Lectures On Hilbert Modular Varieties And Modular Forms Crm Monograph Series

Hilbert Modular Forms Lectures on Hilbert Modular Surfaces **Hilbert Modular Surfaces** Lectures on Hilbert Modular Varieties and Modular Forms **Hilbert Modular Forms and Iwasawa Theory** **Hilbert Modular Surfaces** *Elliptic Curves, Hilbert Modular Forms and Galois Deformations* Periods of Hilbert Modular Surfaces **Hilbert Modular Forms** Hilbert Modular Surfaces **Hilbert Modular Forms** *On Hilbert Modular Surfaces of Principal Congruence Subgroups* **Hilbert Modular Surfaces** Hilbert Modular Forms for the Fields Q(√5), Q(√13) and Q(√17) **Hilbert Modular Forms with Coefficients in Intersection Homology and Quadratic Base Change** **Lectures on Hilbert Modular Varieties and Modular Forms** *The Arithmetic Genus of Hilbert Modular Threefolds* **The 1-2-3 of Modular Forms Non-Archimedean L-functions of Siegel and Hilbert Modular Forms Hilbert Modular Forms and Iwasawa Theory** *Hilbert Modular Forms and Iwasawa Theory* Holomorphic Hilbert Modular Forms **Hilbert Modular Forms with Coefficients in Intersection Homology and Quadratic Base Change** *Periods of Hilbert Modular Surfaces* **Twisted Teichmüller Curves** *Hilbert Modular Forms: mod p and p-Adic Aspects* **Hilbert Modular Surfaces** Borcherds Products on O(2,l) and Chern Classes of Heegner Divisors *Elliptic Curves, Hilbert Modular Forms and Galois Deformations* **Automorphy factors for a Hilbert modular group** Jacobi Forms, Finite Quadratic Modules and Weil Representations over

Number Fields Modular Functions of One Variable **Non-Archimedean L-functions of Siegel and Hilbert Modular Forms Signature defects of cusps of Hilbert modular varieties and values of L-series at s Noncommutative Geometry and Number Theory Introductory Lectures on Siegel Modular Forms Modular Forms: A Classical Approach** Modular Forms and Related Topics in Number Theory **Automorphic Forms and Geometry of Arithmetic Varieties Arithmetic, Analytic, and Geometric Aspects of the Theory of Modular Forms**

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Modular Forms and Related Topics in Number Theory Oct 30 2019 This book collects the papers presented at the Conference on Number Theory, held at the Kerala School of Mathematics, Kozhikode, Kerala, India, from December 10–14, 2018. The conference aimed at bringing the active number theorists and researchers in automorphic forms and allied areas to demonstrate their current research works. This book benefits young research scholars, postdoctoral fellows, and young faculty members working in these areas of research.
Hilbert Modular Forms and Iwasawa Theory Apr 16 2021 Describing the applications found for the Wiles and Taylor technique, this book generalizes the deformation theoretic techniques of Wiles-Taylor to Hilbert modular forms (following Fujiwara's treatment), and also discusses applications found by the author.
Hilbert Modular Forms and Iwasawa Theory Sep 02 2022 The 1995 work of Wiles and Taylor-Wiles opened up a whole new technique in algebraic number theory and, a decade on, the waves caused by this incredibly important work are still being felt. This book, authored by a leading researcher, describes the striking applications that have been found for this technique. In the book, the deformation theoretic techniques of Wiles-Taylor are first generalized to Hilbert modular forms (following Fujiwara's treatment), and some applications found by the author are then discussed. With many exercises and open questions given, this text is ideal for researchers and graduate students entering this research area.
Signature defects of cusps of Hilbert modular varieties and values of L-series at s Mar 04 2020
Hilbert Modular Forms Feb 24 2022 Important results on the Hilbert modular group and Hilbert modular forms are introduced and described in this book. In recent times, this branch of number theory has been given more

