

**CRUNCH Seminars at Brown, Division of Applied Mathematics**

**Friday – September 28, 2018**

**Spectral Fractional Diffusion: Well-posedness, Steady State, and Stochastic Solution Formulas**

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We introduce the spectral fractional Laplacian and discuss well-posedness, regularity, and convergence to a steady state for the parabolic problem. Then, we will study the connection with subordinate stopped Brownian motion and establish stochastic solution formulas (or Feynman-Kac formulas) for the parabolic problem. Combining this with the analytic results, we obtain stochastic solution formulas for the elliptic problem. Time permitting, we will discuss fast walk-on-spheres algorithms for parallel implementations of these formulas.