ARITHMETIC, CYCLES, MOTIVES AND ALGEBRAIC GEOMETRY

PROGRAM

Monday 18:

9:30 - 10:30	Algebraic cycles and Hodge theory I James D. Lewis
10:45 - 11:45:	Rational curves on Calabi-Yau Manifolds I Xi Chen
12:00 - 13:00	From ordinary cohomology to motivic cohomology of real varieties I Paulo Lima-Filho
16:00 - 17:00	Algebraic cycles and Hodge theory II James D. Lewis

Tuesday 19:

9:30 - 11:30:	From ordinary cohomology to motivic cohomology of real varieties II Paulo Lima-Filho
10:45 - 11:45	Algebraic cycles and Hodge theory III James D. Lewis
12:00 - 13:00	Heights, rational points on varieties over function fields, and derivations I Henri Gillet
16:00 - 17:00	Heights, rational points on varieties over function fields, and derivations II Henri Gillet

Wednesday 20:

9:30 - 10:30	Rational curves on Calabi-Yau Manifolds II Xi Chen
10:45 - 11:45	Rational curves on Calabi-Yau Manifolds III Xi Chen
12:00 - 13:00	Heights, rational points on varieties over function fields, and derivations III Henri Gillet
16:00 - 17:00	From ordinary cohomology to motivic cohomology of real varieties III Paulo Lima-Filho

Thursday 21:

9:30 - 10:30:	A study of mirror symmetry through log mixed Hodge theory I Sampei Usui
10:45 - 11:45	Chow motives (with integral coefficients), Rost nilpotence and applications I Stefan Gille
12:00 - 13:00	A crystalline criterion for good reduction on semistable K3-surfaces over a p-adic field Rogelio Pérez Buendía
16:00 - 17:00	Voevodsky motivic complexes and regulators Paulo Lima-Filho

Friday 22:

9:30 - 11:30:	A study of mirror symmetry through log mixed Hodge theory II Sampei Usui
10:45 - 11:45	Chow motives (with integral coefficients), Rost nilpotence and applications II Stefan Gille
12:00 - 13:00	Naive boundary strata and nilpotent orbits Matt Kerr
16:00 - 17:00	A non-trivial cycle on the generic abelian fourfold Rusell Aaron Quiñones Estrella

Saturday 23:

9:30 - 11:30:	A study of mirror symmetry through log mixed Hodge theory III Sampei Usui
10:45 - 11:45	The motivic Zeta function Carlos Pompeyo-Gutiérrez
12:00 - 13:00	A (very) special case of Bombieri-Lang for varieties over a function field of characteristic p Henri Gillet

Abstracts

Title: Rational curves on Calabi-Yau manifolds
Speaker: Xi Chen
Mini course

Abstract: Calabi-Yau manifolds are complex manifolds with trivial canonical bundles similar to abelian varieties. But unlike abelian varieties, they contain rational curves. These rational curves play important roles in many problems. In these lectures, I'll talk about the existence of rational curves and their application to some Hodge theoretical problems on CY manifolds.

Title: "Heights, rational points on varieties over function fields, and derivations"
Speaker: Henri Gillet
Mini course and lecture

Abstract: The the course will be a basic introduction to the Mordell conjecture (including Grauert's proof in the function fields case), and the Bombieri-Lang conjecture for varieties over function fields in both characteristic zero, and characteristic $p > 0$. In the talk I will report on some recent work on the characterisitc $p > 0$ case.

Title: Algebraic Cycles and Hodge Theory, I, II and III
Speaker: James D. Lewis
Mini course

Abstract: The goal of these lectures is to explain some recent work on the Beilinson-Hodge conjecture, and the impact of the Bloch-Kato theorem on this subject. The first two lectures will mostly cover background material (mixed Hodge structures, Milnor sheaves, algebraic de Rham cohomology, Deligne(-Beilinson) cohomology, Beilinson rigidity, absolute Hodge classes), followed by new developments in Lecture III.

Title: Naive boundary strata and nilpotent orbits
Speaker: Matt Kerr
Lecture

Abstract: I will discuss ongoing work with G. Pearlstein on giving a limiting Hodge-theoretic interpretation to the topological boundary strata of Mumford-Tate domains inside their compact dual, including cases where this is not possible. I'll start by explaining our previous construction of Hodge-theoretic boundary components, which is quite different and related to the Kato-Usui partial compactification story.

Title: A non-trivial cycle on the generic abelian fourfold
Speaker: Russel Aaron Quiñones Estrada
Lecture

Abstract: In the talk we give the construction of a non-trivial element of the higher Griffiths group $Griff^{3,2}(A^4)$ for the generic abelian fourfold A^4. Codimension 3 means "curves" in A^4, so the key idea is to use the fact that A^4 can be realized as a generalized Prym variety wich contais in a natural way some curve.

Title: A study of mirror symmetry through log mixed Hodge theory
Speaker: Sampei Usui
Three lectures

Abstract: We hope to understand the Hodge theoretic aspect of mirror symmetry in the framework of the fundamental diagram of log mixed Hodge theory. This work is a first step. We give a formulation of mirror theorem for quintic threefold and its mirror as the coincidence of log period maps with specified sections under the mirror map. Since a variation of Hodge structure on a punctured disc extends over the puncture to a log Hodge structure, we can work on and over the boundary point and we can observe clearly in high-resolution the behavior of Z-structure over the boundary point. This is an advantage of log Hodge theory.