Topology Seminar

Vesna Stojanoska

of MIT will be speaking on

Duality for Topological Modular Forms

on September 12 at 4:30 in
MIT Room 2-131

It has been observed that certain localizations of the spectrum of topological modular forms tmf are self-dual (Mahowald-Rezk, Gross-Hopkins). We provide an integral explanation of these results that is internal to the geometry of the (compactified) moduli stack of elliptic curves $\mathcal{M}_{\mathrm{ell}}$ yet is only true in the derived setting. When p is inverted, choice of level-p-structure for an elliptic curve provides a geometrically well-behaved cover of $\mathcal{M}_{\mathrm{ell}}$, which allows one to consider tmf as the homotopy fixed points of tmf(p), topological modular forms with level-p-structure, under a natural action by $\mathrm{GL}_2(\mathbb{Z}/p)$. Specializing to $p = 2$ or $p = 3$ we obtain that as a result of Grothendieck-Serre duality, tmf(p) is self dual. The vanishing of the associated Tate spectra then makes tmf itself Anderson self-dual.