Abstract:
This will be a mainly expository talk about some recent applications of number theory to topology. The crux of these applications is the construction of a cohomology theory called topological modular forms (TMF) out of the moduli of elliptic curves. I’ll explain what TMF is, what we have been doing with it, and what we'd still like to know; I’ll also discuss more recent attempts to extend the theory using level structures, higher-dimensional abelian varieties, and K3 surfaces. Time permitting, I’ll talk about my work with Dominic Culver on some partial number-theoretic interpretations of TMF co-operations.