toward commercialization and demands for business management models. Using the history of the German university to assess the need for, and implementation of, distinctive visions at American colleges and universities, Roche's own vision benefits from his deep connection to both systems as well as his experience in the trenches working to realize the special mission of an American Catholic university. Roche makes a significant contribution by delineating means for moving such an institution from vision to implementation. Roche provides a road map to creating a superb arts and sciences college within a major research university and offers a rich analysis of five principles that have shaped the modern American university: flexibility, competition, incentives, accountability, and community. He notes the challenges and problems that surface with these categories and includes ample illustration of both best practices and personal missteps. The book makes clear that even a compelling intellectual vision must always be linked to its embodiment in rhetoric, support structures, and community. Throughout this unique and appealing contribution to the literature on higher education, Roche avoids polemic and remains optimistic about the ways in which a faculty member serving in administration can make a positive difference. *Realizing the Distinctive University* is a must read for academic administrators, faculty members

interested in the inner workings of the university, and graduate students and scholars of higher education. Combines poignant social histories of women in 10 countries with interviews of high-ranking women from those countries who talk about their family life in respect to career. Drawing on personal interviews, journals, memoirs, and his own experiences, the author chronicles the lives of a generation of young German Jews who fled Germany in the wake of Hitler's rise to power in 1933.

Polymer and cell dynamics play an important role in processes like tumor growth, metastasis, embryogenesis, immune reactions and regeneration. Based on an international workshop on numerical simulations of polymer and cell dynamics in Bad Honnef (Germany) in 2000, this volume provides an overview of the relevant mathematical and numerical methods, their applications and limits. Polymer and Cell Dynamics will be of interest to scientists and advanced undergraduates.

Sources, which have so far often been overshadowed by chronicles and normative literature, are also the focus of interest of this book. Treatises against unacceptable innovations, pilgrims guidebooks, travel reports, prosopographical and biographical writings, journals and diaries, folk novels, documents and law manuals can provide us with valuable information. But what generally applies for Mamlukology is the fact that an enormous amount of fundamental work in the edition of texts remains yet to be done. Many Mamlukists are

primarily engaged in this activity. It may also have been this unavoidable focus on handwritten materials that resulted in the fact that the scholars studying the Mamluk Era have only very rarely occupied themselves with interdisciplinary questions or theoretical hypotheses. Nevertheless, during the last ten years a lot of innovative research has been done in this field. For the first time, this book presents the state of the art with regards to the Mamluk Empire.

This volume is a collection of papers dedicated to the memory of the late Tikva Lecker. Professor Lecker's many interests included topics in labor economics, women and the economy, the economics of Judaism, the economics of migration and every aspect of the economic experience of immigrants and their descendants. Each chapter in this volume honors the memory of Professor Lecker by presenting research on a topic in which she was especially interested. *The Research in Labor Economics series was started in 1977 *Each volume consists of a collection of refereed research papers written by top economists *Recent volumes have hosted papers from D. Acemoglu, J.D. Angrist, D. Card, H. Farber, A. Kreuger, E. Lazear, G. Field, and J. Mincer, among others

Berkeley Lectures on p-adic Geometry presents an important breakthrough in arithmetic geometry. In 2014, leading mathematician Peter Scholze

delivered a series of lectures at the University of California, Berkeley, on new ideas in the theory of p -adic geometry. Building on his discovery of perfectoid spaces, Scholze introduced the concept of “diamonds,” which are to perfectoid spaces what algebraic spaces are to schemes. The introduction of diamonds, along with the development of a mixed-characteristic shtuka, set the stage for a critical advance in the discipline. In this book, Peter Scholze and Jared Weinstein show that the moduli space of mixed-characteristic shtukas is a diamond, raising the possibility of using the cohomology of such spaces to attack the Langlands conjectures for a reductive group over a p -adic field. This book follows the informal style of the original Berkeley lectures, with one chapter per lecture. It explores p -adic and perfectoid spaces before laying out the newer theory of shtukas and their moduli spaces. Points of contact with other threads of the subject, including p -divisible groups, p -adic Hodge theory, and Rapoport-Zink spaces, are thoroughly explained. Berkeley Lectures on p -adic Geometry will be a useful resource for students and scholars working in arithmetic geometry and number theory.

In the United States at the height of the Cold War, roughly between the end of World War II and the early 1980s, a new project of redefining rationality commanded the attention of sharp minds, powerful politicians, wealthy foundations, and top military

brass. Its home was the human sciences—psychology, sociology, political science, and economics, among others—and its participants enlisted in an intellectual campaign to figure out what rationality should mean and how it could be deployed. *How Reason Almost Lost Its Mind* brings to life the people—Herbert Simon, Oskar Morgenstern, Herman Kahn, Anatol Rapoport, Thomas Schelling, and many others—and places, including the RAND Corporation, the Center for Advanced Study in the Behavioral Sciences, the Cowles Commission for Research and Economics, and the Council on Foreign Relations, that played a key role in putting forth a “Cold War rationality.” Decision makers harnessed this picture of rationality—optimizing, formal, algorithmic, and mechanical—in their quest to understand phenomena as diverse as economic transactions, biological evolution, political elections, international relations, and military strategy. The authors chronicle and illuminate what it meant to be rational in the age of nuclear brinkmanship.

