



Πανεπιστήμιο
Κύπρου

The Department of Physics at the University of Cyprus
is organizing a seminar on

Tuesday, 6 of March 2018, time 5:00 p.m.

Room B228, Building 13, New Campus

Speaker:

Marco Califano

**Pollard Institute, School of Electronic and Electrical Engineering,
University of Leeds, Leeds LS2 9JT, United Kingdom.**

Email: m.califano@leeds.ac.uk

**“Trapping vs transport in colloidal quantum dot films:
two sides of the same coin”**

Semiconductor colloidal quantum dots (CQDs) are routinely exploited as building blocks for electronic, optoelectronic and photoelectrochemical devices, in a variety of different architectures, mostly based on ordered 2D or 3D arrays of these nanostructures. The presence of countless interfaces, with associated traps and potential steps, that the charge carriers need to cross in order to reach the electrodes where they can be collected, appears, however, a daunting obstacle to efficient transport in these devices.

This talk will first take a closer look at some of the most fearsome obstacles - the surface traps - in different materials and at the efficiency of the processes responsible for their population. We will then discuss whether bulk-like transport is possible in CQD films and which conditions are most favourable for achieving efficient miniband formation and large electron mobilities. The talk will conclude with a brief overview of the surprising optical properties of these systems.