

Speaker: Ziyang Gao

Title: Generic positivity of the Beilinson-Bloch height of Gross-Schoen and Ceresa cycles

Abstract: Given an algebraic curve defined over a number field, one can define the Néron-Tate height on the Jacobian and prove its positivity. This height pairing and its positivity play important roles in the proof of the Mordell-Weil theorem, in Vojtas proof of the Mordell conjecture, and in the formulation of the BSD conjecture. The Jacobian can be seen, via the Abel-Jacobi map, as the moduli space of 0-cycles of degree 0 on the algebraic curve.

The analogue for higher cycles was studied by Weil, Griffiths, Beilinson, and Bloch. In particular in the 1980s, Beilinson and Bloch independently proposed a conditional definition of heights for arbitrary homologically trivial cycle. The positivity of their heights, as conjectured by Beilinson and Bloch, is widely open.

In this talk, I will report a recent joint work with Shouwu Zhang about a generic positivity for the Gross-Schoen and Ceresa cycles of curves of genus at least 3. These are the simplest situation where the Beilinson-Bloch heights are unconditionally defined.