and more attention and thus the need for a comprehensive presentation of these results, previously scattered in research journal papers, has become obvious. The main aim of this book is to give a description of the singular cohomology and its Hodge decomposition including explicit formulae. The author has succeeded in giving proofs which are both elementary and complete. The book contains an introduction to Hilbert modular forms, reduction theory, the trace formula and Shimizu's formulae, the work of Matsushima and Shimura, analytic continuation of Eisenstein series, the cohomology and its Hodge decomposition. Basic facts about algebraic numbers, integration, alternating differential forms and Hodge theory are included in convenient appendices so that the book can be used by students with a knowledge of complex analysis (one variable) and algebra.

Holomorphic Hilbert Modular Forms Mar 16 2021 An introduction to a substantial part of the theory of holomorphic Hilbert modular forms, associated L-functions, and their arithmetic. As such, it is an introduction to the theory of automorphic forms in general, especially to the arithmetic of holomorphic forms. Annotation copyrighted by Book News, Inc., Portland, OR

Modular Forms: A Classical Approach Dec 01 2019 The theory of modular forms is a fundamental tool used in many areas of mathematics and physics. It is also a very concrete and “fun” subject in itself and abounds with an amazing number of surprising identities. This comprehensive textbook, which includes numerous exercises, aims to give a complete picture of the classical aspects of the subject, with an emphasis on explicit formulas. After a number of motivating examples such as elliptic functions and theta functions, the modular group, its subgroups, and general aspects of holomorphic and nonholomorphic modular forms are explained, with an emphasis on explicit examples. The heart of the book is the classical

theory developed by Hecke and continued up to the Atkin–Lehner–Li theory of newforms and including the theory of Eisenstein series, Rankin–Selberg theory, and a more general theory of theta series including the Weil representation. The final chapter explores in some detail more general types of modular forms such as half-integral weight, Hilbert, Jacobi, Maass, and Siegel modular forms. Some “gems” of the book are an immediately implementable trace formula for Hecke operators, generalizations of Haberland's formulas for the computation of Petersson inner products, W. Li's little-known theorem on the diagonalization of the full space of modular forms, and explicit algorithms due to the second author for computing Maass forms. This book is essentially self-contained, the necessary tools such as gamma and Bessel functions, Bernoulli numbers, and so on being given in a separate chapter.

Hilbert Modular Forms for the Fields Q(√5), Q(√13) and Q(√17) Nov 23 2021

Hilbert Modular Forms and Iwasawa Theory May 18 2021

The 1-2-3 of Modular Forms Jul 20 2021 This book grew out of three series of lectures given at the summer school on "Modular Forms and their Applications" at the Sophus Lie Conference Center in Nordfjordeid in June 2004. The first series treats the classical one-variable theory of elliptic modular forms. The second series presents the theory of Hilbert modular forms in two variables and Hilbert modular surfaces. The third series gives an introduction to Siegel modular forms and discusses a conjecture by Harder. It also contains Harder's original manuscript with the conjecture. Each part treats a number of beautiful applications.

Non-Archimedean L-functions of Siegel and Hilbert Modular Forms Apr 04 2020 1) p n=1 The set of arguments s for which ((s) is defined can be extended to all s E C,s :f:. 1, and we may regard C as the group of all continuous quasicharacters C = Hom(R~, c>

