

Mini-Course on **Rational Points on Kummer Varieties and Swinnerton-Dyer's method**

Speaker : Adam Morgan

Abstract : These lectures are designed to serve as an introduction to Swinnerton-Dyer's descent fibration method. This is a versatile method for studying the Hasse principle and Brauer–Manin obstruction for certain classes of varieties, and works well in situations where the existence of rational points can be related to the existence of rational points on families of torsors under abelian varieties. Following Swinnerton-Dyer's original work, the method has been developed by Colliot-Thélène, Skorobogatov, Harpaz, Wittenberg and others, and examples of varieties it has been successfully applied to include K3 surfaces, cubic surfaces and quartic del Pezzo surfaces. We will primarily illustrate the method in the special case of K3 Kummer surfaces. Time permitting, I will also touch on degree 4 del Pezzo surfaces, which will be discussed in more detail in later lectures of Lyczak. A sizeable portion of the course will be dedicated to the study of 2- and 4-Selmer groups in quadratic twist families, which forms a large part of the technical input to the results mentioned above.

Schedule :

Wednesday 8th April 2:30 to 4:30 pm

Friday 10th April 11am to 1pm