1044-60-58 **Erkan Nane*** (`nane@auburn.edu`), Department of Mathematics and Statistics, 221 parker Hall, Auburn University, Auburn, AL 36849. *FRACTIONAL CAUCHY PROBLEMS.*

Fractional Cauchy problems replace the usual first order time derivative by a fractional derivative. In this talk we give an overview of the solutions of fractional Cauchy problems in $\mathbb{R}^d$ and in bounded domains in $\mathbb{R}^d$. In particular, we derive classical solutions and stochastic analogues for fractional Cauchy problems in a bounded domain $D \subset \mathbb{R}^d$ with Dirichlet boundary conditions. Stochastic solutions are constructed via an inverse stable subordinator whose scaling index corresponds to the order of the fractional time derivative. Dirichlet problems corresponding to iterated Brownian motion in a bounded domain are then solved by establishing a correspondence with the case of a half-derivative in time.

Results in this talk are our joint work with Mark M. Meerschaert and P. Vellaisamy, which will appear in Annals of Probability.

(Received August 08, 2008)