

# Musings on topological modular forms and moonshine

Theo Johnson-Freyd

Dalhousie University

## **Abstract:**

The character of a (rational, unitary) VOA is expected to refine to a vector-valued Topological Modular Form. This expected lifting implies, among other things, nontrivial divisibility statements on the character as well as torsion refinements of the character. Many mathematical details remain open, including about the very definition of "vector-valued Topological Modular Form." Particularly interesting is the question of how exactly to control cuspidal behaviour; guidance comes from attempting to conjecture topological refinements of moonshine-type statements. I will describe some ongoing conversations with Lennart Meier and Mayuko Yamashita on this subject.