Arithmetic, Analytic, and Geometric Aspects of the Theory of Modular Forms Aug 28 2019
Hilbert Modular Forms with Coefficients in Intersection Homology and Quadratic Base Change Oct 23 2021 In the 1970s Hirzebruch and Zagier produced elliptic modular forms with coefficients in the homology of a Hilbert modular surface. They then computed the Fourier coefficients of these forms in terms of period integrals and L-functions. In this book the authors take an alternate approach to these theorems and generalize them to the setting of Hilbert modular varieties of arbitrary dimension. The approach is conceptual and uses tools that were not available to Hirzebruch and Zagier, including intersection homology theory, properties of modular cycles, and base change. Automorphic vector bundles, Hecke operators and Fourier coefficients of modular forms are presented both in the classical and adèlic settings. The book should provide a foundation for approaching similar questions for other locally symmetric spaces.
Hilbert Modular Surfaces Dec 25 2021
Hilbert Modular Surfaces Oct 11 2020
On Hilbert Modular Surfaces of Principal Congruence Subgroups Jan 26 2022
The Arithmetic Genus of Hilbert Modular Threefolds Aug 21 2021
Modular Functions of One Variable May 06 2020
Hilbert Modular Forms with Coefficients in Intersection Homology and Quadratic Base Change Feb 12 2021 In the 1970s Hirzebruch and Zagier produced elliptic modular forms with coefficients in the homology of a Hilbert modular surface. They then computed the Fourier coefficients of these forms in terms of period integrals and L-functions. In this book the authors take an alternate approach to these theorems and generalize them to the setting of Hilbert modular varieties of arbitrary dimension. The approach is conceptual and uses tools that were not available to Hirzebruch and Zagier, including intersection homology theory,

properties of modular cycles, and base change. Automorphic vector bundles, Hecke operators and Fourier coefficients of modular forms are presented both in the classical and adèlic settings. The book should provide a foundation for approaching similar questions for other locally symmetric spaces.

Introductory Lectures on Siegel Modular Forms Jan 02 2020 From their inception, Siegel modular forms have been studied extensively because of their significance in both automorphic functions in several complex variables and number theory. The comprehensive theory of automorphic forms to subgroups of algebraic groups and the arithmetical theory of modular forms illustrate these two aspects in an illuminating manner. The author's aim is to present a straightforward and easily accessible survey of the main ideas of the theory at an elementary level, providing a sound basis from which the reader can study advanced works and undertake original research. This book is based on lectures given by the author for a number of years and is intended for a one-semester graduate course, though it can also be used profitably for self-study. The only prerequisites are a basic knowledge of algebra, number theory and complex analysis.

Hilbert Modular Forms: mod p and p-Adic Aspects Nov 11 2020 We study Hilbert modular forms in characteristic p and over p-adic rings. In the characteristic p theory we describe the kernel and image of the q-expansion map and prove the existence of filtration for Hilbert modular forms; we define operators U, V and Θ_χ and study the variation of the filtration under these operators. Our methods are geometric - comparing holomorphic Hilbert modular forms with rational functions on a moduli scheme with level-p structure, whose poles are supported on the non-ordinary locus.In the p-adic theory we study congruences between Hilbert modular forms. This applies to the study of congruences

between special values of zeta functions of totally real fields. It also allows us to define p-adic Hilbert modular forms 'a la Serre' as p-adic uniform limit of classical modular forms, and compare them with p-adic modular forms 'a la Katz' that are regular functions on a certain formal moduli scheme. We show that the two notions agree for cusp forms and for a suitable class of weights containing all the classical ones. We extend the operators V and Θ_χ to the p-adic setting.

Periods of Hilbert Modular Surfaces May 30 2022 The arithmetic theory of periods of modular forms is revealing its nature as Diophantine index theorem. This paper is an attempt to amplify this universal principle by discussing a special case: Hodge structures of Hilbert modular surfaces.

Hilbert Modular Surfaces Nov 04 2022 Over the last 15 years important results have been achieved in the field of Hilbert Modular Varieties. Though the main emphasis of this book is on the geometry of Hilbert modular surfaces, both geometric and arithmetic aspects are treated. An abundance of examples - in fact a whole chapter - completes this competent presentation of the subject. This Ergebnisbericht will soon become an indispensible tool for graduate students and researchers in this field.

