Cuspidal Divisor Class Groups Of Non Split Cartan Modular

Number Theory Related to Modular Curves: Momose Memorial Volume
Collected Papers II
Collected Papers I
JMSJ
Cyclotomic Fields II
Divisor Theory
Collected Papers V
“The” Divisor Class Group of a Krall Domain
The Arithmetic of Function Fields
Publicationes mathematicae
Cyclotomic Fields
The Divisor Class Group of a Krull Domain
Collected Papers IV
Basic Structures of Function Field Arithmetic
On the Semi-group of Effective Divisor Classes of an Algebraic Variety

Bulletin (new Series) of the American Mathematical Society
Collected Papers III
Mathematical Reviews
Iwasawa Theory 2012
Acta arithmetica
Bulletin of the American Mathematical Society
A Note on the Finiteness of Certain Cuspidal Divisor Class Groups
Documenta Mathematica
Cyclotomic Fields I and II
Mathematical Physics of Quantum Wires and Devices
Drinfeld Modules, Modular Schemes And Applications
Elementary Modular Iwasawa Theory
The Divisor Class Group of Krull Domian
Number Theory III
The Divisor Class Group of Ordinary and Symbolic Blow-ups
Modular Units
Algebraic Geometry
Arithmetic on Modular Curves
The Divisor Class Groups of Some Rings of Real-analytic Functions
Algebraic Number Theory and Diophantine Analysis

Modular Units
Algebraic Surfaces and Holomorphic Vector Bundles
The Mathematical Intelligencer
Exploring the Riemann Zeta Function
Reviews in Number Theory 1973-83

GWENDOLYN RILEY

Number Theory Related to Modular Curves: Momose Memorial Volume Springer Science & Business Media One of the most intriguing problems of modern number theory is to relate the arithmetic of abelian varieties to the special values of associated L-functions. A very precise conjecture has been formulated for elliptic curves by Birc~ and Swinnerton-Dyer and generalized to abelian varieties by Tate. The numerical evidence is quite encouraging. A weakened form of the conjectures has been verified for CM elliptic curves by Coates and Wiles, and recently strengthened by K. Rubin. But a general proof of the conjectures seems still to be a long way off. A few years ago, B. Mazur [26] proved a weak analog of these c- jectures. Let N be prime, and be a weight two newform for r 0 (N) . For a primitive Dirichlet character X of conductor prime to N, let i\ f (X) denote the algebraic part of L (f , X, 1) (see below). Mazur showed in [26] that the residue class of Af (X) modulo the "Eisenstein" ideal gives information about the arithmetic of Xo (N). There are two aspects to his work: congruence formulae for the values Af(X) , and a descent argument. Mazur's congruence formulae were extended to r 1 (N), N prime, by S. Kamienny and the author [17], and in a paper which will appear shortly, Kamienny has generalized the descent argument to this case.

Collected Papers II

Springer Science & Business Media

This volume contains the proceedings of the Barcelona-Boston-Tokyo Number Theory Seminar, which was held in memory of Fumiyuki Momose, a distinguished number theorist from Chuo University in Tokyo. Momose, who was a student of Yasutaka Ihara, made important contributions to the theory of Galois representations attached to modular forms, rational points on elliptic and modular curves, modularity of some families of Abelian varieties, and applications of arithmetic geometry to cryptography. Papers contained in this volume cover these general themes in addition to discussing Momose's contributions as well as recent work and new results.

Collected Papers I

American Mathematical Soc.

From the reviews:"The book...is a thorough and very readable introduction to the arithmetic of function fields of one variable over a finite field, by an author who has made fundamental contributions to the field. It serves as a definitive reference volume, as well as offering graduate students with a solid understanding of algebraic number theory the opportunity to quickly reach the frontiers of knowledge in an important area of mathematics...The arithmetic of function fields is a universe filled with beautiful surprises, in which familiar objects from classical number theory reappear in new guises, and in which entirely new objects play important roles. Goss'clear exposition and lively style make this book an excellent introduction to this fascinating field." MR 97i:11062

JMSJ Springer Science & Business Media

Serge Lang is not only one of the top mathematicians of our time, but also an excellent writer. He has made innumerable and invaluable contributions in diverse fields of mathematics and was honoured with the Cole Prize by the American Mathematical Society as well as with the Prix Carriere by the French Academy of Sciences. Here, 83 of his research papers are collected in four volumes, ranging over a variety of topics of interest to many readers.

