

Algebra/Topology Seminar

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CLASSIFICATION OF SIMPLE VERTEX ALGEBRAS IN RANK 24

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ABSTRACT. An interesting classical problem is the classification of integral lattices up to isomorphism. It turns out that self-dual (even, positive definite) integral lattices exist only for rank a multiple of 8, and that low rank examples are related to many beautiful, highly symmetrical objects—such as the E_8 lattice in rank 8, and the 24 Niemeier lattices in rank 24.

The problem for lattices generalizes very naturally to the classification of simple vertex algebras. I will speak about recent progress (joint work with N. Scheithauer and S. Moeller) on the classification of these algebras in rank 24, which are conjecturally 71 in number. More precisely, I will explain our determination of the fusion rings of fixed-point vertex algebras, and the classification of possible affine structures on simple vertex algebras in rank 24.