**February 23, 2015**
**KAP 414**
**2:00 pm- 3:00**

# Prof. Tomoyuki Ichiba

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## "*Diffusions with rank-based characteristics and values in the nonnegative quadrant*"

Abstract: We construct diffusions with values in the nonnegative orthant, normal reflection along each of the axes, and two pairs of local drift/variance characteristics assigned according to rank; one of the variances is allowed to vanish, but not both. The construction involves solving a system of coupled Skorokohod reflection equations, then ``unfolding" the Skorokhod reflection of a suitable semimartingale in the manner of Prokaj (2009). Questions of pathwise uniqueness and strength are also addressed, for systems of stochastic differential equations with reflection that realize these diffusions. When the variance of the laggard is at least as large as that of the leader, it is true that the corner of the quadrant is never visited. We also discuss some other examples of unfolding one dimensional semimartingales and financial applications.