

## Kolyvagin's Conjecture and Iwasawa Theory

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Let  $E$  be a rational elliptic curve and  $p$  be an odd prime of good ordinary reduction for  $E$ . In 1991 Kolyvagin conjectured that the system of cohomology classes derived from Heegner points on the  $p$ -adic Tate module of  $E$  over an imaginary quadratic field  $K$  is non-trivial. I will talk about joint work with A. Burungale, F. Castella, and C. Skinner, where we prove Kolyvagin's conjecture in the cases where an anticyclotomic Iwasawa Main Conjecture for  $E/K$  is known. Moreover, our methods also yield proof of a refinement of Kolyvagin's conjecture expressing the divisibility index of the Heegner point Kolyvagin system in terms of the Tamagawa numbers of  $E$ . One of the proof's key ingredients, which I will focus on during the talk, is a refinement of the Kolyvagin system argument for (anti-cyclotomic) twists of  $E$  studied by Jan Nekovář.

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