



ACCADEMIA NAZIONALE DEI LINCEI

FONDAZIONE «GUIDO DONEGANI»

INTERNATIONAL WORKSHOP

**LOW-DIMENSIONAL CARBON NANOSTRUCTURES:
GRAPHENE AND NANOTUBES**

18 MARCH 2013

ROMA

PALAZZO CORSINI - VIA DELLA LUNGARA, 10

PROGRAMME

ORGANIZERS: M. PRATO, A. SGAMELLOTTI, L. NICOLAIS

Monday, 18 march

- 9.00 Welcome addresses
- 9.30 G. SEIFERT (Technische Universität, Dresden), *Chirality and twist of carbon nanotubes*
- A. BIANCO (CNRS, Strasbourg), *Can we make carbon nanotubes biocompatible and biodegradable? Two paradigms for biomedical applications*
- D. BONIFAZI (University of Trieste - University of Namur), *Colouring the black: preparation and materials applications of luminescent carbon nanotubes*
- 11.00 Coffee break
- 11.30 M. BONCHIO (CNR-ITM, Padova), *Knitting the catalytic pattern of artificial photosynthesis by tailored carbon nanostructures*
- V. PALERMO (CNR-ISOF, Bologna), *Not a molecule, not a polymer, not a substrate... The many faces of graphene as a chemical platform*
- F. MERCURI (CNR-ISMN, Bologna), *Clar sext theory and low dimensional carbon nanostructures: electronic, chemical and transport properties*
- 14.30 K. MUELLEN (Max-Planck-Institute, Mainz), *Chemical synthesis and graphene research*
- N. MARZARI (École Polytechnique Fédérale, Lausanne), *Electrical and thermal transport in graphene: first principles benchmarks*
- A. FERRARI (University of Cambridge), *Illuminating graphene*
- G. CAROTENUTO (CNR-IMCB, Napoli), *A few layer graphene: preparation and chemical cross-linking by elemental sulphur*
- D. GULDI (University of Erlangen), *Low dimensional nanocarbon in solar energy conversion schemes*
- 17.00 Coffee break

PERSPECTIVES AND APPLICATIONS OF GRAPHENE

G. Seifert (Technische Universität, Dresden, Coordinator), R. Tomellini (European Commission), L. Ambrosio (CNR- DSCTM), E. Bichoutskaia (University of Nottingham), M. Inguscio (CNR - Accademia dei Lincei), V. Pellegrini (CNR - Scuola Normale di Pisa)

The Accademia Nazionale dei Lincei - Fondazione Guido Donegani and the Consiglio Nazionale delle Ricerche are organizing an international workshop on low-dimensional carbon nanostructures: graphene and nanotubes. Nanotechnology constitutes nowadays one of the most active fields of research, at the boundary between chemistry, physics and materials science. The peculiar interest in nanotechnology resides mostly on the emergence of novel phenomena when matter is confined to the nanometer scale, a domain size which is thus close to the typical size of atoms and molecules. Accordingly, research efforts are especially targeted to the development and characterization of novel nanostructured materials with tailored properties. In this context, recent years have witnessed a growing interest towards low-dimensional carbon nanostructures (LDCNs), such as carbon nanotubes (CNTs) and graphene, in view of their potential application in different fields of technology. Indeed, LDCNs exhibit a variety of novel and unusual structural, electronic, chemical and mechanical properties at the nanoscale and, consequently, have been spotted among the most appealing new materials for nanotechnology.

Recent work has especially been targeted to the development of experimental techniques for the controlled synthesis of LDCNs, which is nowadays considered a mandatory step in the development of technological devices. Particularly, bottom-up approaches, where complex carbon nanostructures are assembled starting from basic constituting units, represent appealing alternatives to traditional synthetic routes. A particularly attractive field of research is constituted by the study of functionalized LDCNs. Here, chemical manipulation and derivatization is exploited to realize novel hybrid nanostructured assemblies where the peculiar intrinsic properties of LDCNs are linked to those of other materials. Moreover, functionalization can also be used to develop novel hybrid devices or to achieve efficient integration with biological substrates.

Finally, basic research studies are expected to strongly contribute to envision a wide variety of applications of LDCNs. Beside the realization of devices for nanoelectronics, where the outstanding electron transport properties of LDCNs are exploited, recent research is focused on the study of novel materials with peculiar properties at the excited state, for example in the development of novel platforms for electroluminescence or solar energy harvesting.

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Fino alle ore 10 è possibile l'accesso anche da Lungotevere della Farnesina, 10