

Johannes Kepler Research Center for Mathematics

A Workshop of the DFG-Research Group 570
“Algebraic Cycles and L-Functions” Regensburg/Freiburg/Heidelberg

“Arithmetic and Motivic Algebraic Geometry”

Regensburg, February 14 – 18, 2011
Organizer: Alexander Schmidt (Heidelberg)

All lectures are held in Room M104

Coffee break: Room M103

Monday, 14 February 2011

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| 09:45 - 10:00 | Opening | |
| 10:00 - 11:00 | Scholbach, Jakob (Münster): | <i>Arakelov motivic cohomology</i> |
| 11:00 - 11:30 | <i>Coffee break</i> | |
| 11:30 - 12:30 | Stix, Jakob (Heidelberg): | <i>On the section conjecture over finite fields</i> |
| 12:30 - 14:00 | <i>Lunch time</i> | |
| 14:00 - 15:00 | Cisinski, Denis-Charles (Toulouse): | <i>Etale motives</i> |
| 15:00 - 15:30 | <i>Coffee break</i> | |
| 15:30 - 16:30 | Lebacque, Philippe (Besançon): | <i>L-functions in families</i> |

Tuesday, 15 February 2011

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| 10:00 - 11:00 | Szamuely, Tamás (Budapest): | <i>Around the Tate conjecture with integral coefficients</i> |
| 11:00 - 11:30 | <i>Coffee break</i> | |
| 11:30 - 12:30 | Harari, David (Orsay): | <i>The Brauer-Manin obstruction and Galois hypercohomology</i> |
| 12:30 - 14:00 | <i>Lunch time</i> | |
| 14:00 - 15:00 | Esnault, Hélène (Essen): | <i>Infinitesimal cycles</i> |
| 15:00 - 15:30 | <i>Coffee break</i> | |
| 15:30 - 16:30 | Kerz, Moritz (Essen): | <i>Deformation of algebraic cycle classes</i> |

Wednesday, 16 February 2011

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| 09:00 - 10:00 | Witte, Malte (Heidelberg): | <i>A non-commutative Iwasawa main conjecture for function fields</i> |
| 10:00 - 10:30 | <i>Coffee break</i> | |
| 10:30 - 11:30 | Wendt, Matthias (Freiburg): | <i>\mathbb{A}^1-homotopy theory and algebraic groups</i> |
| 11:30 - 12:00 | <i>Coffee break</i> | |
| 12:00 - 13:00 | Quick, Gereon (Harvard): | <i>Galois actions on etale homotopy types</i> |
| 15:00 | Excursion “Altes Rathaus” | |

Thursday, 17 February 2011

- 10:00 - 11:00 Wingberg, Kay (Heidelberg): *On the theory of ends of a pro- p group*
11:00 – 11:30 *Coffee break*
11:30 – 12:30 Maire, Christian (Besançon): *On some arithmetic questions along a p -adic Lie extension*
12:30 – 14:00 *Lunch time*
14:00 – 15:00 Geißer, Thomas (Nagoya): *Duality and class field theory of schemes*
15:00 – 15:30 *Coffee break*
15:30 – 16:30 Jannsen, Uwe (Regensburg): *A new p -adic cohomology theory in characteristic p*
16:30 – 17:00 *Coffee break*
17:00 – 18:00 Jossen, Peter (Regensburg): *On the Mumford-Tate conjecture for 1-motives*

19:00 – Conference Dinner at restaurant “Leerer Beutel”

Friday, 18 February 2011

- 09:00 – 10:00 Bräunling, Oliver (Nottingham): *Two-dimensional idèles with cycle module coefficients*
10:00 – 10:30 *Coffee break*
10:30 – 11:30 Derenthal, Ulrich (LMU München): *Universal torsors and rational points on del Pezzo surfaces*
11:30 – 12:00 *Coffee break*
12:00 – 13:00 Gille, Stefan (LMU München): *On Chow motives (with finite coefficients) of geometrically rational surfaces*

Abstracts

Denis-Charles Cisinski: Etale motives

For any noetherian excellent scheme X , there is a triangulated category of étale motives over X : the rational part of this construction is strongly related with the Adams grading of algebraic K -theory (and thus gives the expected motivic cohomology for regular schemes), while, according to Suslin-Voevodsky's rigidity theorem, its torsion part coincides essentially with the usual theory of étale sheaves, as defined and studied by Artin and Grothendieck. From this point of view, ℓ -adic realization functors may be seen as homotopy ℓ -completion functors. If time permits, we will see how some conjectural finiteness properties of étale motives with respect to ℓ -completion would lead to comparison theorems between ℓ -adic cohomology and p -adic cohomology in characteristic p .

Hélène Esnault: Infinitesimal cycles (joint work with Moritz Kerz and Spencer Bloch)

We determine (in unequal char.) the obstruction to the lifting as a pro-system of cohomology classes in the Zariski cohomology of the Milnor K -sheaf of the crystalline class of an algebraic cycle.

David Harari: The Brauer-Manin obstruction and Galois hypercohomology

Let X be a smooth variety defined over a number field k . We will explain how a reinterpretation (due to T. Szamuely and myself) of the so-called Brauer-Manin pairing on X yields a generalisation of Colliot-Thelene and Sansuc's descent theory to the case when X is not necessarily proper (joint work with A. N. Skorobogatov).

Peter Jossen: On the Mumford-Tate conjecture for 1-motives

To a variety over a number field k one can associate various cohomology objects, in particular mixed Hodge structures (once a complex embedding of k is chosen) and ℓ -adic Galois representations (once an algebraic closure of k is chosen). In my talk I will formulate a conjecture which relates these objects, and show how in the case of cohomology in degree 1 this conjecture is equivalent to the classical Mumford-Tate conjecture for abelian varieties.

Jakob Stix: On the section conjecture over finite fields

Grothendieck's section conjecture in anabelian geometry suggests to use splittings of the fundamental group exact sequence to study rational points. Over number fields, splittings which locally come from rational points are related to adelic points which survive all finite torsor obstructions. We will discuss in the talk how badly the analogue of the section conjecture fails over finite fields.