RUTGERS
UNIVERSITY | NEWARK

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

Colloquium

MINIMAL SLOPES AND SINGULAR SOLUTIONS FOR SOME COMPLEX HESSIAN EQUATIONS

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ABSTRACT:

It is well known that solvability of the complex Monge-Ampère equation on compact Kaehler 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 (dHYM) equations by the work of Gao Chen and others (including some at IISc). A natural question to ask is whether solutions (necessarily singular) exist in any reasonable sense if the Nakai criteria fails. Results of this nature are ubiquitous in Kaehler geometry - existence of weak Kaehler-Einstein metrics on normal varieties and Hermitian-Einstein metrics on reflexive sheaves to name a couple. Much closer to the present theme, is the work of Boucksom-Eyssidieux-Guedj-Zeriahi on solving the complex Monge-Ampere equation in big classes. In the talk, I will first speak about some joint and ongoing work with Ramesh Mete and Jian Song, that offers a reasonably complete resolution in complex dimension two, at least for the J-equation and the dHYM equations. Next, I will discuss some conjectures on what one can expect in higher dimensions.

4 − 5pm
Wednesday, September 20, 2023
Room 204, Smith Hall