Mathematics Department Colloquium

Organizer: Maciej Zworski

Thursdays, 4:10–5:00pm, 60 Evans

October 13 **Pierre van Moerbeke**, Université Catholique de Louvain and Miller Institute

From Random Matrices to Stochastic Processes, via Integrable Theory

In a celebrated paper, Dyson shows that the spectrum of a random Hermitian matrix, diffusing according to an Ornstein-Uhlenbeck process, evolves as non-colliding Brownian motions held together by a drift term. The universal edge, bulk and gap scalings for Hermitian random matrices, applied to the Dyson process, lead to novel stochastic processes, Markovian and non-Markovian; among them, the Airy, Sine and Pearcey processes. The integrable theory around the KdV and KP equations provides useful information on these new processes.