Number Theory Days 2017

June 2nd – 3rd, 2017 - EPF Lausanne – room CE 2

14th edition

Timothy Browning (University of Bristol)

Bruno Klingler (Université Paris Diderot)

Lilian Matthiesen (KTH - Royal Inst. of Technology)

Dinakar Ramakrishnan (Caltech)

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Number Theory Days 2017

Saturday June 3nd, 2017 at 11h00 (room CE 2)

Dinakar Ramakrishnan (Caltech)

Rational Points on Picard modular surfaces, and non-vanishing of L-values.

This talk will describe ongoing joint work, and some progress, with M. Dimitrov on the expected paucity of rational point on Picard modular surfaces. There is an analytic component which involves non-vanishing of L-values and a geometric component involving intersections.

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Friday June 2nd, 2017 at 15h15 (room CE 2)

Timothy D. Browning (University of Bristol)

Many cubic surfaces contain rational points

I will discuss the arithmetic of cubic surfaces and show how the arithmetic of Mordell curves allows one to say something unconditional about the existence of rational points on a family of cubic surfaces.

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Friday June 2nd, 2017 at 17h00 (room CE 2)

Bruno Klingler (Université Paris Diderot)

Hodge theory and atypical intersections

Given a smooth family of quasiprojective complex varieties $f:X \rightarrow S$, one would like to understand the locus of points $s \in S$ whose fiber X_s admits more Hodge classes than the very general fiber. In this talk I will describe a general conjecture (and some results) concerning this locus in terms of exceptional intersections. When S is a Shimura variety and $f: X \rightarrow S$ a standard family of Abelian varieties one recovers the Zilber-Pink conjectures, in particular the Andr\'e-Oort conjecture.

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Saturday June 3rd, 2017 at 09h30 (room CE 2)

Lilian Matthiesen (KTH)

Multiplicative functions and rational points in families of varieties

(Joint work with Daniel Loughran.) Given a family of varieties over Q, we consider the problem of counting the number of varieties in this family which have a rational point. For suitable families over P^1, we will show how to obtain correct order lower bounds for this counting problem and thereby answer a question of Serre.

The proof involves multiplicative functions and uses techniques from additive combinatorics and arithmetic geometry.

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