DEPARTMENT OF MATHEMATICS
Illinois State University

Online ISU Algebra Seminar

Date and Time: March 4, 2021 from noon to 12:50 pm.
Speaker: Jethro van Ekeren, Ph. D. (Universidade Federal Fluminense, Brazil)

Title: Kac's very strange formula, the Leech lattice, and Schellekens' list

Abstract: If V is a holomorphic vertex algebra of central charge 24 then its weight one space V_1 is known to be a reductive Lie algebra which is either trivial, abelian of dimension 24 (in which case V is the Leech lattice vertex algebra) or else one of 69 semisimple Lie algebras first determined by Schellekens in 1993, via reduction to a set of difficult integer programming problems. In this talk I will describe how Kac's very strange formula, together with bounds on the dimensions of weight one spaces of orbifold vertex algebras (recently obtained by Moeller and Scheithauer) can be used to show that all holomorphic vertex algebras of central charge 24 and nontrivial weight one space are orbifolds of the Leech lattice algebra. The automorphism group of the latter algebra is known and so, with a little more work, one may recover Schellekens' result this way. (This is joint work with C.H. Lam, S. Moeller and H. Shimakura.)

About Speaker: Jethro van Ekeren is an assistant professor of mathematics at the Universidade Federal Fluminense, Brazil. His research interests are in representation theory of infinite dimensional Lie algebras, vertex and chiral algebras, and modular forms. Professor Jethro van Ekeren received his Ph.D. in mathematics from MIT under the direction of Victor Kac.

Zoom Meeting Information

Topic: ISU Algebra Seminar
Time: Mar 4, 2021 12:00 PM Central Time (US and Canada)

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