

1163-60-1319

William A Massey* (wmassey@princeton.edu), ORFE Department, Sherrerd Hall, Princeton University, Princeton, NJ 08544. *Bessel Functions, Cauchy Problems, and Stochastic Processes.*

Many special functions and partial differential equations of mathematical physics can be reinterpreted using probability through the use of fundamental stochastic processes. As an example, we show that modified Bessel functions arise from the difference of two independent Poisson processes. Moreover, we can also solve the Cauchy problem for a parabolic heat equation the same way that we would solve the same for a hyperbolic reduced wave equation. We do this by averaging over the random “characteristic curves” of Brownian motion.

This talk is dedicated to the life and mathematics of Professor James Ashley Donaldson (1941-2019). He was Chair of the Mathematics Department at Howard University and later Dean of the College of Arts and Sciences. As chair, he oversaw the development of the first PhD degree program in mathematics at a historically Black college or university. He was also a founder of the National Association of Mathematicians and an inaugural speaker at the first Conference for African American Researchers in the Mathematical Sciences. (Received September 15, 2020)