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Algebraic Number Theory and Related Topics 2010

edited by Masanari Kida, Noriyuki Suwa and Shinichi Kobayashi

July, 2012
Research Institute for Mathematical Sciences
Kyoto University
RIMS Kôkyûroku Bessatsu B32

Algebraic Number Theory
and
Related Topics 2010
December 6～10, 2010

edited by Masanari Kida, Noriyuki Suwa and Shinichi Kobayashi

July, 2012

Research Institute for Mathematical Sciences
Kyoto University, Kyoto, Japan

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Preface

The RIMS workshop “Algebraic Number Theory and Related Topics 2010” was held at Research Institute for Mathematical Sciences of Kyoto University from December 6 to December 10, 2010. The workshop was organized by Masanari Kida (University of Electro-Communications), Noriyuki Suwa (Chuo University) and Shinichi Kobayashi (Tohoku University).

The aim of the workshop was to overview recent developments in diverse branches of number theory: algebraic number theory, arithmetic geometry, automorphic forms and so on. The conference program included 27 talks in various areas of number theory and we had 161 participants during the conference. Two talks by Professors Arai and Ihara in the Wednesday session were dedicated to late Professor Fumiyuki Momose, who passed away on April 26, 2010.

This volume of RIMS Kōkyūroku Bessatsu edited by the three organizers is a collection of articles contributed by the invited speakers of the conference. They are divided into three categories: research announcements, survey articles and research articles for the convenience of reading and referring. Each paper was refereed by experts and is in final form.

The organizers would like to express their gratitude to everyone who contributed to the success of the conference and especially to the contributors and the anonymous referees of the articles of this volume who provided their excellent jobs on a tight schedule.

June 2012

Masanari Kida
Noriyuki Suwa
Shinichi Kobayashi
Program
Algebraic Number Theory and Related Topics 2010

Date December 6 (Mon), 2010 - December 10 (Fri), 2010
Place Room 420, Research Institute for Mathematical Sciences, Kyoto University

December 6 (Mon)
9:55 – 10:00 Introduction
10:00 – 10:50 Anna Cadoret (Univ. Bordeaux 1)
Representation over finite fields of etale fundamental groups of curves (joint work with Akio Tamagawa)
11:00 – 11:50 Kazuaki Miyatani (University of Tokyo)
Finiteness of crystalline cohomology of higher level
12:00 – 12:30 Manabu Yoshida (Kyushu University)
Takashi Suzuki (The University of Chicago)
Fontaine’s property ($P_m$) at the maximal ramification break
14:00 – 14:50 Shin Hattori (Kyushu University)
Ramification correspondence of finite flat group schemes of equal and mixed characteristic
15:00 – 15:50 Ahmed Abbes (CNRS)
Ramification and cleanliness
16:10 – 17:00 Takeshi Saito (University of Tokyo)
$\ell$-adic Riemann-Roch formula

December 7 (Tue)
10:00 – 10:50 Takashi Hara (University of Tokyo)
On non-commutative Iwasawa main conjecture for totally real fields
11:00 – 11:50 Tatsuya Ohshita (Kyoto University)
On the higher Fitting ideals of Iwasawa modules of class groups over real abelian fields
12:00 – 12:30 Yoshitaka Sasaki (Kinki University)
Poly-Euler numbers and the related $L$-function
14:00 – 14:50 Byoung Du Kim (Victoria University of Wellington)
Two-variable $p$-adic $L$-functions for modular forms at non-ordinary primes

15:00 – 15:50 Florian Sprung (Brown University)
The $p$-parts of Tate-Shafarevich groups of elliptic curves

16:10 – 17:00 Shinichi Kobayashi (Tohoku University)
The $p$-adic Gross-Zagier formula at supersingular primes

December 8 (Wed)

9:30 – 10:20 Takahiro Tsushima (University of Tokyo/Keio University)
Stable model of the modular curve $X_0(p^4)$

10:30 – 11:20 Keisuke Arai (Tokyo Denki University)
Galois images and modular curves

11:30 – 12:20 Yasutaka Ihara (Kyoto University)
Automorphy of Galois representations; where it is helpful and where not

December 9 (Thu)

10:00 – 10:50 Tsuyoshi Itoh (Chiba Institute of Technology)
Yasushi Mizusawa (Nagoya Institute of Technology)
Manabu Ozaki (Kinki University)
On the $\mathbb{Z}_p$ ranks of tamely ramified Iwasawa modules

11:00 – 11:50 Keiichi Komatsu (Waseda University)
Takashi Fukuda (Nihon University)
Takayuki Morisawa (Waseda University)
On $\lambda$-invariants of $\mathbb{Z}_l$-extensions over real abelian number fields with conductors of 2-powers

12:00 – 12:30 Akiko Ito (Nagoya University)
On the 3-divisibility of class numbers of certain quadratic fields

14:00 – 14:50 Ryoko Oishi-Tomiyasu (High Energy Accelerator Research Organization)
On a correspondence between the relative class group of a CM-field and equivalent classes of Pfister forms
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<td>Yifan Yang (National Chiao Tung University)</td>
<td>Cuspidal rational torsion subgroups of $J_1(N)$</td>
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