TOPIC: Riemann Hypothesis and Mathematical Physics

SPEAKER: Charles Newman, NYU and NYU Shanghai

TIME: 2:00pm-3:00pm, Tuesday, November 14, 2017

VENUE: Room 264, Geography Building, Zhongbei Campus

ABSTRACT OF THE TALK

In both analytic number theory (the Riemann Hypothesis) and mathematical physics (Ising models and Euclidean field theories) the following complex analysis issue arises. For \( \rho \) a finite positive measure on the real line \( \mathbb{R} \), let \( H(z; \rho, \lambda) \) denote the Fourier transform of \( \exp\{\lambda u^2\} \, d\rho(u) \), i.e., the integral over \( \mathbb{R} \) of \( \exp\{izu + \lambda u^2\} \, d\rho(u) \) extended from real to complex \( z \), for those \( \lambda \) (including all \( \lambda < 0 \)) where this is possible. The issue is to determine for various \( \rho \)'s those \( \lambda \)'s for which all zeros of \( H \) in the complex plane are real. We will discuss some old and new theorems about this issue.

BIOGRAPHY

Charles Newman is a Silver Professor of Mathematics at the Courant Institute of Mathematical Sciences at New York University and an Affiliated Professor of Mathematics at NYU Shanghai. He holds an M.A. and a Ph.D. from Princeton University, and two B.S. degrees from MIT.

Professor Newman is a Fellow of the American Mathematical Society, a Fellow of the Institute of Mathematical Statistics, a member of the International Association of Mathematical Physicists, a member of the US National Academy of Sciences, a member of the American Academy of Arts and Sciences, and a member of the Brazilian Academy of Sciences.