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Title: Slope conditions for some complex Hessian equations.

Abstract: It is well known that solvability of the complex Monge-Ampère equation on compact Kähler manifolds is related to the positivity of certain intersection numbers. In fact, this follows from combining Yau's celebrated resolution of the Calabi conjecture with Demailly and Paun's generalization of the classical Nakai-Mozhesoin criteria. This correspondence was recently extended to a broad class of complex non-linear PDEs including the J -equation and the deformed Hermitian-Yang-Mills equations by the work of Gao Chen and others. I will give a survey of these recent developments. If time permits, I will discuss some joint work with Ramesh Mete and Jian Song on solvability of such equations if positivity conditions fail.