Andrew Jordan

Title:
Supershifts, Superoscillations, and Superresolution

Abstract:

This talk of "supers" will discuss the application of different types of interference phenomena to sensing, metrology, and microscopy/telescopy. The interference phenomena are supershifts - the large shift of a pointer, conditioned on a postselection (a.k.a. weak value amplification), superoscillations - the oscillation of a band-limited function faster than the smallest Fourier frequency, and superresolution - the resolving of optical parameters beyond the diffraction limit. I will explore the relationships between these phenomena, discuss recent experiments, and give a unified treatment of these effects in terms of the available information, which is related to the sensitivity of the measured distribution to small changes in the parameter. How these effects respond in the presence of noisy environments will also be discussed.