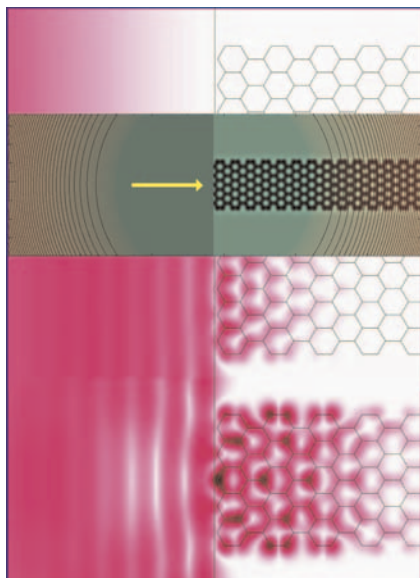


# Proceedings of the E-MRS 2007 Symposia L and M: Electron Transport in Low-Dimensional Carbon Structures and Science and Technology of Nanotubes and Nanowires

held in Strasbourg, France  
28 May–1 June 2007



Guest Editors:

**A.C. Ferrari**

*Engineering Department, University of Cambridge, Cambridge CB3 0FA, UK*

**V. Skákalová**

*Max Planck Institute for Solid State Research, D-70569 Stuttgart, Germany*

**P.-W. Chiu**

*National Tsing Hua University, Hsinchu 30013, Taiwan*

**A. Bachtold**

*Institute Catalan Nanotechnology and Centro Nacional Microelectrónica, E-08193 Bellaterra, Barcelona, Spain*

