

**Title:** Variation bounds for spherical means and sparse domination

**Abstract:** The main focus in this talk will be on variation operators for the family of spherical means for which new results were obtained in joint work with David Beltran, Richard Oberlin, Luz Roncal and Betsy Stovall. These can be applied to a problem on sparse domination suggested by Lacey. In this context we discuss some general results on how sparse bounds for multi-scale operators relate to  $L^p$ -improving properties for local variants of such operators, including recent progress on endpoint sparse domination for classes of Fourier multipliers (joint work with David Beltran and Joris Roos).