Cyclotomic Fields II

Springer

Serge Lang is not only one of the top mathematicians of our time, but also an excellent writer. He has made innumerable and invaluable contributions in diverse fields of mathematics and was honoured with the Cole Prize by the American Mathematical Society as well as with the Prix Carriere by the French Academy of Sciences. Here, 83 of his research papers are collected in four volumes, ranging over a variety of topics of interest to many readers.

Divisor Theory World Scientific

A novel feature of the book is its integrated approach to algebraic surface theory and the study of vector bundle theory on both curves and surfaces. While the two subjects remain separate through the first few chapters, they become much more tightly interconnected as the book progresses. Thus vector bundles over curves are studied to understand ruled surfaces, and then reappear in the proof of Bogomolov's inequality for stable bundles, which is itself applied to study canonical embeddings of surfaces via Reider's method. Similarly, ruled and elliptic surfaces are discussed in detail, before the geometry of vector bundles over such surfaces is analysed. Many of the results on vector bundles appear for the first time in book form, backed by many examples, both of surfaces and vector bundles, and over 100 exercises forming an integral part of the text. Aimed at graduates with a thorough first-year course in algebraic geometry, as well as more advanced students and researchers in the areas of algebraic

geometry, gauge theory, or 4-manifold topology, many of the results on vector bundles will also be of interest to physicists studying string theory.
Collected Papers V
Springer Science & Business Media
This monograph on quantum wires and quantum devices is a companion vol ume to the author's Quantum Chaos and Mesoscopic Systems (Kluwer, Dordrecht, 1997). The goal of this work is to present to the reader the mathematical physics which has arisen in the study of these systems. The course which I have taken in this volume is to juxtapose the current work on the mathematical physics of quantum devices and the details behind the work so that the reader can gain an understanding of the physics, and where possible the open problems which re main in the development of a complete mathematical description of the devices. I have attempted to include sufficient background and references so that the reader can understand the limitations of the current methods and have direction to the original material for the research on the physics of these devices. As in the earlier volume, the monograph is a panoramic survey of the mathe matical physics of quantum wires and devices. Detailed proofs are kept to a min imum, with outlines of the principal steps and references to the primary sources as required. The survey is very broad to give a general development to a variety

of problems in quantum devices, not a specialty volume.
"The" Divisor Class Group of a Krall Domain Springer Science & Business Media
The series is aimed specifically at publishing peer reviewed reviews and contributions presented at workshops and conferences. Each volume is associated with a particular conference, symposium or workshop. These events cover various topics within pure and applied mathematics and provide up-to-date coverage of new developments, methods and applications.
The Arithmetic of Function Fields Springer Science & Business Media
Serge Lang is not only one of the top mathematicians of our time, but also an excellent writer. He has made innumerable and invaluable contributions in diverse fields of mathematics and was honoured with the Cole Prize by the American Mathematical Society as well as with the Prix Carriere by the French Academy of Sciences. Here, 83 of his research papers are collected in four volumes, ranging over a variety of topics of interest to many readers.
Publicationes mathematicae Walter de Gruyter
Serge Lang (1927-2005) was one of the top mathematicians of our time. He was born in Paris in 1927, and moved with his family to California, where he graduated from Beverly Hills High School in 1943. He subsequently graduated from California Institute of Technology in 1946, and received a doctorate from Princeton

University in 1951 before holding faculty positions at the University of Chicago and Columbia University (1955-1971). At the time of his death he was professor emeritus of Mathematics at Yale University. An excellent writer, Lang has made innumerable and invaluable contributions in diverse fields of mathematics. He was perhaps best known for his work in number theory and for his mathematics textbooks, including the influential Algebra. He was also a member of the Bourbaki group. He was honored with the Cole Prize by the American Mathematical Society as well as with the Prix Carrière by the French Academy of Sciences. These five volumes collect the majority of his research papers, which range over a variety of topics.