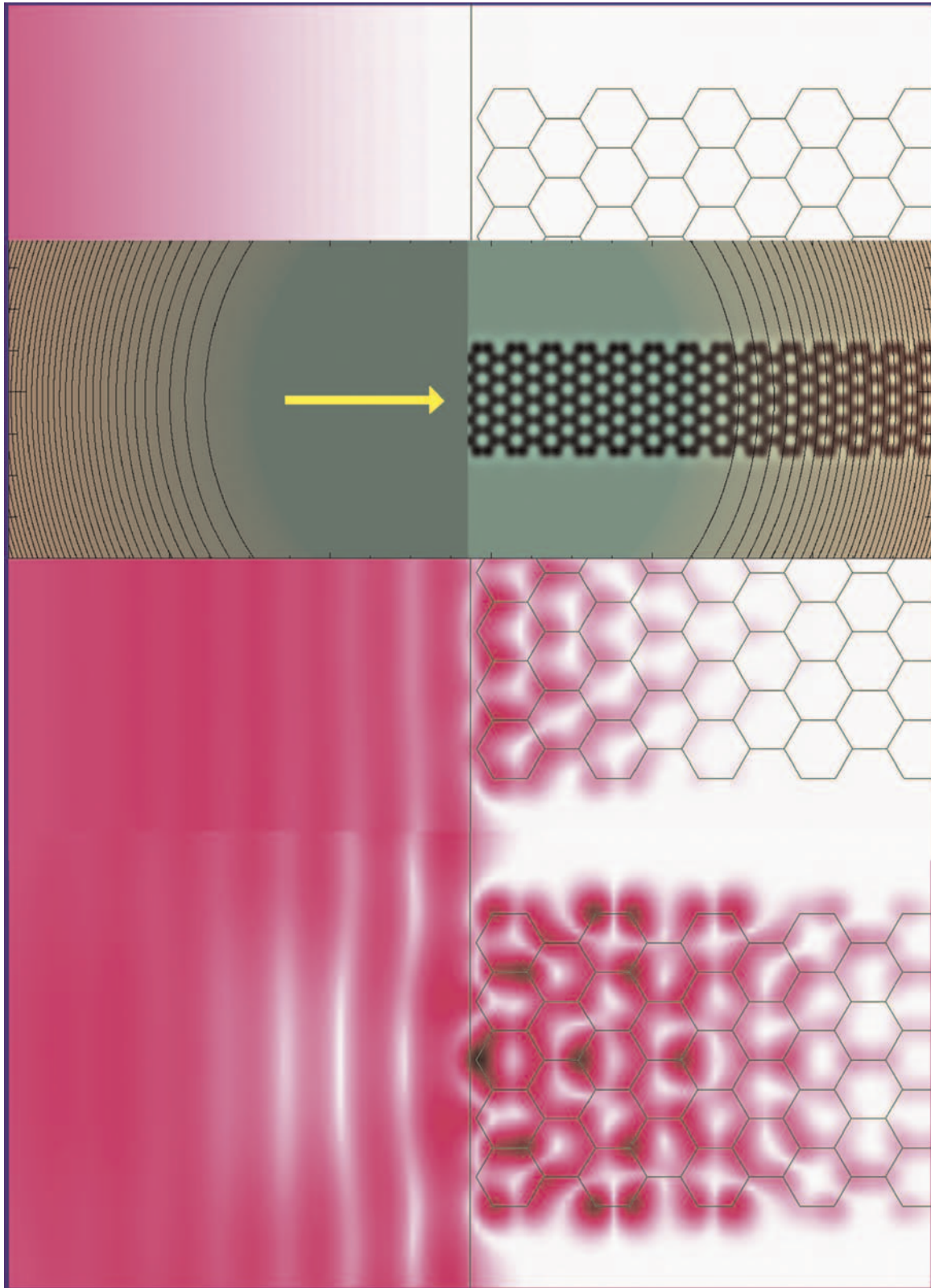
**D. Golberg**

*National Institute for Materials Science, Tsukuba, Japan*



ELSEVIER

Snapshots from the 3D Wave Packet Dynamical Simulation of  
Electron Transport through a Graphene Nanoribbon  
(Courtesy of Geza I. Mark.)



## Preface

# Science and technology of nanotubes, nanowires and graphene

The successful application of nanomaterials for nanotechnology faces four main challenges: materials preparation, characterization, device fabrication and integration. The physical properties of nanomaterials strongly depend on their atomic-scale structure, size and chemistry but also on their organization and aggregation. To fully exploit the technological advantages offered by these self-assembled molecular structures it is essential to acquire the ability to select, control and manipulate individual or aggregated nanomaterials. There has been much progress in the synthesis and characterization of nanostructures such as nanotubes, nanocrystals, atomic wires, organic and biological nanostructures, molecular junctions and graphene layers. However, immense challenges remain in understanding their properties and interactions with external probes to realize their tremendous potential for applications. Some of the frontiers in nanoscience include molecular electronics, nanoscale opto-electronic devices, nanomechanics, light harvesting and emitting nanostructures. Nanotubes, nanowires and graphene dominate the pursuit for materials for future nanotechnology applications.

Carbon nanotubes are a unique platform for many fundamental studies of quantum physics in low-dimensional systems, and several unexpected physical phenomena have been discovered. Recent breakthroughs in the high-yield, structure-selective manufacturing and techniques for separating metallic and semiconducting nanotubes promise to make commercial applications of this material real. Large efforts in the area of chemical modification and manipulation have allowed the design and fabrication of well-controlled architectures. Substantial progress has also been made in fabricating electronic devices, sensors, field-emission displays and nano-electro-mechanical systems using nanotubes and nanotube-based mesostructures.

One-dimensional nanowires are also receiving increasing attention because of their potential applications in electronics and photonics. Device performance typically depends on the material structure and crystallinity, but assembly is also a critical issue for applications. Fabrication of several types of one-dimensional nanostructures, such as nanowires, nanorods, nanosaws and nanoribbons, has been successfully demonstrated by several growth methods for elemental semiconductors, such as Si and Ge, as well as for

III–V and II–VI compounds. Nanotubes of various non-carbon materials have been found and characterized. Theoretical modelling of these structures continues to reveal fascinating attributes. The electronic functionality of these materials, based on the directional transport of charges or energy, makes them ideal building blocks for interconnecting individual quantum systems in supramolecular architectures, field effect transistors or photonic wires. The large surface to volume ratio results in a pronounced sensitivity to environmental conditions making them suitable as sensors in nanoscale devices.

Graphene is the latest carbon allotrope to be experimentally discovered, and it is now at the centre of a significant experimental and theoretical research effort. In particular, near-ballistic transport at room temperature and high carrier mobilities make it a potential material for nanoelectronics, especially for high-frequency applications. It is now possible to produce graphene samples with areas exceeding thousands of square microns by means of micro-mechanical cleavage of graphite, and much larger by “epitaxial” growth on SiC. An ongoing effort is being devoted to large-scale production and growth on different substrates of choice. Graphene nanoribbons are the counterpart of nanotubes in graphene nanoelectronics.

