

SCHEDULE WEEK 4

Time	Monday 6/5	Tuesday 7/5	Wednesday 8/5	Thursday 9/5	Friday 10/5	Saturday 11/5
8h			Holiday			Week-end
9h						
10h						
11h	Harpez Darboux	Harpez Darboux		Voisin College de France		
12h						
13h						
14h						
15h	Schindler Jussieu	Demarche Orsay		Public lecture	Loughran Darboux	
16h	Tea	Tea		Tea	Tea	
17h	Loughran Darboux			Streeter		
18h						
19h						
20h						

Yonatan HARPAZ: *Rational points on elliptic fibrations (after Swinnerton-Dyer)*

In this series of four lectures we will describe an approach, originally due to Swinnerton-Dyer and further developed by several authors, to the study of rational points on surfaces fibred into curves of genus 1, and more generally, on pencils of torsors under abelian varieties. Under suitable hypotheses (and possibly assuming powerful number theoretical conjectures), one can use this method to show that if the Brauer-Manin obstruction controls the Hasse principle for most of the fibers

Date: Monday, May 6th–Sunday, May 12th.

in the fibration, then the same holds for the total space. Results obtained in this manner are currently some of the only evidence for whether the Brauer-Manin obstruction controls the Hasse principle for K3 surfaces, for example.

Dan LOUGHRAN: *Rational points in families of varieties*

The first couple of lectures will consist of a general introduction to some algebro-geometric techniques in arithmetic geometry, such as the Lang-Weil estimates, Hensel's lemma and the Chebotarev density theorem for finitely generated extensions of the rationals, with the common theme being the importance of models and schemes. We will also cover basic terminology and techniques from the fibration method (split/non-split fibres and local solubility).

We will then use these techniques to prove the main theorem from the paper: Loughran, Smeets - *Fibrations with few rational points*.

This theorem says that for families of varieties satisfying certain geometric conditions, 100% of the varieties in the family have no rational point.

The intended audience is PhD students in arithmetic geometry.

Sam STREETER: *Hilbert Property for Double Conic Bundles and del Pezzo Varieties*

In this talk we introduce the Hilbert property as a geometric notion for describing the abundance of rational points on a variety. We will indicate its connections to the inverse Galois problem and show that it is satisfied by surfaces with two distinct conic fibrations. In particular, we will verify the Hilbert property for certain del Pezzo surfaces and their higher-dimensional analogues, del Pezzo varieties.