Richard von Mises Lecture

15.30 **Louis H. Y. Chen, National University of Singapore**
From functional equations to probability approximations: The amazing Stein's Method

In his seminal 1972 paper published in the Sixth Berkeley Symposium, Charles Stein introduced a new method of normal approximation. The method did not involve Fourier analysis but hinged on the solution of a differential equation. Although the method was developed for normal approximation, Stein's ideas were very general and the method was modified by Chen (1975) for Poisson approximation. Since then the method has been constantly developed and applied to many approximations beyond normal and Poisson and in finite as well as infinite dimensional spaces. It has been applied in many areas including computational biology, computer science, combinatorial probability, random matrices, reliability and many more. The method, together with its applications, continues to grow and remains a very active research area. In this talk we will describe Stein's ideas, apply his method to a number of approximations, including normal, Poisson and exponential, and give a few applications.