

# Superconformal field theory, operator algebras and noncommutative geometry

YASUYUKI KAWAHIGASHI

University of Tokyo

This is a joint work with S. Carpi, R. Hillier and R. Longo.

We present recent progress on operator algebraic approach to (super)conformal field theory.

A chiral (super)conformal field theory is represented as a (super)local conformal net of factors on the 1-dimensional circle  $S^1$ , and we can formulate its representation theory in the style of the classical Doplicher-Haag-Roberts theory.

Then we have various classification results for small central charges based on  $A$ - $D$ - $E$  Dynkin diagrams. This includes a new construction of examples.

Then we discuss relations of our approach to another approach to (super)conformal field theory, that is, theory of (super)vertex operator algebras. We have various comparisons and translations between the two approaches and the construction of the Moonshine net is one of them.

The newest result here is a new connection to the noncommutative geometry. From a certain representation of the Ramond algebra, we construct a family of *noncommutative manifold of infinite dimension*.