Alexander Moll
Northeastern University
U.S.A.

Soliton Quantization and Random Partitions

Abstract:

In this talk we present exact Bohr-Sommerfeld quantization conditions for the multi-phase and multi-soliton solutions of the classical Benjamin-Ono equation. As an application, we use the theory of coherent states to construct a distinguished regularization of the critical Benjamin-Ono Cauchy problem with random periodic initial data sampled from a log-correlated Gaussian field. We find that the conserved quantities of the random multi-phase solutions in our regularization define Jack measures on partitions, a special case of Borodin-Corwin's Macdonald measures. As a consequence, we realize old and new asymptotic results for random partitions as semi-classical and small dispersion asymptotics of our regularization. Our results suggest that random matrix universality captures quantum corrections to the well-known edge and bulk universality for classical dispersive shock waves.