

Prof. Dr. Rod Gover (Auckland University) **A conformal approach to conformally compact manifolds**

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An almost Einstein manifold satisfies equations which are a slight weakening of the Einstein equations; Einstein metrics, Poincare-Einstein metrics, and compactifications of certain Ricci-flat asymptotically locally Euclidean structures are special cases. The governing equation is a conformally invariant overdetermined PDE on a function. Away from the zeros of this the almost Einstein structure is Einstein, while the zero set gives a scale singularity set which may be viewed as a conformal infinity of the Einstein metric. There is also a compatible generalization of the constant scalar curvature condition and this is linked to the so called asymptotically hyperbolic manifolds. We discuss the conformal tractor connection as a tool for studying these manifolds and the geometry of the singular set.

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