Includes special issues: The Professional series in the management sciences.

Includes essays on Henry James, Rudyard Kipling, Leonard and Virginia Woolf, D. H. Lawrence, George Orwell, 1984, Mountbatten, Winston Churchill, among others.

The new edition of this celebrated and long-

unavailable book preserves the original book's content and structure and its unrivalled presentation of a universal method for the resolution of a class of singularities in algebraic geometry.

When does physics depart the realm of testable hypothesis and come to resemble theology? Peter Woit argues that string theory isn't just going in the wrong direction, it's not even science. *Not Even Wrong* shows that what many physicists call superstring "theory" is not a theory at all. It makes no predictions, not even wrong ones, and this very lack of falsifiability is what has allowed the subject to survive and flourish. Peter Woit explains why the mathematical conditions for progress in physics are entirely absent from superstring theory today, offering the other side of the story.

Conference proceedings based on the 1996 LMS Durham Symposium 'Galois representations in arithmetic algebraic geometry'.

This book is, on the one hand, a pedagogical introduction to the formalism of slopes, of semi-stability and of related concepts in the simplest possible context. It is therefore accessible to any graduate student with a basic knowledge in algebraic geometry and algebraic groups. On the other hand, the book also provides a thorough introduction to the basics of period domains, as they appear in the geometric approach to local Langlands correspondences and in the recent conjectural p-

adic local Langlands program. The authors provide numerous worked examples and establish many connections to topics in the general area of algebraic groups over finite and local fields. In addition, the end of each section includes remarks on open questions, historical context and references to the literature.

The alternating double auction market institution is presented as a discrete time version of the open outcry market. The game in extensive form is analyzed in an almost perfect information setting, using the concept of subgame perfectness. By applying two new equilibrium selection criteria, a general existence result is obtained for "impatience equilibria" of the game. All such equilibria are shown to have unique properties concerning the traded quantities and prices. The most important results are that the equilibrium prices are independent of the number of traders and are always very close to - if not inside - the range of competitive prices. The latter can be evaluated as game theoretic support for the convergence of prices to the competitive price. The process of price formation is traced by applying the learning direction theory and introducing the "anchor price hypothesis".

Modular Forms and Special Cycles on Shimura Curves is a thorough study of the generating functions constructed from special cycles, both divisors and zero-cycles, on the arithmetic surface "M" attached to a Shimura curve "M" over

the field of rational numbers. These generating functions are shown to be the q -expansions of modular forms and Siegel modular forms of genus two respectively, valued in the Gillet-Soulé arithmetic Chow groups of "M". The two types of generating functions are related via an arithmetic inner product formula. In addition, an analogue of the classical Siegel-Weil formula identifies the generating function for zero-cycles as the central derivative of a Siegel Eisenstein series. As an application, an arithmetic analogue of the Shimura-Waldspurger correspondence is constructed, carrying holomorphic cusp forms of weight $3/2$ to classes in the Mordell-Weil group of "M". In certain cases, the nonvanishing of this correspondence is related to the central derivative of the standard L-function for a modular form of weight 2. These results depend on a novel mixture of modular forms and arithmetic geometry and should provide a paradigm for further investigations. The proofs involve a wide range of techniques, including arithmetic intersection theory, the arithmetic adjunction formula, representation densities of quadratic forms, deformation theory of p -divisible groups, p -adic uniformization, the Weil representation, the local and global theta correspondence, and the doubling integral representation of L-functions.

An insightful reflection on the mathematical soul What do pure mathematicians do, and why do they do it? Looking beyond the conventional answers—for the sake of truth, beauty, and practical applications—this book offers an eclectic panorama of the lives and values and hopes and fears of mathematicians in the twenty-first century, assembling material from a startlingly diverse assortment of scholarly, journalistic, and pop culture sources. Drawing on his personal experiences and obsessions as well as the thoughts and opinions of mathematicians from Archimedes and Omar Khayyám to such contemporary giants as Alexander

Grothendieck and Robert Langlands, Michael Harris reveals the charisma and romance of mathematics as well as its darker side. In this portrait of mathematics as a community united around a set of common intellectual, ethical, and existential challenges, he touches on a wide variety of questions, such as: Are mathematicians to blame for the 2008 financial crisis? How can we talk about the ideas we were born too soon to understand? And how should you react if you are asked to explain number theory at a dinner party? Disarmingly candid, relentlessly intelligent, and richly entertaining, *Mathematics without Apologies* takes readers on an unapologetic guided tour of the mathematical life, from the philosophy and sociology of mathematics to its reflections in film and popular music, with detours through the mathematical and mystical traditions of Russia, India, medieval Islam, the Bronx, and beyond.

Vols. for contain reports of the general assemblies.

In *Damascus Life 1480-1500: A Report of a Local Notary* Boaz Shoshan writes the microhistory of Ibn ?awq, a lower middle class clerk who worked in the city ?s legal system on the eve of the Ottoman conquest, based on his unique diary.

