

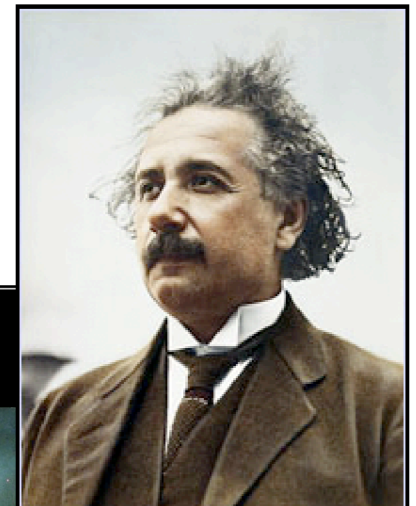
The Oliver Club

www.math.cornell.edu/~oliver/

Mu-Tao Wang, Columbia University

Isometric Embeddings of Surfaces and Quasilocal Gravitational Energy

In general relativity, gravitation is represented by the Lorentzian metric of spacetime. The Einstein field equation relates the gravitational and matter fields. The total energy contained in a bounded region in the universe has contributions from both sources. The matter fields have energy density and the energy can be evaluated as a flux integral over the boundary. However, the equivalence principle prevents the existence of energy density for gravitation. On a large scale, the gravitation dominates but the measurement of the gravitational energy is extremely subtle as it depends on the geometric configuration which is distorted by the underlying presumably nonflat Lorentz metric. In this talk, I shall explain a new way to measure the total energy contained in a bounded region using tools from differential geometry and PDEs, in particular the isometric embedding of the boundary surface. This is joint work with S. T. Yau at Harvard University.



Thursday, March 5, 2009
at 4:25 PM in 251 Malott Hall

Refreshments will be served at 3:55 PM in the Mathematics Department lounge (532 Malott Hall).