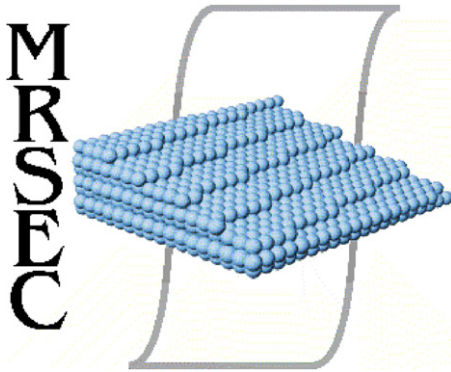
This volume contains the Proceedings of the European Materials Research Symposium L on “Electron Transport in Low-Dimensional Carbon Structures” and Symposium M on “Science and Technology of Nanotubes and Nanowires” held on May 28 to June 1, 2007—in Strasbourg, France. The symposia covered the progress in design, manufacturing and characterization of nanotubes, nanowires and graphene, and new developments leading to possible commercial applications of these materials. In particular several sessions focussed on:

- Progress in the synthesis of nanotubes/nanowires/graphene.
- Progress in the assembly of nanotubes/nanowires into well-controlled architectures.
- Electron and spin transport.
- Light absorption, emission and scattering.
- Carrier interactions, ultrafast dynamics of carriers, excitons, and phonons, band structure and optical spectra.

- Novel characterization techniques.
- Theoretical modelling of growth, electronic and optical properties.
- Fabrication and characterization of nanotube/nanowires/graphene devices, sensors, actuators.
- Nanocomposites.
- Applications and commercialization.
- Health/toxicity related issues.

We hope that these proceedings will provide the readers with a survey of most recent developments in these exciting fields of nanotechnology.

The symposia were sponsored by:



*Guest Editors*  
 Andrea C. Ferrari  
*Engineering Department, University of Cambridge,*  
*Cambridge CB3 0FA, UK*  
*E-mail address: acf26@hermes.cam.ac.uk*

Viera Skakalova  
*Max Planck Institute for Solid State Research,*  
*D-70569 Stuttgart, Germany*

Chiu Po-Wen  
*National Tsing Hua University,*  
*Hsinchu 30013, Taiwan*

Adrian Bachtold  
*Institute Catalan Nanotechnology and Centro Nacional*  
*Microelectrónica, E-08193 Bellaterra, Spain*

Dmitri Golberg  
*National Institute for Materials Science, Tsukuba, Japan*

# Contents

|  |      |
|--|------|
| Preface  | vii  |
| Contents   | ix   |
| List of Authors  | xv   |
| <b>Nanotubes: Growth</b>   |      |
| Local growth of aligned carbon nanotubes at surface sites irradiated by pulsed laser<br>K. Zimmer, R. Böhme and B. Rauschenbach  | 2223 |
| Modifying CVD synthesised carbon nanotubes via the carbon feed rate<br>E. Borowiak-Palen, A. Bachmatiuk, M.H. Rümmeli, T. Gemming, M. Kruszynska and R.J. Kalenczuk  | 2227 |
| Electrolytic synthesis of carbon nanotubes from carbon dioxide in molten salts and their characterization<br>I.A. Novoselova, N.F. Oliinyk, S.V. Volkov, A.A. Konchits, I.B. Yanchuk, V.S. Yefanov, S.P. Kolesnik and M.V. Karpets                                   | 2231 |
| Surface-bound chemical vapour deposition of carbon nanotubes: In situ study of catalyst activation<br>C. Mattevi, S. Hofmann, M. Cantoro, A.C. Ferrari, J. Robertson, C. Castellarin-Cudia, S. Dolafi, A. Goldoni and C. Cepek                                       | 2238 |
| Ex situ and in situ catalyst deposition for CNT synthesis by RF-magnetron sputtering<br>S. Scalese, V. Scuderi, F. Simone, A. Pennisi and V. Privitera   | 2243 |
| Investigation of conditions for preparation of oriented nanotubes at department of microelectronics in a modified plasma-enhanced hot filament chemical vapor deposition reactor<br>P. Vinduska, J. Janik and D. Buc   | 2247 |
| Catalyzed growth of oriented carbon nanotubes using Fe–organosilicon core–shell nanoparticles<br>C.T. Fleaca, I. Morjan, R. Alexandrescu, F. Dumitrache, I. Soare, L. Gavrila-Florescu, F. Le Normand and O. Ersen   | 2252 |
| Layer-by-layer deposition of ultra-thin films of carbon nanotubes<br>C. Bertoni, V. Skákalová and S. Roth  | 2257 |
| Complex superstructure patterns near defect sites of carbon nanotubes and graphite<br>L. Tapasztó, P. Nemes-Incze, Z. Osváth, M.C. Bein, Al. Darabont and L.P. Biró  | 2263 |
| On the low-temperature synthesis of SWCNTs by thermal CVD<br>X. Devaux and M. Vergnat  | 2268 |
| <b>Nanotubes: Electrical Transport</b>   |      |
| Development of carbon nanotube-based gas sensors for NO <sub>x</sub> gas detection working at low temperature<br>T. Ueda, M.M.H. Bhuiyan, H. Norimatsu, S. Katsuki, T. Ikegami and F. Mitsugi  | 2272 |
| Hysteresis suppression in self-assembled single-wall nanotube field effect transistors<br>P. Hu, C. Zhang, A. Fasoli, V. Scardaci, S. Pisana, T. Hasan, J. Robertson, W.I. Milne and A.C. Ferrari  | 2278 |
| The electronic properties of SWNTs intercalated by electron acceptors<br>M.V. Chernysheva, E.A. Kiseleva, N.I. Verbitskii, A.A. Eliseev, A.V. Lukashin, Yu.D. Tretyakov, S.V. Savilov, N.A. Kiselev, O.M. Zhigalina, A.S. Kumskov, A.V. Krestinin and J.L. Hutchison | 2283 |
| A polaron model of the electronic transport in a nanotube quantum dot<br>A. La Magna and I. Deretzis   | 2289 |