Lectures on Hilbert Modular Varieties and Modular Forms Sep 21 2021 This book is devoted to certain aspects of the theory of p-adic Hilbert modular forms and moduli spaces of abelian varieties with real multiplication. The theory of p-adic modular forms is presented first in the elliptic case, introducing the reader to key ideas of N. M. Katz and J.-P. Serre. It is re-interpreted from a geometric point of view, which is developed to present the rudiments of a similar theory for Hilbert modular forms. The theory of moduli spaces of abelianvarieties with real multiplication is presented first very explicitly over the complex numbers. Aspects of the general theory are then exposed, in

particular, local deformation theory of abelian varieties in positive characteristic. The arithmetic of p-adic Hilbert modular forms and the geometry ofmoduli spaces of abelian varieties are related. This relation is used to study q-expansions of Hilbert modular forms, on the one hand, and stratifications of moduli spaces on the other hand. The book is addressed to graduate students and non-experts. It attempts to provide the necessary background to all concepts exposed in it. It may serve as a textbook for an advanced graduate course.

Non-Archimedean L-functions of Siegel and Hilbert Modular Forms Jun 18 2021

Jacobi Forms, Finite Quadratic Modules and Weil Representations over Number Fields Jun 06 2020 The new theory of Jacobi forms over totally real number fields introduced in this monograph is expected to give further insight into the arithmetic theory of Hilbert modular forms, its L-series, and into elliptic curves over number fields. This work is inspired by the classical theory of Jacobi forms over the rational numbers, which is an indispensable tool in the arithmetic theory of elliptic modular forms, elliptic curves, and in many other disciplines in mathematics and physics. Jacobi forms can be viewed as vector valued modular forms which take values in so-called Weil representations. Accordingly, the first two chapters develop the theory of finite quadratic modules and associated Weil representations over number fields. This part might also be interesting for those who are merely interested in the representation theory of Hilbert modular groups. One of the main applications is the complete classification of Jacobi forms of singular weight over an arbitrary totally real number field.

Periods of Hilbert Modular Surfaces Jan 14 2021

Elliptic Curves, Hilbert Modular Forms and Galois Deformations Aug 09 2020 The notes in this volume correspond to advanced courses held at the Centre de Recerca Matemàtica as part of the research program in Arithmetic

Geometry in the 2009-2010 academic year. The notes by Laurent Berger provide an introduction to p-adic Galois representations and Fontaine rings, which are especially useful for describing many local deformation rings at p that arise naturally in Galois deformation theory. The notes by Gebhard Böckle offer a comprehensive course on Galois deformation theory, starting from the foundational results of Mazur and discussing in detail the theory of pseudo-representations and their deformations, local deformations at places l ≠ p and local deformations at p which are flat. In the last section,the results of Böckle and Kisin on presentations of global deformation rings over local ones are discussed. The notes by Mladen Dimitrov present the basics of the arithmetic theory of Hilbert modular forms and varieties, with an emphasis on the study of the images of the attached Galois representations, on modularity lifting theorems over totally real number fields, and on the cohomology of Hilbert modular varieties with integral coefficients. The notes by Lassina Dembélé and John Voight describe methods for performing explicit computations in spaces of Hilbert modular forms. These methods depend on the Jacquet-Langlands correspondence and on computations in spaces of quaternionic modular forms, both for the case of definite and indefinite quaternion algebras. Several examples are given, and applications to modularity of Galois representations are discussed. The notes by Tim Dokchitser describe the proof, obtained by the author in a joint project with Vladimir Dokchitser, of the parity conjecture for elliptic curves over number fields under the assumption of finiteness of the Tate-Shafarevich group. The statement of the Birch and Swinnerton-Dyer conjecture is included, as well as a detailed study of local and global root numbers of elliptic curves and their classification.

