1138-35-313 **Gisele Ruiz Goldstein*** (ggoldste@memphis.edu), Department of Mathematical Sciences, University of Memphis, Memphis, TN 38152, and **Jerome Arthur Goldstein** (jgoldste@memphis.edu), **Rosa Maria Minini** (rosamaria.minini@uniba.it) and **Silvia Romanelli** (silvia.romanelli@uniba.it). *The PDEs of Mathematical Finance.*

Of concern is the parabolic pde

$$\frac{\partial u}{\partial t} = \alpha x^k \frac{\partial^2 u}{\partial x^2} + (\beta + \gamma x) \frac{\partial u}{\partial x} + (\delta + \varepsilon x) u$$

for $t > 0$, $x \in J$. Here all constants are real and $\alpha > 0$. The generalized heat equation corresponds to $J = \mathbb{R}$, $k = 0$, $\gamma = \varepsilon = 0$; the generalized Black-Scholes equation corresponds to $J = (0, \infty)$, $k = 2$, $\beta = \varepsilon = 0$. The Cox-Ingersoll-Ross (CIR) equation corresponds to $J = (0, \infty)$, $k = 1$, $\delta = 0$, and β, γ both nonzero. These are deterministic equations with stochastic backgrounds in mathematical finance. The equations are studied on weighted sup norm spaces with various positive weights w,

$$Y_w = \{f \in C(J) : wf \in C_0(J)\}.$$

Results to be presented include semigroup generation for the Black-Scholes and CIR equations, chaos for the generalized heat and Black-Scholes equations, a new Feynman-Kac type formula for the CIR equation, and extensions of the CIR equation to more general potentials. This work is joint with J. A. Goldstein, R. Mininni, and S. Romanelli. (Received February 12, 2018)