

# On the Classification of Holomorphic Vertex Operator Algebras of Central Charge 24

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**Abstract:** The notion of vertex operator algebras (VOA) is essentially the same as the chiral algebras in conformal field theory (CFT). Given a rational VOA (i.e., the module category is finite and semi-simple), one can construct a CFT by using a pair of isomorphic VOAs and their irreducible modules. The simplest case is when the rational VOA has only one irreducible module, which is isomorphic to itself. Such a VOA is called holomorphic in the literature. In 1993, Scellenkens obtained a partial classification when the central charge  $c = 24$ . He determined the possible characters of such VOAs and the structures of their weight one subspaces, which are some Lie algebras. In his list, there are 71 possible theories but only 39 of them were constructed explicitly at that time.

In this talk, I will report the recent progress on the classification of holomorphic vertex operator algebras of central charge 24. Some basic ideas and methods will also be discussed.

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