

## Preface

The RIMS workshop “Algebraic Number Theory and Related Topics 2012” was held at Research Institute for Mathematical Sciences, Kyoto University from December 3 to December 7, 2012. It was organized by Atsushi Shiho (University of Tokyo), Tadashi Ochiai (Osaka University) and Noriyuki Otsubo (Chiba University).

The aim of the workshop was to overview recent developments in diverse branches related to algebraic number theory. There were research talks on Iwasawa theory, arithmetic geometry, modular forms, anabelian geometry, algebraic cycles and so on. We also invited several speakers to give survey talks on recent developments in number theory. The conference program included 28 talks and we had 198 participants during the conference.

This volume of RIMS Kôkyûroku Bessatsu edited by the three organizers is a collection of articles contributed by speakers of the conference. They are classified into three categories following the views of the authors and the anonymous referees: research articles, research announcements and survey articles. Each paper has been refereed and is in its final form.

We would like to express our gratitude to participants, speakers and everyone who contributed to the success of the conference. We would also like to express our sincere gratitude to the authors and the anonymous referees of the articles of this volume for their excellent jobs on a tight schedule.

September 2014

Atsushi Shiho  
Tadashi Ochiai  
Noriyuki Otsubo

# Program

## Algebraic Number Theory and Related Topics 2012

**Date** December 3 (Mon) - December 7 (Fri), 2012

**Place** Room 420, Research Institute for Mathematical Sciences, Kyoto University

### December 3 (Mon)

- 10:00 – 10:15 Introduction
- 10:15 – 11:00 Tatsuya Ohshita (Kyoto University)  
Higher Fitting ideals of Iwasawa modules and Euler systems
- 11:15 – 12:20 Jiro Nomura (Keio University)  
On non-commutative Brumer-Stark conjecture
- 13:30 – 14:30 Tomokazu Kashio (Tokyo University of Science)  
A survey on Stark's conjectures and a result of Dasgupta-Darmon-Pollack (Survey Talk)
- 14:45 – 15:45 Somnath Jha (Osaka University)  
Fine Selmer group of Hida deformations
- 16:00 – 17:00 Masataka Chida (Kyoto University)  
Anticyclotomic  $p$ -adic  $L$ -functions for modular forms

### December 4 (Tue)

- 9:00 – 9:45 Tomoki Mihara (University of Tokyo)  
Singular homologies of non-archimedean analytic spaces and integrals along cycles
- 10:00 – 10:45 Kazuki Tokimoto (University of Tokyo)  
On the reduction modulo  $p$  of representations of a quaternion division algebra
- 11:00 – 12:00 Takahiro Tsushima (Kyushu University)  
Geometric realization of the local Langlands correspondence for representations of conductor exponent three

- 13:30 – 14:30 Seidai Yasuda (Osaka University)  
Recent progress on multiple zeta values and Deligne-Ihara conjecture (Survey Talk)
- 14:45 – 15:45 Chieh-Yu Chang (National Tsing Hua University)  
Linear independence of monomials of multizeta values in positive characteristic
- 16:00 – 17:00 Alan G. B. Lauder (University of Oxford/Kyushu University)  
Elliptic curves and  $p$ -adic  $L$ -functions

### December 5 (Wed)

- 9:00 – 9:45 Yohei Toda (Chuo University)  
On the cyclotomic twisted torus and some torsors
- 10:00 – 11:00 Akinari Hoshi (Rikkyo University)  
Rationality problem of quasi-monomial actions
- 11:15 – 12:15 Wen-Ching Winnie Li  
(Pennsylvania State University/National Tsing Hua University)  
The impact of computing on noncongruence modular forms
- 13:45 – 14:45 Naotake Takao (RIMS, Kyoto University)  
Oda's problem on universal monodromy representations and related topics
- 15:00 – 16:00 Shinichi Mochizuki (RIMS, Kyoto University)  
Invitation to inter-universal Teichmüller theory

### December 6 (Thu)

- 9:00 – 9:45 Tomohiro Nagasaka (Kyoto University)  
Cohomology calculus in logarithmic geometry
- 10:00 – 10:45 Tetsuya Uematsu (University of Tokyo)  
On the Brauer groups of diagonal cubic surfaces
- 11:00 – 12:20 Toshiro Hiranouchi (Hiroshima University)  
Milnor type  $K$ -groups attached to algebraic groups and additive higher Chow groups
- 13:30 – 14:30 Satoshi Mochizuki (Chuo University)  
A geometric presentation theorem

- 14:45 – 15:45 Yuki Kato (Tohoku Gakuin University)  
The Adams operation on group complete symmetric monoidal  $\infty$ -categories
- 16:00 – 17:00 Thomas Geisser (Nagoya University)  
Suslin homology, Albanese varieties and Rojtman's theorem

**December 7 (Fri)**

- 9:00 – 9:45 Yasuhiro Ishitsuka (Kyoto University)  
Complete intersections of two quadrics and Galois Cohomology
- 10:00 – 10:45 Megumi Takata (Kyushu University)  
On the Lefschetz trace formula for  $p^n$ -torsion etale cohomology
- 11:00 – 12:00 Noriko Hirata-Kohno (Nihon University)  
Polylogarithms revisited from the viewpoint of the irrationality
- 13:30 – 14:30 Kenichi Namikawa (National Taiwan University)  
On constructions of theta functions on  $\mathrm{GSp}(4)$  and its mod  $p$  nonvanishing
- 14:45 – 15:45 Takashi Taniguchi (Kobe University)  
Counting cubic extensions over a number field
- 16:00 – 17:00 Masami Ohta (Professor emeritus, Tokai University)  
Rational torsion in modular Jacobian varieties

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