



ICQM Informal Seminar

Generalized Wigner Surmise in the Nanoworld and the Real World

Einstein (爱因斯坦)

Department of Physics, University of Maryland

Time: 10:30 am, Jun. 25, 2012 (Monday)

时间: 2012年6月25日 (周一) 上午10:30

Venue: Room 607, Conference Room A, Science Building 5

地点: 理科五号楼607会议室

Abstract

On misoriented ("vicinal") surface, the terrace-width (spacing between adjacent steps) distribution (TWD) can be related to the spacing distribution of repelling fermions in one dimension. The TWD can then be analyzed simply in terms of undergraduate quantum mechanics and with more sophistication in terms of general properties of equilibrium fluctuations, viz. generalizations of the Wigner distribution from random-matrix theory. This distribution has amazingly broadly applications, including spacings between parked cars and time between successive buses in Cuernavaca. It also emerges as the steady state solution of a Fokker-Planck description of step evolution. More recently we applied this approach to the proximity cells (capture zones) of islands and quantum dots on surfaces. However, one must go beyond our initial mean-field analysis. I discuss several experimental examples. We also consider the distribution of Metro stations in Paris, as well as the areal distribution of French districts, counties in eastern states, and other such secondary administrative units.

About the Speaker

Theodore L. Einstein got his bachelor's and master's degrees in 1969 at Harvard and his Ph.D. at Univ. of Pennsylvania in 1973, one of Nobel Laureate J. R. Schrieffer's 3 students in surface physics. In 1975, after a short postdoc at Penn, Ted joined the physics faculty at University of Maryland, College Park. His research focuses on statistical mechanics and electronic properties of surfaces and nanostructures thereon, often in close collaboration with experimentalists. He is a Fellow of APS (American Physical Society) and AVS (Surface Science), as well as a Humboldt Foundation Awardee (spent with H. Ibach in Juelich, Germany). He serves on the APS Council and has been Secretary/Treasurer of the APS Division of Materials Physics. Most of his papers can be downloaded from the publications page of his homepage at <http://www2.physics.umd.edu/~einstein>