Different faces of Borcherds products: new applications in algebraic geometry and Lie algebras

Abstract:

The Borcherds modular form in 26 variables and the corresponding Fake Monster Lie algebra play a crucial role in the Borcherds solution of the moonshine conjecture. In this talk we discuss twenty-four new representations of this important function and some applications. First, we answer to the old question of Igor Frenkel (1983) of a possible link between affine and hyperbolic Kac-Moody algebras and we show how to construct a large new class of Lorentzian Kac-Moody algebras. Then we apply new formulae for Borcherds function in order to study modular varieties of orthogonal type, i.e. the moduli spaces of polarized (or lattice polarized) K3 surfaces and moduli spaces of polarized holomorphic irreducible symplectic varieties.

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