

## Preface

The RIMS workshop “Algebraic Number Theory and Related Topics 2011” was held at Research Institute for Mathematical Sciences of Kyoto University from November 28 to December 2, 2011. The workshop was organized by Noriyuki Suwa (Chuo University), Atsushi Shiho (University of Tokyo) and Kanetomo Sato (Chuo 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 25 talks in various areas of number theory and we had 165 participants during the conference.

This volume of RIMS Kôkyûroku 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: survey articles, research announcements and research articles for the convenience of reading and referring. Each paper was refereed by experts and is in final form.

We remember that the Northeastward of Japan was hit by an extraordinary earthquake on 2011 March 11 and that, consequently, the Fukushima atomic power plants suffered most serious damage. Evidently it is very difficult to keep the situation under control. The disaster led the organizers to worry that the conference would not be held as usual in a year after the catastrophe. Nevertheless, our conference showed the consecutive activity of mathematics in Japan. Four speakers attended the conference from Tohoku University and young mathematicians gave interesting talks.

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.

November 2013

Noriyuki Suwa  
Atsushi Shiho  
Kanetomo Sato

# Program

## Algebraic Number Theory and Related Topics 2011

**Date** November 28 (Mon) - December 2 (Fri), 2011

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

### November 28 (Mon)

- 10:25 – 10:30 Introduction
- 10:30 – 11:20 Nobuo Tsuzuki (Tohoku University)  
Arithmetic families of Calabi-Yau varieties having a generalized hypergeometric function as a period integral
- 11:30 – 12:20 Fang-Ting Tu (Waseda University)  
Automorphic forms on Shimura curves and algebraic transformations of hypergeometric functions
- 14:00 – 14:50 Shun Ohkubo (University of Tokyo)  
The  $p$ -adic monodromy theorem in the imperfect residue field case
- 15:00 – 15:50 Valentina Di Proietto (University of Tokyo/Università di Padova)  
Kernel of the monodromy operator for semistable curves
- 16:10 – 17:00 Olivier Brinon (University of Tokyo/Université de Paris-Nord)  
Overconvergent Igusa tower and overconvergent Siegel forms

### November 29 (Tue)

- 9:30 – 10:20 Takao Yamazaki (Tohoku University)  
Voevodsky's motif and Weil reciprocity
- 10:30 – 11:20 Kensaku Kinjo (University of Tokyo)  
Hypergeometric series and arithmetic-geometric mean over 2-adic fields
- 11:30 – 12:20 Yoshinori Mishiba (Kyushu University)  
On  $v$ -adic periods of  $t$ -motives

- 14:00 – 14:50 Rin Sugiyama (Nagoya University)  
Tate conjecture for products of Fermat varieties of different degrees
- 15:00 – 15:50 Naoki Imai (RIMS, Kyoto University)  
Compactly supported cohomology and nearby cycle cohomology of open Shimura varieties of PEL type
- 16:10 – 17:00 Masaki Hanamura (Tohoku University)  
Relative algebraic correspondences and mixed motivic sheaves

**November 30 (Wed)**

- 9:30 – 10:20 Filippo A. E. Nuccio Mortarino Majno di Capriglio (Osaka University)  
Cyclotomic units and Greenberg conjecture
- 10:30 – 11:20 Abdul Hameed (NUCES, Lahore Campus),  
Toru Nakahara (NUCES, Peshawar Campus),  
Tsuyoshi Uehara (Saga University)  
On monogeneity of pure octic fields and maximal subfields of the  $m$ -th cyclotomic field
- 11:30 – 12:20 Fumiya Amano (Kyushu University)  
On a certain nilpotent extension of degree 64 and the 4-th multiple residue symbol

**December 1 (Thu)**

- 9:30 – 10:20 Keisuke Arai (Tokyo Denki University)  
Algebraic points on Shimura curves of  $\Gamma_0(p)$ -type
- 10:30 – 11:20 Tadahisa Nara (Tohoku University)  
On the Mordell-Weil groups of twist families of elliptic curves
- 11:30 – 12:20 Masao Ooi (Kyoto University)  
Differential Euler systems associated to symmetric squares of modular forms
- 14:00 – 14:50 Kentaro Nakamura (Hokkaido University)  
Iwasawa cohomology and Bloch-Kato exponential map for  $B$ -pairs

15:00 – 15:50 Yoshiyasu Ozeki (Kyushu University)  
Torsion representations of  $(\varphi, \hat{G})$ -modules

16:10 – 17:00 Cédric Pépin (Université de Leuven)  
Néron models of Picard varieties

**December 2 (Fri)**

10:00 – 10:50 Masatoshi Suzuki (University of Tokyo)  
On the zeros of Weng zeta functions for Chevalley groups

11:00 – 11:50 Yoshitaka Sasaki (Kinki University)  
Number theoretic and combinatorial properties of poly-Euler numbers

13:30 – 14:20 Yuya Matsumoto (University of Tokyo)  
On good reduction of some K3 surfaces

14:30 – 15:20 Daisuke Shiomi (Nagoya University)  
On the Jacobian of cyclotomic function fields

15:40 – 16:30 Yasuhiro Wakabayashi (RIMS, Kyoto University)  
On the cuspidalization problem for hyperbolic curves over finite fields

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