Colloquium of the SFB 647

TIME:
12 Jan 2010, 16:00 - 19:00

LOCATION:
Humboldt-Universität zu Berlin
Auditorium der Universitätsbibliothek
Jacob-und-Wilhelm-Grimm-Zentrum
Geschwister-Scholl-Straße 1/3
10117 Berlin

PROGRAM:

16:00 - 17:00 **Prof. Dr. Andreas Juhl**

The structure of conformally covariant powers of the Laplacian
The sum of the Laplace-Beltrami operator of a Riemannian manifold and a certain constant multiple of the scalar curvature is covariant under conformal changes of the metric. This operator is known as the Yamabe operator. It plays a central role in conformal geometric analysis. In 1983, Paneitz discovered that suitable modi□cations of the square of the Laplacian by lower order terms (involving the Ricci tensor and
the scalar curvature) yield a conformally covariant operator (of order four). In large parts of conformal geometric analysis, the Paneitz-operator now plays a role similar to that of the Yamabe operator. More generally, Graham, Jenne, Mason and Sparling (1992) constructed higher order conformally covariant powers of the Laplacian by using the Fe□erman-Graham ambient metric. In turn, these operators led to the notion of Branson's Q-curvature. In recent years, the advent of the AdS/CFT-
correspondence additionally stimulated the deeper study of these constructions. In particular, the systematic elaboration of the idea of bulk-boundary correspondences led to substantially new insights into the structure of these operators.
The lecture will give a moderate introduction into the web of ideas in

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this area, and will describe some very recent results concerning the intriguing recursive structure of conformally covariant powers of the Laplacian.

17:00 - 17:30 Coffee Break

17:30 - 18:30 **Dr. Lucy Gow**

Highest Weight Representations of Twisted q-Yangians

All finite-dimensional irreducible representations of finite-dimensional simple Lie algebras are of highest weight type, and the highest weight must be a dominant integral weight of the associated root system.
Similarly, all the finite-dimensional irreducible representations of the infinite-dimensional Hopf algebras called Yangians are of highest weight type, but the weights are ordered collections of formal power series satisfying certain conditions.
Twisted q-Yangians are coideal subalgebras of the quantum affine algebra associated with with defining relations analogous to those of twisted Yangians. In recent work with Alexander Molev we determined an appropriate definition of highest weight representation for twisted q-Yangians of type C and proved a highest weight theorem for these algebras. In this talk I will consider the key aspects of these algebras that are used to prove such highest weight theorems.

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