THE Alan G. MacDiarmid NanoTech Institute

PRESENTS

Elena del Corro
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Thursday, July 15th at 2 p.m.
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Elena is a fourth year Ph.D. student in chemistry at The University Complutense of Madrid. Her thesis focuses on the non-hydrostatic high pressure characterization of carbon materials like graphite and carbon nanotubes using Raman spectroscopy.

She belongs to the Spanish interdisciplinary network MALTA. The MALTA project consists of more than seventy scientists from twelve different research groups and is dedicated to the study of diverse high pressure phenomena from a variety of perspectives. One of the most fundamental goals of the project is to mimic processes and phenomena similar to those occurring in the interior of the Earth and other planetary objects and to understand their physical, chemical, geological, and biological foundations and implications.

In 2008 she spent four months at the Laboratoire de Physique de la Matiere Condensee et Nanostructures of Lyon (France) studying the behavior of monolayer graphene (prepared by mechanical exfoliation) under hydrostatic pressure.

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Resistance of Aligned Multi-Walled Carbon NanoTubes Under Pressure

Carbon nanotubes have become a research focus due to their exceptional mechanical and electronic properties. High pressure has been demonstrated to be an important probe into the electronic structure of carbon materials. In this work we study the change in resistance of a sheet of aligned multi-walled carbon nanotubes under non-hydrostatic pressure applied using a sapphire anvil cell. The sample at different pressures is characterized in-situ by Raman spectroscopy, one of the most widely used spectroscopic techniques used to examine carbon nanotubes due to the intense resonant Raman signal that results from the strong electron-phonon coupling in such monodimensional geometries. We performed several pressure cycles up to 5 GPa, and find that t high pressure values the resistance remains nearly constant, however in the low pressure regime we observe significant and partially irreversible changes. A correlation is made between the resistance and the intensity of the Raman feature associated to defects in carbon materials.