



# UNIVERSITY OF CALIFORNIA RIVERSIDE

## DEPARTMENT OF MATHEMATICS COLLOQUIUM

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UNIVERSITY OF MEMPHIS

### "THE PDES OF MATHEMATICAL FINANCE"

Exactly two linear (degenerate, parabolic, one space dimensional) PDEs play a prominent role in all graduate texts on Math Finance: The Nobel Prize winning Black-Merton-Scholes equation for stock options, and the Cox-ingersoll-Ross equations for bonds. We describe these and discuss our recent results on their deeper properties. The BMS equations is very closely related to the one dimensional heat equation, and we (Emamirad-Goldstein-Goldstein) prove it is chaotic. The CIR equation is governed by a strongly continuous semigroup; this new (2016) result of Goldstein-Goldstein-Mininni-Romanelli has been a conjecture since the appearance of the CIR paper twenty years ago. We also prove a new type of deterministic Feynman-Kac formula for the solution semigroup. The talk will be self-contained and accessible to graduate students.

WEDNESDAY, APRIL 27<sup>TH</sup>, 2016  
SURGE 284  
TEA TIME 3:40 P.M.  
TALK BEGINS 4:10 P.M.