



UC3M-ICMAT Seminar – 2014/2015

Applied Probability and Statistics

A field theory for the Wiener Sausage

Gunnar PRUESSNER
Imperial College London, UK

Thursday, February 26, 2015
11h30, ICMAT, *Aula Gris I*

The Wiener Sausage is a classic problem in probability theory that has been famously studied by Kolmogorov and Leontovich in 1933, as well as by a number of other very well known scientists, such as Spitzer, Kac and Luttinger, over the past one hundred years or so. The aim is to determine the moments of the volume traced out by a sphere attached to a Brownian particle. The Wiener Sausage can be re-formulated as a reaction diffusion process whose relevant observable follows the same limiting distributing as the original Wiener Sausage. That process allows a treatment using the Doi–Peliti formalism and renormalised field theory. This approach is appealingly elegant and flexible, allowing for boundary conditions and the properties of the underlying lattice to be changed very easily, as well as for very simple implementation of variations of the process, such as the introduction of branching. I will discuss a number of recent findings and extensions to characterise, for example, networks.

Instituto de Ciencias Matemáticas
Campus de Cantoblanco UAM
C/ Nicolás Cabrera 13-15
28049 Madrid, Spain
www.icmat.es