Speaker: Xuan Duong, Macquarie University

Title: Weighted norm inequalities, Gaussian bounds and sharp spectral multipliers.

Abstract: Let L be a non-negative self adjoint operator on  $L^2(X)$  where X is a space of homogeneous type. Assume that L generates a holomorphic semigroup  $e^{-tL}$  whose kernels  $p_t(x, y)$  have Gaussian upper bounds but possess no regularity in variables x and y. In this talk, we study weighted  $L^p$ -norm inequalities for spectral multipliers of L. We show that sharp weighted Hörmander-type spectral multiplier theorems follow from Gaussian heat kernel bounds and appropriate  $L^2$  estimates of the kernels of the spectral multipliers. These results are applicable to spectral multipliers for large classes of operators including Laplace operators acting on Lie groups of polynomial growth or irregular non-doubling domains of Euclidean spaces, elliptic operators on compact manifolds and Schrödinger operators with non-negative potentials on complete Riemannian manifolds.

This is joint work with Adam Sikora and Lixin Yan.