ABSTRACT:

Novel Silicon Nanoforms

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In recent years, the scientific community has put a lot of efforts into trying to artificially grow new functional materials by reducing their dimensionality from 2D to 1D or even 0D. However, it is not a simple task, which includes synthetic methods that could go in both possible top-down or bottom-up approaches.

Our group, working on the bottom-up approach, has been able to grow unprecedented new 0D, 1D or 2D silicon nanoshapes[1,2]. In particular, we have unmasked the unique 1D pentagonal silicon structures, which had been elusive for over 10 years. Further, we will see how the different substrates greatly affects the growth of silicon and the new structures that can be formed on it[3].

Promising applications of new silicon nanoforms range from nanoelectronics to transistors or embedded sensors; however, one of the important challenges that we have to overcome is the isolation, through the separation of the substrates, of these interesting nanoforms.

Keywords: Silicon nanoribbons, 1D-Silicon.

Reference

1.   J. I. Cerdá, Jagoda Sławinska, G.Le Lay, A.C. Marele, J. M. Gómez-Rodríguez and M. E. Dávila. "Unveiling the pentagonal nature of perfectly aligned single-and double-strand Si nano-ribbons on Ag(110) ", *Nature Communications* , **2016**, 7:13076 | DOI: 10.1038/ncomms13076.
2.   M E Dávila, A Marele, P De Padova, I Montero, F Hennies, A Pietzsch, M N Shariati, J M Gómez-Rodríguez and G Le Lay "Comparative structural and electronic studies of hydrogen interaction with isolated versus ordered silicon nanoribbons grown on Ag(110)" *Nanotechnology* 2012-**23-**38 385703 **DOI** 10.1088/0957-4484/23/38/385703

3. M. E. Dávila G.Le Lay and J. I. Cerdá, "Reducing the dimensionality of novel materials: one-dimensional silicon nanoribbons" 2D Semiconductor Materials and Devices, Materials Today, 2020, Pages 221-249.