

## Workshop on arithmetic geometry at Tambara, 2017

May 22 Monday–25 Thursday, 2017

Tambara international seminar house, Tambara Kogen, Kamihotchi Cho, Numata city, Gumma prefecture

### May 22, Monday

- 11:22 arrival at Jomo Kogen station, Joetsu Shinkansen
- 12:40 arrival at the seminar house
- 14:30-15:30 Takeshi Saito (U. Tokyo): On the characteristic cycle of an  $\ell$ -adic sheaf
- 15:30-16:00 coffee break
- 16:00-17:00 T. Saito: continuation
- 18:00-20:00 dinner

### May 23, Tuesday

- 7:30-8:30 breakfast
- 9:00-10:30 Ippei Nagamachi (U Tokyo): V. G. Drinfeld, Two dimensional  $l$ -adic representations of the fundamental group over a curve over a finite field and automorphic forms on  $GL(2)$ , Amer. J. of Math 105 (1983) 85-114.
- 10:30-10:40 coffee break
- 10:40-12:10 I. Nagamachi : continuation
- 12:30-13:30 lunch
- 14:30-15:30 Kestutis Cesnavicius (UC Berkeley): The Manin constant in the semistable case
- 15:30-16:00 coffee break
- 16:00-17:00 Alex Youcis (UC Berkeley): The Langlands-Kottwitz method for Rapoport-Zink spaces of Hodge type
- 18:00-20:00 dinner

### May 24, Wednesday

- 7:30-8:30 breakfast
- 9:00-10:30 Sachio Ohkawa, Hiroyasu Miyazaki (U Tokyo): E. FRENKEL, D. GAITSGORY, D. KAZHDAN, K. VILONEN, Geometric realization of Whittaker functions and the Langlands conjecture, J. Amer. Math. Soc. 11, (1998), 451-484.
- 10:30-10:45 coffee break
- 10:45-12:10 S. Ohkawa, H. Miyazaki: continuation
- 12:30-13:30 lunch
- excursion
- 18:00-20:00 dinner

### May 25, Thursday

- 7:30-8:30 breakfast
- 8:45-10:15, 10:30-12:00 Kohei Yahiro (U Tokyo): FRENKEL, D. GAITSGORY, K. VILONEN, On the geometric Langlands conjecture, J. Amer. Math. Soc. 15, (2002), 367-417.
- 12:20 departure
- 14:21 leaving Jomo Kogen station

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The schedule is subject to last minute change depending on the weather condition.

organizers T. Saito, A. Shiho, T. Tsuji

## Abstracts

Kestutis Cesnavicius: The Manin constant in the semistable case

For an optimal modular parametrization  $J_0(n) \rightarrow E$  of an elliptic curve  $E$  over  $\mathbf{Q}$  of conductor  $n$ , Manin conjectured the agreement of two natural  $\mathbf{Z}$ -lattices in the  $\mathbf{Q}$ -vector space  $H^0(E, \Omega^1)$ . Multiple authors generalized his conjecture to higher dimensional newform quotients. We will discuss the semistable cases of the Manin conjecture and of its generalizations using a technique that establishes general relations between the integral  $p$ -adic étale and de Rham cohomologies of abelian varieties over  $p$ -adic fields.

Takeshi Saito: On characteristic cycles of  $\ell$ -adic sheaves

The characteristic cycle of an  $\ell$ -adic sheaf on a smooth variety over a perfect field is a  $\mathbf{Z}$ -linear combination of irreducible components of the singular support, defined by Beilinson as a closed conical subset of the cotangent bundle. It is an algebraic analogue of that studied by Kashiwara and Schapira in a transcendental setting. After briefly recalling the definition, we discuss its functorial property with respect to proper direct image.

Alex Youcis: The Langlands-Kottwitz method for Rapoport-Zink spaces of Hodge type.

Important in the comparison between local and global data coming from the Langlands correspondence, as well as the relation of these cohomologies to automorphic representations via the trace formula, is the ability to describe the trace of Frobenius and Hecke operators on the cohomology of Shimura varieties in terms of 'geometric data' in the form of integrals of distinguished 'test functions'. These test functions were heavily studied by Haines et. al, and an explicit description of such a test function was given by Scholze for Shimura varieties of PEL type. We extend these results to the case of Hodge type Shimura varieties.