|   |      |
|---|------|
| Influence of capacitive effects on the dynamic of a CNTFET by Monte Carlo method<br>H. Cazin d'Honincthun, H.-N. Nguyen, S. Galdin-Retailleau, A. Bournel, P. Dollfus and J.P. Bourgoïn                                     | 2294 |
| Direct observation of transition from Tomonaga–Luttinger liquid states to superconductive phase in carbon nanotubes<br>M. Matsudaira, J. Haruyama, N. Murata, Y. Yagi, E. Einarsson, S. Maruyama, T. Sugai and H. Shinohara | 2299 |
| Semiclassical theory of decoherence in mesoscopic dissipative circuit<br>Y.-H. Ji and J.-q. Wang  | 2305 |
| Modelling conduction in carbon nanotube networks with different thickness, chemical treatment and irradiation<br>A.B. Kaiser, V. Skákalová and S. Roth  | 2311 |
| Decoherence resonances in carbon nanotubes<br>S. Krompiewski, V.K. Dugaev and J. Barnás   | 2319 |
| Multi-wall carbon nanotubes: Purification, morphology and field emission performance<br>S.-H. Su, W.-T. Chiang, C.-C. Lin and M. Yokoyama   | 2322 |
| Probing the electronic properties of single-walled carbon nanotubes with resonant and non-resonant microwave absorption<br>B. Corzilius, K.-P. Dinse and K. Hata  | 2327 |
| Electronic transport in carbon nanotube based nano-devices<br>I. Deretzi and A. La Magna  | 2333 |
| <b>Nanotubes: Structural and Optical Properties</b>   |      |
| Ab-initio calculation of Raman spectra of single-walled BN nanotubes<br>V. Pokropivny, S. Kovrygin, V. Gubanov, R. Lohmus, A. Lohmus and U. Vesí  | 2339 |
| Preferential functionalisation of carbon nanotubes probed by Raman spectroscopy<br>J. Liu, M. Dossot, D. Olevik, V. Mamane, B. Vigolo, D. Abrahamsson, H. Jonsson, Y. Fort, B. Humbert, A.V. Soldatov and E. McRae          | 2343 |
| Optical trapping of carbon nanotubes<br>O.M. Maragò, P.G. Gucciardi, F. Bonaccorso, G. Calogero, V. Scardaci, A.G. Rozhin, A.C. Ferrari, P.H. Jones, R. Saija, F. Borghese, P. Denti and M.A. Iati                          | 2347 |
| Optical properties of nanotube bundles by photoluminescence excitation and absorption spectroscopy<br>P.H. Tan, T. Hasan, F. Bonaccorso, V. Scardaci, A.G. Rozhin, W.I. Milne and A.C. Ferrari                              | 2352 |
| Carbon nanotube antenna: Far-field, near-field and thermal-noise properties<br>S.A. Maksimenko, G.Ya. Slepyan, A.M. Nemilentsau and M.V. Shuba  | 2360 |
| Exciton–photon correlations in carbon nanotubes<br>I.V. Bondarev and H. Qasmi   | 2365 |
| Stimulated emission of electron beam in nanotube bundles<br>K.G. Batrakov, P.P. Kuzhir and S.A. Maksimenko  | 2370 |
| Scaling of exciton binding energy with external dielectric function in carbon nanotubes<br>A.G. Walsh, A.N. Vamivakas, Y. Yin, S.B. Cronin, M.S. Ünlü, B.B. Goldberg and A.K. Swan  | 2375 |
| “Single-beam pumped” coherent anti-Stokes Raman scattering on carbon nanotubes thin films excited through surface plasmons<br>I. Baltog, M. Baibarac and S. Lefrant   | 2380 |
| Raman study on single-walled carbon nanotubes and multi-walled carbon nanotubes with different laser excitation energies<br>Y. Ouyang, L.M. Cong, L. Chen, Q.X. Liu and Y. Fang   | 2386 |
| Elastic buckling analysis of single-walled carbon nanotube under combined loading by using the ANSYS software<br>A.G. Arani, R. Rahmani and A. Arefmanesh   | 2390 |
| Theoretical study on non-covalent functionalization of armchair carbon nanotube by tetrathiafulvalene molecule<br>N. Sa, G. Wang, B. Yin and Y. Huang   | 2396 |
| Investigation of the microwave absorbing mechanisms of HiPco carbon nanotubes<br>P. Zhihua, P. Jingcui, P. Yanfeng, O. Yangyu and N. Yantao   | 2400 |