Noncommutative Geometry and Number Theory Feb 01 2020 In recent years, number theory and arithmetic geometry have been

enriched by new techniques from noncommutative geometry, operator algebras, dynamical systems, and K-Theory. This volume collects and presents up-to-date research topics in arithmetic and noncommutative geometry and ideas from physics that point to possible new connections between the fields of number theory, algebraic geometry and noncommutative geometry. The articles collected in this volume present new noncommutative geometry perspectives on classical topics of number theory and arithmetic such as modular forms, class field theory, the theory of reductive p-adic groups, Shimura varieties, the local L-factors of arithmetic varieties. They also show how arithmetic appears naturally in noncommutative geometry and in physics, in the residues of Feynman graphs, in the properties of noncommutative tori, and in the quantum Hall effect.

Hilbert Modular Forms Apr 28 2022 We study Hilbert modular forms in characteristic p and over p-adic rings. In the characteristic p theory we describe the kernel and image of the q-expansion map and prove the existence of filtration for Hilbert modular forms; we define operators U, V and Θ_χ and study the variation of the filtration under these operators. Our methods are geometric - comparing holomorphic Hilbert modular forms with rational functions on a moduli scheme with level-p structure, whose poles are supported on the non-ordinary locus. In the p-adic theory we study congruences between Hilbert modular forms. This applies to the study of congruences between special values of zeta functions of totally real fields. It also allows us to define p-adic Hilbert modular forms ``a la Serre'' as $p$-adic uniform limit of classical modular forms, and compare them with $p$-adic modular forms ``a la Katz'' that are regular functions on a certain formal moduli scheme. We show that the two notions agree for cusp forms and for a suitable class of weights containing all the

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Twisted Teichmüller Curves Dec 13 2020 These notes introduce a new class of algebraic curves on Hilbert modular surfaces. These curves are called twisted Teichmüller curves, because their construction is very reminiscent of Hirzebruch-Zagier cycles. These new objects are analyzed in detail and their main properties are described. In particular, the volume of twisted Teichmüller curves is calculated and their components are partially classified. The study of algebraic curves on Hilbert modular surfaces has been widely covered in the literature due to their arithmetic importance. Among these, twisted diagonals (Hirzebruch-Zagier cycles) are some of the most important examples.

Automorphy factors for a Hilbert modular group Jul 08 2020

Borcherds Products on O(2,l) and Chern Classes of Heegner Divisors Sep 09 2020 Around 1994 R. Borcherds discovered a new type of meromorphic modular form on the orthogonal group $O(2,n)$. These "Borcherds products" have infinite product expansions analogous to the Dedekind eta-function. They arise as multiplicative liftings of elliptic modular forms on $(SL)_2(R)$. The fact that the zeros and poles of Borcherds products are explicitly given in terms of Heegner divisors makes them interesting for geometric and arithmetic applications. In the present text the Borcherds' construction is extended to Maass wave forms and is used to study the Chern classes of Heegner divisors. A converse theorem for the lifting is proved.

Lectures on Hilbert Modular Surfaces Dec 05 2022

Hilbert Modular Surfaces Mar 28 2022

Lectures on Hilbert Modular Varieties and Modular Forms Oct 03 2022

Automorphic Forms and Geometry of Arithmetic Varieties Sep 29 2019 Automorphic Forms and Geometry of Arithmetic Varieties deals with the dimension formulas of various automorphic forms and the geometry of arithmetic varieties. The relation between two fundamental methods of obtaining dimension formulas (for cusp forms), the Selberg trace formula and the index theorem (Riemann-Roch's theorem and the Lefschetz fixed point formula), is examined. Comprised of 18 sections, this volume begins by discussing zeta functions associated with cones and their special values, followed by an analysis of cusps on Hilbert modular varieties and values of L-functions. The reader is then introduced to the dimension formula of Siegel modular forms; the graded rings of modular forms in several variables; and Selberg-Ihara's zeta function for p-adic discrete groups. Subsequent chapters focus on zeta

functions of finite graphs and representations of p-adic groups; invariants and Hodge cycles; T-complexes and Ogata's zeta zero values; and the structure of the icosahedral modular group. This book will be a useful resource for mathematicians and students of mathematics.