## A unified study of geometric and algebraic multigrid methods

JINCHAO XU

Department of Mathematics, Penn State University, University Park, PA 16802, USA xu@math.psu.edu

In this talk, I will report on a unified study of a number of multilevel methods including geometric and algebraic methods and upscaling methods. Emphasis will be on two classes of algebraic multigrid methods: one optimizing the coarsening with a fixed smoother, and the other optimizing the smoother with a fixed coarsening.