**Nanotubes: Polymer Composites**

- Formation of composite organic thin film transistors with nanotubes and nanowires  
G.W. Hsieh, P. Beecher, F.M. Li, P. Servati, A. Colli, A. Fasoli, D. Chu, A. Nathan, B. Ong, J. Robertson, A.C. Ferrari and W.I. Milne 2406
- Dispersibility and stability improvement of unfunctionalized nanotubes in amide solvents by polymer wrapping  
T. Hasan, V. Scardaci, P.H. Tan, A.G. Rozhin, W.I. Milne and A.C. Ferrari 2414
- Characterization of epoxy/single-walled carbon nanotubes composite samples via atomic force acoustic microscopy  
D. Passeri, M. Rossi, A. Alippi, A. Bettucci, M.L. Terranova, E. Tamburri and F. Toschi 2419
- Attenuation of electromagnetic waves by carbon nanotube composites  
B. Hornbostel, U. Leute, P. Pötschke, J. Kotz, D. Kornfeld, P.-W. Chiu and S. Roth 2425
- Direct transfer of CVD-grown transparent SWCNT networks from growth substrate to polymer  
A. Ansaldo, V. Skakalova, D. Ricci, E. Di Zitti and S. Roth 2430
- Mechanical properties of triple composites of polycarbonate, single-walled carbon nanotubes and carbon fibres  
B. Hornbostel, P. Pötschke, J. Kotz and S. Roth 2434
- Influence of the polymer structure and nanotube concentration on the conductivity and rheological properties of polyethylene/CNT composites  
O. Valentino, M. Sarno, N.G. Rainone, M.R. Nobile, P. Ciambelli, H.C. Neitzert and G.P. Simon 2440

**Nanowires: Growth and Structure**

- Multilevel modeling of the influence of surface transport peculiarities on growth, shaping, and doping of Si nanowires  
A. Efremov, A. Klimovskaya, I. Prokopenko, Yu. Moklyak and D. Hourlier 2446
- Water-repellent ZnO nanowires films obtained by octadecylsilane self-assembled monolayers  
C. Badre, T. Pauporté, M. Turmine, P. Dubot and D. Lincot 2454
- Nanoscale compositional analysis of Ni-based seed crystallites associated with GaN nanowire growth  
L. Lari, R.T. Murray, T.J. Bullough, P.R. Chalker, M. Gass, C. Chèze, L. Geelhaar and H. Riechert 2457
- Investigation of Au and In as solvents for the growth of silicon nanowires on Si(111)  
A. Kramer, T. Boeck, P. Schramm and R. Fornari 2462

