

Title: Borcherds-Kac-Moody Algebras, Moonshine VOAs, and String Theory

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Abstract: <p>In this talk we will review our physical proposal, with D. Persson and R. Volpato, to understand the genus zero property of monstrous moonshine. The latter was proven by Borcherds in 1992 by brute-force computation but has since resisted a conceptual understanding. We embed the Monster VOA of Frenkel-Lepowsky-Meurman into a heterotic string compactification and use physical arguments, i.e. T-dualities and decompactification limits, to understand the genus zero property. We find that the Monster Lie algebra (a Generalized, or Borcherds-Kac-Moody algebra) acts as a sort of "algebra of BPS states". We also sketch an analogous proposal, with S. Harrison and R. Volpato, for Conway moonshine using the type II string. Along the way we construct a new super Borcherds-Kac-Moody algebra on which the Conway group acts faithfully and prove its (twisted) denominator identities, which should be identified with BPS state counts in our string theory. </p>

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