Bes

Title:

Modular functions arising in physics

Abstract:

Research in conformal quantum field theory leads to the problem of classifying W-algebras (= special vertex operator algebras). The theory of W-algebras is still in the stage of collecting examples. Usually such examples are obtained by brute force computer search and in many cases they come without a rigorous proof of their actual existence. However, each (rational model of a) W-algebra predicts the existence of certain modular functions, the associated conformal characters. These seem to pocess in general very special properties which are completely independent of the physical background and are of purely mathematical interest.

In this talk I shall show how to construct explicitly in many cases of W-algebras whose existence is not yet rigourosly proved, the predicted conformal characters from a finite list of certain rational numbers (= the conformal dimensions) which is usually provided when the existence of a rational model is conjectured.

Secondly, I shall try to illustrate by some examples why conformal characters are very special modular functions and are of interest for number theorists and other pure mathematicians.

This talk is not intended as an introduction to W-algebras. However, no knowledge about these will be assumed.