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Novel silicon nano-objects

The discovery of the formation of (OD) silicon nano-dot and (1D) silicon nano-ribbons (SiNRs) on Ag(110) was first reported in 2005. Silicon nano-dot are the smallest form of silicon nano-structures that exploit properties of quantum dots to localize magnetic or electrical fields at very small scales and the nano-ribbons are unique form of silicon grown by direct synthesis (in our case are silicon's stripes grown along the substrate's surface Ag(110) with ultra-thin width (<50 nm) following the bottom-up approach that could be assembled into functional devices. The first step in this aproach is the synthesis and characterization of this form of nano-silicon and the study of their chemical, physical and structural properties. To explore the potential of one-dimensional (1D) silicon nanoribbons SiNRs, it is important to control and vary their structure in terms of length, orientation and diameter, that could modify their electronic properties. In this talk, we will first focus on the synthesis and structural characterization of the Si nano-dot and SiNRs, and then on their fundamental properties and also their functionalization and reactivity. Finally, we will describe possible applications of the SiNRs on nanoelectronic devices.

Biography

María E Dávila research focuses on "The synthesis and characterization of low-dimensional materials with special emphasis on semiconductors". Her interests include "Determining the structural and electronic structure of those materials". She has expertise in "The use of synchrotron radiation techniques to explore the physics and chemistry of low-dimensional materials". She completed her PhD in Condensed Matter Physics at University Auronoma of Madrid in 1996, followed by a Post-doctoral fellowship at University of Uppsala and KTH in Sweden.

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