Cyclotomic Fields

Springer Science & Business Media

Kummer's work on cyclotomic fields paved the way for the development of algebraic number theory in general by Dedekind, Weber, Hensel, Hilbert, Takagi, Artin and others. However, the success of this general theory has tended to obscure special facts proved by Kummer about cyclotomic fields which lie deeper than the general theory. For a long period in the 20th century this aspect of Kummer's work seems to have been largely forgotten, except for a few papers, among which are those by Pollaczek [Po], Artin-Hasse [A-H] and Vandiver [Va]. In the mid 1950's, the theory of cyclotomic

fields was taken up again by Iwasawa and Leopoldt. Iwasawa viewed cyclotomic fields as being analogues for number fields of the constant field extensions of algebraic geometry, and wrote a great sequence of papers investigating towers of cyclotomic fields, and more generally, Galois extensions of number fields whose Galois group is isomorphic to the additive group of p-adic integers. Leopoldt concentrated on a fixed cyclotomic field, and established various p-adic analogues of the classical complex analytic class number formulas. In particular, this led him to introduce, with Kubota, p-adic analogues of the complex L-functions attached to cyclotomic extensions of the rationals. Finally, in the late 1960's, Iwasawa [Iw 1 I] . made the fundamental discovery that there was a close connection between his work on towers of cyclotomic fields and these p-adic L-functions of Leopoldt-Kubota.
The Divisor Class Group of a Krull Domain Springer Science & Business Media An introduction to abstract algebraic geometry, with the only prerequisites being results from commutative algebra, which are stated as needed, and some elementary topology. More than 400 exercises distributed throughout the book offer specific examples as well as more specialised topics not treated in the main text, while three appendices present brief accounts of some areas of current research. This book can thus be used as textbook

for an introductory course in algebraic geometry following a basic graduate course in algebra. Robin Hartshorne studied algebraic geometry with Oscar Zariski and David Mumford at Harvard, and with J.-P. Serre and A. Grothendieck in Paris. He is the author of "Residues and Duality", "Foundations of Projective Geometry", "Ample Subvarieties of Algebraic Varieties", and numerous research titles.

Collected Papers IV
Springer Science & Business Media

Thisseries is devoted to the publication of monographs, lecture resp. seminar notes, and other materials arising from programs of the OSU Mathemaical Research Institute. This includes proceedings of conferences or workshops held at the Institute, and other mathematical writings.

Basic Structures of Function Field Arithmetic World Scientific

Man sollte weniger danach streben, die Grenzen der mathe matischen Wissenschaften zu erweitern, als vielmehr danach, den bereits vorhandenen Stoff aus umfassenderen Gesichts punkten zu betrachten - E. Study Today most mathematicians who know about Kronecker's theory of divisors know about it from having read Hermann Weyl's lectures on algebraic number theory [We], and regard it, as Weyl did, as an alternative to Dedekind's theory of ideals. Weyl's axiomatization of what he calls "Kronecker's" theory is built-as Dedekind's theory was built-around unique factor ization. However, in presenting the theory in this way, Weyl overlooks one of Kronecker's most valuable ideas, namely, the idea that the objective of the theory is to define greatest com mon divisors, not to achieve factorization into primes. The reason Kronecker gave greatest common divisors the primary role is simple: they are independent of the ambient field while factorization into primes is not. The very notion of primality depends on the field under consideration-a prime in one field may factor in a larger field-so if the theory is founded on factorization into primes, extension of the field entails a completely new theory. Greatest common divisors, on the other hand, can be defined in a manner that does not change at all when the field is extended (see {sect}1.16). Only after he has laid the foundation of the theory of divisors does Kronecker consider factorization of divisors into divisors prime in some specified field

On the Semi-group of Effective Divisor Classes of an Algebraic Variety

Springer Science & Business Media

Serge Lang is not only one of the top mathematicians of our time, but also an excellent writer. He has made innumerable and invaluable contributions in diverse fields of mathematics and was honoured with the Cole Prize by the American Mathematical Society as well as with the Prix Carriere by the French

Academy of Sciences. Here, 83 of his research papers are collected in four volumes, ranging over a variety of topics of interest to many readers.

Bulletin (new Series) of the American Mathematical Society

Springer Science & Business Media

In the present book, we have put together the basic theory of the units and cuspidal divisor class group in the modular function fields, developed over the past few years. Let i) be the upper half plane, and N a positive integer. Let r(N) be the subgroup of SL (Z) consisting of those matrices == 1 mod N. Then r(N)\i) 2 is complex analytic isomorphic to an affine curve YeN), whose compactifi cation is called the modular curve X(N). The affine ring of regular functions on yeN) over C is the integral closure of C[j] in the function field of X(N) over C. Here j is the classical modular function. However, for arithmetic applications, one considers the curve as defined over the cyclotomic field Q(JIN) of N-th roots of unity, and one takes the integral closure either of Q[j] or Z[j], depending on how much arithmetic one wants to throw in. The units in these rings consist of those modular functions which have no zeros or poles in the upper half plane. The points of X(N) which lie at infinity, that is which do not correspond to points on the above affine set, are called the cusps, because of the way they look in a fundamental domain in the upper half plane. They generate a subgroup of the divisor class group, which turns out to be finite, and is called the cuspidal divisor class group.

