1003-53-947 **Xianzhe Dai**, **Xiaodong Wang** and **Guofang Wei*** (`wei@math.ucsb.edu`), Math Department, UC Santa Barbara, Santa Barbara, CA 93106. *The stability of compact Ricci flat manifolds.*

About thirty years ago, Kazdan-Warner asked if the Lichnerowicz Laplacian, which governs the second variation of the total scalar curvature functional, is positive semi-definite for compact Ricci flat manifolds. Using spin geometry we show that this is indeed the case for manifolds which admits a nonzero parallel spinor. This class of Ricci flat manifolds includes all manifolds with special holonomy such as Calabi-Yau and G2. The result can be used to derive info about positive scalar curvature metric and scalar flat metrics on such manifolds. For example one deduces that scalar flat deformation of Calabi-Yau metrics must still be Calabi-Yau. We will also explain its close relation with the positive mass theorems. This is a joint work with X. Dai and X. Wang. (Received October 01, 2004)