Workshop on arithmetic geometry

April 14 (Tuesday) 11:00-17:15

Department of Mathematical Sciences, the University of Tokyo, Conference hall.

Program

11:00-12:00 Tsuji, Nearby cycles and $\mathcal{D}$-modules of log schemes in characteristic $p > 0$
13:30-14:30 Buyukboduk, Euler systems of rank r and Kolyvagin systems
15:00-16:00 Nekovar, On the method of Cornut and Vatsal in the theory of CM points,
16:15-17:15 Nekovar, Parity induced growth of Selmer groups of Hilbert modular forms over ring class fields

Abstracts

Takeshi TSUJI (Tokyo) Nearby cycles and $\mathcal{D}$-modules of log schemes in characteristic $p > 0$

For a log smooth scheme of semi-stable type over a log point of characteristic $p > 0$, we define nearby cycles as a single $\mathcal{D}$-module and study its properties. P. Berthelot proved that the cohomology of the nearby cycles coincides with log crystalline cohomology (Hyodo-Kato cohomology).

Kazim BUYUKBODUK (MPI Bonn) Euler systems of rank r and Kolyvagin systems

For a p-adic Galois representation T, I will devise an Euler system/Kolyvagin system machinery which as an input takes an Euler system of rank r (in the sense of Perrin-Riou), and gives a bound on the Bloch-Kato Selmer group in terms of an $r \times r$ determinant. I will give two fundamental applications of this refinement: The first with the (conjectural) Rubin-Stark elements; and the second with Perrin-Riou's (conjectural) p-adic L-functions.

Jan NEKOVAR (Jussieu) On the method of Cornut and Vatsal in the theory of CM points

Cornut and Vatsal developed a method for proving Mazur's conjecture on non-triviality of CM points in certain towers of ring class fields (and its generalization to CM points on Shimura curves over totally real number fields). The talk will describe an improvement of their method based on representation theory of $GL(2)$ and its inner forms over p-adic fields. This is a joint work with E. Aflalo.

Jan NEKOVAR (Jussieu) Parity induced growth of Selmer groups of Hilbert modular forms over ring class fields

This will be an overview of the methods and results of chapter 12 of my book "Selmer complexes", as well as of their recent improvements.