**Nanowires: Optical and Electrical Properties**

- Polyfluorene nanowire active waveguides as sub-wavelength polarized light sources  
D. O'Carroll and G. Redmond 2468
- Comparative study of memory-switching phenomena in phase change GeTe and Ge<sub>2</sub>Sb<sub>2</sub>Te<sub>5</sub> nanowire devices  
S.-H. Lee, Y. Jung, H.-S. Chung, A.T. Jennings and R. Agarwal 2474
- Unipolar rectifying silicon nanowires—TCAD study  
K. Fobelets and J.E. Velazquez-Perez 2481
- Electrical properties of electrodeposited CdS nanowires  
M. Ghenescu, L. Ion, I. Enculescu, C. Tazlaoanu, V.A. Antohe, M. Sima, M. Enculescu, E. Matei, R. Neumann, O. Ghenescu, V. Covlea and S. Antohe 2485
- Optical properties of nanostructured ZnO crystal synthesized by pulsed-laser ablation  
K. Sakai, S. Oyama, K. Noguchi, A. Fukuyama, T. Ikari and T. Okada 2489
- Luminescence and EPR study of ZnO:Mn:Cu nanowire array  
M. Sima, I. Enculescu, M.N. Grecu, M. Secu, M. Sima, E. Matei and V. Vasile 2494
- GeO<sub>2</sub> nanostructures fabricated by heating of Ge powders: Pt-catalyzed growth, structure, and photoluminescence  
H.W. Kim and J.W. Lee 2499
- Transport properties of electrodeposited ZnO nanowires  
C. Tazlaoanu, L. Ion, I. Enculescu, M. Sima, M. Enculescu, E. Matei, R. Neumann, R. Bazavan, D. Bazavan and S. Antohe 2504
- A new mechanism for modulation of Schottky barrier heights on silicon nanowires  
J. Piscator and O. Engström 2508

**Organic and Inorganic Nanostructures**

|   |      |
|---|------|
| Synthesis of boron nitride nanotubes, bamboos and nanowires<br>L. Li, C.P. Li and Y. Chen   | 2513 |
| A ferromagnetic (porous silicon/metal)-nanocomposite with an additional paramagnetic behavior<br>K. Rumpf, P. Granitzer, P. Pölt, S. Šimić, M. Hofmayer and H. Krenn  | 2517 |
| New dimensionality classifications of nanostructures<br>V.V. Pokropivny and V.V. Skorokhod  | 2521 |
| Low-temperature synthesis of one-dimensional ZnO nanostructures on screen-printed carbon nanotube films<br>S.-S. Park, J.-M. Lee, S.-I. Yoon, D.-G. Lee, S.-J. Kim, S.-H. Kim, S. Maeng and S.-W. Kim                               | 2526 |
| Preparation and magnetic properties of ordered iron nanowires in mesoporous silica matrix<br>A.A. Eliseev, I.V. Kolesnik, A.V. Lukashin, Yu.D. Tretyakov and P. Görnert   | 2531 |
| Comparative optical and structural studies of CdSe films grown by chemical bath deposition and pulsed laser deposition<br>M.A. Hernandez-Perez, J. Aguilar-Hernandez, G. Contreras-Puente, J.R. Vargas-García and E. Rangel-Salinas | 2535 |
| High specific surface area porous SiC ceramics coated with reticulated amorphous SiC nanowires<br>L. Shi, H. Zhao, Y. Yan, Z. Li and C. Tang  | 2540 |
| Characteristics of gold nanowires and UV spectral changes by interaction between gold nanoparticles and DNA<br>S. Cha, H.J. Kim, N.-H. Kim and Y. Roh   | 2545 |
| Effective synthesis of surface-modified boron nitride nanotubes and related nanostructures and their hydrogen uptake<br>T. Terao, Y. Bando, M. Mitome, K. Kurashima, C.Y. Zhi, C.C. Tang and D. Golberg                             | 2551 |
| Vibrational and photoluminescence properties of composites based on zinc oxide and single-walled carbon nanotubes<br>M. Baibarac, I. Baltog, S. Lefrant, J.Y. Mevellec and M. Husanu  | 2556 |
| Estimation of multi-walled carbon nanotubes toxicity <i>in vitro</i><br>S.V. Prylutska, I.I. Grynyuk, O.P. Matyshevska, V.M. Yashchuk, Yu.I. Prylutsky, U. Ritter and P. Scharff  | 2565 |
| Modeling phonons of carbon nanowires<br>M. Tommasini, A. Milani, D. Fazzi, M. Del Zoppo, C. Castiglioni and G. Zerbi  | 2570 |
| Nanocolumnar CuInS <sub>2</sub> thin films by glancing angle deposition<br>F.C. Akkari, M. Kanzari and B. Rezig   | 2577 |
| Nitrogen-doped ultrananocrystalline carbon: Response to small amplitude AC signals<br>M.C. Feliciangeli, M.C. Rossi, G. Conte and V. Ralchenko  | 2583 |
| Kinetics of 2D–3D transformations of carbon nanostructures<br>I.V. Lebedeva, A.A. Knizhnik, A.A. Bagatur'yants and B.V. Potapkin  | 2589 |
| On the performance of supercapacitors with electrodes based on carbon nanotubes and carbon activated material—A review<br>V.V.N. Obreja   | 2596 |
| Density functional non-equilibrium Green's function (DFT-NEGF) study of the smallest nano-molecular switch<br>M.D. Ganji and F. Nourozi   | 2606 |
| Charge fluctuations in quantum point contact<br>B.R. Buřka, I.V. Dinu and M. Ţolea  | 2614 |
| Ion irradiation of carbon nanotubes encapsulating cobalt crystals<br>O. Lehtinen, L. Sun, T. Nikitin, A.V. Krashennnikov, L. Khriachtchev, J.A. Rodríguez-Manzo, M. Terrones, F. Banhart and J. Keinonen                            | 2618 |
| <b>Graphene</b>   |      |
| Diffusive transport in graphene<br>K. Ziegler   | 2622 |
| Electromagnetic response of electrons in graphene: Non-linear effects<br>S.A. Mikhailov   | 2626 |



