

Arithmetic and Geometry: Three conjectures about dense sets of points

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Abstract: Three conjectures will be studied: Manin-Mumford, André-Oort and the Hecke Orbit conjecture. We will show that these statements (in arithmetic algebraic geometry) are very similar: all three study a set of points in an algebraic variety and we ask what the closure is of this set. In the first part of my talk I will discuss the basic concepts used: abelian varieties and moduli spaces. I will give examples and some easy proofs. Some of the aspects will be illustrated with the theory of elliptic curves. If you want to obtain a general impression about these things, the first half of the talk will provide this. In the second part I will discuss some more technical details, and an application. The proof of the Hecke Orbit conjecture is joint work with Ching-Li Chai, using a result by Chia-Fu Yu.

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