Inhaltsverzeichnis

1 [A6] Aspects of conformal geometry and the AdS/CFT correspondence 2005-2008

1.1 Summary

1.1.1 Conformally covariant differential operators, Q-curvature and holography

This project concerns the structure of geometric partial differential equations and related conformal invariants.

In the last decade the conjectural AdS/CFT-duality had fundamental influence on conformal geometry and related questions on geometric partial differential equations. The project deals with mathematical questions which are closely related to this development. A central link between mathematics and theoretical physics is provided by the Fefferman-Graham "ambient metric" and the equivalent Poincare-Einstein metric. A spectacular application of the ambient metric has been the construction of conformally covariant powers of the Laplacian. These operators are of independent interest. Their structure led to the notion of Branson's Q-curvature. In recent years the study of Q-curvature developed into an extensive research area on the cutting edge of various mathematical fields. The central problems of the project concern the structure of this higher order curvature notion and its generalizations and applications. Here we develop innovative techniques.

1.1.2 Holonomy problems for conformal structures