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Geometric discretisation of General Relativity.

Einstein's theory of gravity is a geometric theory. It describes a gravitating system as a ricci-flat Lorentzian manifold. As such it is invariant under diffeomorphisms which implies that individual points have no physical meaning. Only relations between several points are physically and geometrically meaningful. In this talk I present an approach to computational GR which is based on a discrete formulation of a geometry, i.e., on quantities defined on higher dimensional structures. It is shown that one can reproduce exact spherically symmetric solutions of Einstein's equations and plane waves. (Received September 24, 2006)