

Orbifolds and the Very Strange Formula

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A vertex algebra is called holomorphic if has no irreducible modules other than itself. It is well known that the rank of such a vertex algebra can only be a multiple of 8, and that there is one example of rank 8 (related to the E_8 lattice) and two examples of rank 16. It has essentially been proved that there are 71 examples of rank 24, but the proof of this classification result is heavily computational and is spread across many articles written over a period of decades. In this talk I will describe work in which we find a surprisingly simple proof that the 71 holomorphic vertex algebras of rank 24 may be obtained uniformly as orbifolds of the Leech lattice. (Joint work with Ching-Hung Lam, Sven Moeller, and Hiroki Shimakura.)