Title: Lp theory for parabolic equations with local and non-local time derivatives.

Abstract: We discuss the unique solvability of parabolic equations in Sobolev spaces when the lower-order coefficients are in appropriate mixed $L_{p,q}$ spaces (not necessarily bounded). For this, we introduce refined Sobolev embeddings for solutions to parabolic equations in divergence form. The diffusion coefficients and the boundary of the domain can be very rough. We also discuss L_p-estimates and solvability results for time fractional parabolic equations with irregular coefficients. The time derivative is the Caputo fractional derivative of order $\alpha \in (0,1)$. We mainly focus on equations with measurable coefficients in the whole Euclidean space. As an application, we also solve equations on a half space and a partially bounded domain with Dirichlet and Neumann boundary conditions. This talk is based on joint papers with Hongjie Dong, Seungjin Ryu, and Kwan Woo.