This book constitutes the refereed proceedings of the 12th Latin American Symposium on Theoretical Informatics, LATIN 2016, held in Ensenada, Mexico, in April 2016. The 52 papers presented together with 5 abstracts were carefully reviewed and selected from 131 submissions. The papers address a variety of topics in theoretical computer science with a certain focus on algorithms (approximation, online, randomized, algorithmic game theory, etc.), analytic combinatorics and analysis of algorithms, automata theory and formal languages, coding theory and data compression, combinatorial algorithms, combinatorial optimization, combinatorics and graph theory, complexity theory, computational algebra, computational biology, computational

geometry, computational number theory, cryptology, databases and information retrieval, data structures, formal methods and security, Internet and the web, parallel and distributed computing, pattern matching, programming language theory, and random structures.

It is rarely appreciated how much of the history of Eurasian medicine in the premodern period hinges on cross-cultural interactions and knowledge transmissions. Using manuscripts found in key Eurasian nodes of the medieval world – Dunhuang, Kucha, the Cairo Genizah and Tabriz – the book analyses a number of case-studies of Eurasian medical encounters, giving a voice to places, languages, people and narratives which were once prominent but have gone silent. This is an important book for those interested in the history of medicine and the transmissions of knowledge that have taken place over the course of global history.

This volume contains the written account of the Bonn Seminar on Arithmetic Geometry 2003/2004. It gives a coherent exposition of the theory of intersections of modular correspondences. The focus of the seminar is the formula for the intersection number of arithmetic modular correspondences due to Gross and Keating. Other topics treated are Hurwitz's theorem on the intersection of modular correspondences over the field of complex numbers and the relation of the arithmetic intersection numbers to Fourier coefficients of Siegel-Eisenstein series. Also included is background material on one-dimensional formal groups and their endomorphisms and on quadratic forms over the ring of \mathbb{p} -adic integers.

Period Domains over Finite and p -adic Fields
Cambridge University Press

This book constitutes the proceedings of the 10th Latin American Symposium on Theoretical Informatics, LATIN 2012, held in Arequipa, Peru, in April 2012. The 55 papers

presented in this volume were carefully reviewed and selected from 153 submissions. The papers address a variety of topics in theoretical computer science with a certain focus on algorithms, automata theory and formal languages, coding theory and data compression, algorithmic graph theory and combinatorics, complexity theory, computational algebra, computational biology, computational geometry, computational number theory, cryptography, theoretical aspects of databases and information retrieval, data structures, networks, logic in computer science, machine learning, mathematical programming, parallel and distributed computing, pattern matching, quantum computing and random structures.

In the history of science "paradoxes" are not only amusing puzzles and challenges to the human mind but also driving forces of scientific development. The notion of "paradox" is intimately related to the notion of "contradiction". Logical paradoxes allow for the derivation of contradictory propositions (e.g. "Russell's set of all sets not being members of themselves" or the ancient problem with propositions like "I am lying" ¹), normative paradoxes deal with contradictions among equally well accepted normative postulates (Arrow's "impossibility theorem", Sen's "Impossibility of a Paretian Liberal") and "factual" paradoxes refer to conflicts between conventional opinion based on an accepted empirical theory and contradictory empirical evidence (e.g. the "St. Petersburg paradox" or the "Allais paradox" in decision theory²). Paradoxes, either logical, normative or factual, also contradict our intuitions. The counter-intuitive property which seems to be a common feature of all paradoxes plays an important part in the empirical social sciences, particularly in the old research tradition of scrutinizing the unintended consequences of purposive actions. Expectations based on naive theories ignoring

interdependencies between individual actions are very often in conflict with "surprising" empirical evidence on collective results of social behavior. Examples are numerous reaching from panic situations, the individual struggle for status gains resulting in collective deprivation, the less than optimal supply of collective goods etc. to global problems of the armament race and mismanagement of common resources.

In the early years of the 1980s, while I was visiting the Institute for Advanced Study (IAS) at Princeton as a postdoctoral member, I got a fascinating view, studying congruence modulo a prime among elliptic modular forms, that an automorphic L-function of a given algebraic group G should have a canonical p -adic counterpart of several variables. I immediately decided to find out the reason behind this phenomenon and to develop the theory of ordinary p -adic automorphic forms, allocating 10 to 15 years from that point, putting off the intended arithmetic study of Shimura varieties via L-functions and Eisenstein series (for which I visited IAS). Although it took more than 15 years, we now know (at least conjecturally) the exact number of variables for a given G , and it has been shown that this is a universal phenomenon valid for holomorphic automorphic forms on Shimura varieties and also for more general (nonholomorphic) cohomological automorphic forms on automorphic manifolds (in a markedly different way). When I was asked to give a series of lectures in the Automorphic Semester in the year 2000 at the Emile Borel Center (Centre Emile Borel) at the Poincare Institute in Paris, I chose to give an exposition of the theory of p -adic (ordinary) families of such automorphic forms p -adically depending on their weights, and this book is the outgrowth of the lectures given there.

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