

## UBC Number Theory Seminar: December 20, 2021

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**Speaker:** Abbey Bourdon (Wake Forest University)

**Title:** Torsion Subgroups of CM Elliptic Curves in Degree  $2p$

**Abstract:** A common classification problem is to identify the groups which arise as the torsion subgroup of an elliptic curve defined over any number field of a fixed degree. That only finitely many such groups occur in this context is a consequence of Merel's Uniform Boundedness Theorem. However, for certain families of elliptic curves—such as those with complex multiplication (CM)—recent advances have allowed us to move beyond a fixed-degree classification to glimpse the behavior of torsion points over infinitely many degrees of a restricted form. In this talk, I will discuss recent work with Holly Paige Chaos which characterizes the groups that arise as torsion subgroups of CM elliptic curves defined over number fields of degree  $2p$  where  $p$  is prime. Here, a classification in the strongest sense is tied to determining whether there exist infinitely many Sophie Germain primes.