

MATHEMATICS DEPARTMENT
North Carolina State University

ALGEBRA SEMINAR

Wednesday, February 2, 2005

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Vertex Algebras in Higher Dimensions and
Globally Conformal Invariant
Quantum Field Theory, I

ABSTRACT: The axiomatic approach to Quantum Field Theory (QFT) was proposed and accepted about fifty years ago as a mathematically rigorous framework for any QFT, but there are still no known nontrivial models in four or higher space-time dimensions. It was recently proven that the invariance of all correlation functions in a QFT under finite conformal transformations in a Minkowski space, i.e., the global conformal invariance, implies their rationality. This allows us to reformulate the theory in a suitable complex parameterization of the space-time and provides a higher-dimensional extension of the notion of a vertex algebra. A one to one correspondence between these vertex algebras and the axiomatic QFT with global conformal invariance is established. This gives a new insight into the problem of constructing nonfree QFT models in higher dimensions.

In this talk, I will give an introduction to the axiomatic QFT based on Wightman axioms, and will explain the concept of global conformal invariance and its implications.

Dr. Nikolov will give a second talk on February 9.

1:30 - 2:20 pm HA 370

Faculty and Students are invited to attend.