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Title: Extremal Kahler Metrics and Gravitational Instantons

Abstract: A Kähler metric is called extremal if its scalar curvature is a Killing potential, i.e. is the moment relative to the Kähler form of a Hamiltonian Killing vector field; it is called toric extremal if the latter belongs to a maximal, effective Hamiltonian toric action preserving the whole Kähler structure. The presence of such a Kähler structure in the conformal class of a class of four-dimensional gravitational instantons of ALF type, including the Euclidean version of well-known Lorentzian spaces, as well as the one-parameter family of instantons discovered in 2011 by Yu Chen and Edward Teo, plays a prominent rôle in its eventual complete classification, including a new definition of the Chen–Teo instanton, presented in joint paper with Olivier Biquard.