DALHOUSIE MATHEMATICS COLLOQUIUM

Monday Jun 8 2020, 3:30 pm, using Zoom

Speaker: Theo Johnson-Freyd
(Perimeter Institute)

Phases of SQFTs

A "phase" of quantum systems (of some type) is a connected component in the space of all quantum systems (of that type). For example, phases of minimally-supersymmetric quantum mechanics models (1D QFTs) are perfectly classified by K-theory, leading to myriad applications in mathematics and physics. I will report on what we do (and don't) know about phases of minimally-supersymmetric 2D QFTs. These are expected to be classified by the generalized cohomology theory of Topological Modular Forms (TMF). In particular, I will describe a new invariant of SQFTs called the "secondary Witten genus" which, on the one hand, sees torsion in TMF, and, on the other hand, connects directly to mock modular forms, and thereby to the modern "umbral" moonshine of Niemeier lattices and K3 surfaces.