Collected Papers III

Springer Science & Business Media

This second volume incorporates a number of results which were discovered and/or systematized since the first volume was being written. Again, I limit myself to the cyclotomic fields proper without introducing modular func tions. As in the first volume, the main concern is with class number formulas, Gauss sums, and the like. We begin with the Ferrero-Washington theorems, proving Iwasawa's conjecture that the p-primary part of the ideal class group in the cyclotomic Zp-extension of a cyclotomic field grows linearly rather than exponentially. This is first done for the minus part (the minus referring, as usual, to the eigenspace for complex conjugation), and then it follows for the plus part because of results bounding the plus part in terms of the minus part. Kummer had already proved such results (e.g. if p, (h; then p, (h;). These are now formulated in ways applicable to the Iwasawa invariants, following Iwasawa himself. After that we do what amounts to " Dwork theory," to derive the Gross Koblitz formula expressing Gauss sums in terms of the p-adic gamma function. This lifts Stickel berger's theorem p-adically. Half of the proof relies on a course of Katz, who had first obtained Gauss sums as

limits of certain factorials, and thought of using Washnitzer-Monsky cohomology to prove the Gross-Koblitz formula
Mathematical Reviews
Walter de Gruyter
Exploring the Riemann Zeta Function: 190 years from Riemann's Birth presents a collection of chapters contributed by eminent experts devoted to the Riemann Zeta Function, its generalizations, and their various applications to several scientific disciplines, including Analytic Number Theory, Harmonic Analysis, Complex Analysis, Probability Theory, and related subjects. The book focuses on both old and new results towards the solution of long-standing problems as well as it features some key historical remarks. The purpose of this volume is to present in a unified way broad and deep areas of research in a self-contained manner. It will be particularly useful for graduate courses and seminars as well as it will make an excellent reference tool for graduate students and researchers in Mathematics, Mathematical Physics, Engineering and Cryptography.

Iwasawa Theory 2012

Springer Science & Business Media

In 1988 Shafarevich asked me to write a volume for the Encyclopaedia of Mathematical Sciences on Diophantine Geometry. I said yes, and here is the volume. By definition, diophantine problems concern the solutions of equations in integers, or rational numbers, or various generalizations, such as finitely generated rings over Z or finitely generated fields over Q. The word Geometry is tacked on to suggest geometric methods. This means that the present volume is not elementary. For a survey of some basic problems with a much more elementary approach, see [La 9Oc]. The field of diophantine geometry is now moving quite rapidly. Out standing conjectures ranging from decades back are being proved. I have tried to give the book some sort of coherence and permanence by em phasizing structural conjectures as much as results, so that one has a clear picture of the field. On the whole, I omit proofs, according to the boundary conditions of the encyclopedia. On some occasions I do give some ideas for the proofs when these are especially important. In any case, a lengthy bibliography refers to papers and books where proofs may be found. I have also followed Shafarevich's suggestion to give examples, and I have especially chosen these examples which show how some classical problems do or do not get solved by contemporary in sights. Fermat's last theorem occupies an intermediate position. Al though it is not proved, it is not an isolated problem any more.

Acta arithmetica

Springer Science & Business Media

In his 1974 seminal paper 'Elliptic modules', V G Drinfeld introduced objects into the arithmetic geometry of global function fields which are nowadays known as 'Drinfeld Modules'. They have many beautiful analogies with elliptic curves and abelian varieties. They study of their moduli spaces leads amongst others to explicit class field theory, Jacquet-Langlands theory, and a proof of the Shimura-Taniyama-Weil conjecture for global function fields.This book constitutes a carefully written instructional course of 12 lectures on these subjects, including many recent novel insights and examples. The instructional part is complemented by research papers centering around class field theory, modular forms and Heegner points in the theory of global function fields.The book will be indispensable for everyone who wants a clear view of Drinfeld's original work, and wants to be informed about the present state of research in the theory of arithmetic geometry over function fields.