MATHEMATICAL PHYSICS SEMINAR, KATRINA BARRON, NOTRE DAME, BRNG 1255

Location:BRNG 1255
Time:Tue, March 26, 1:30 PM - 2:30 PM

Title: Irrational vertex operator algebras and graded pseudo-traces for indecomposable non simple modules

Abstract: To construct a Conformal Field Theory (CFT) one needs a category of modules for a vertex operator algebra (VOA) with certain ``nice" properties. If the VOA satisfies a certain finiteness condition, called C_2-cofinite, and has semi-simple representation theory (is rational), then its category of N-gradable modules forms a Modular Tensor Category (MTC) in which the graded traces are q-series that form an invariant space under the action of the modular group SL2(C). In 2004, Miyamoto proved that much of this structure carries through for C_2-cofinite irrational VOAs if one includes graded ``pseudo-traces" in addition to the graded traces. However very few such C_2-cofinite irrational VOAs have been constructed, and the machinery necessary to carry out Miyamoto's construction is very involved. We will present a setting in which the C_2-cofiniteness of V is not necessary, graded pseudo-traces are easily defined, and they satisfy linearity, symmetry, and the logarithmic derivative property.

We show that this setting has interesting applications to, for instance, the two most common VOAs, namely the Heisenberg and Virasoro VOAs.