|   |      |
|---|------|
| Transverse and longitudinal magnetoresistance in graphite intercalated by Co<br>D.V. Matsui, Yu.I. Prylutsky, L.Yu. Matzuy, F. Le Normand, U. Ritter and P. Scharff | 2630 |
| Wave packet dynamical simulation of electron transport through a line defect on the graphene surface<br>G.I. Márk, L.P. Biró, Ph. Lambin and L.A. Chernozatonskii   | 2635 |
| Magnetic translation group for graphene<br>A. Wal   | 2639 |
| Departure from the conical dispersion in epitaxial graphene<br>S.Y. Zhou, D.A. Siegel, A.V. Fedorov and A. Lanzara  | 2642 |

# List of Authors

- A
- Abrahamsson, D. 2343  
 Agarwal, R. 2474  
 Aguilar-Hernandez, J. 2535  
 Akkari, F.C. 2577  
 Alexandrescu, R. 2252  
 Alippi, A. 2419  
 Ansaldo, A. 2430  
 Antohe, S. 2485, 2504  
 Antohe, V.A. 2485  
 Arani, A.G. 2390  
 Arefmanesh, A. 2390
- B
- Bachmatiuk, A. 2227  
 Badre, C. 2454  
 Bagatur'yants, A.A. 2589  
 Baibarac, M. 2380, 2556  
 Baltog, I. 2380, 2556  
 Bando, Y. 2551  
 Banhart, F. 2618  
 Barnaś, J. 2319  
 Batrakov, K.G. 2370  
 Bazavan, D. 2504  
 Bazavan, R. 2504  
 Beecher, P. 2406  
 Bein, M.C. 2263  
 Bertoni, C. 2257  
 Bettucci, A. 2419  
 Bhuiyan, M.M.H. 2272  
 Biró, L.P. 2263, 2635  
 Boeck, T. 2462  
 Böhme, R. 2223  
 Bonaccorso, F. 2347, 2352  
 Bondarev, I.V. 2365  
 Borghese, F. 2347  
 Borowiak-Palen, E. 2227  
 Bourgoin, J.P. 2294  
 Bournel, A. 2294  
 Buc, D. 2247  
 Bułka, B.R. 2614  
 Bullough, T.J. 2457
- C
- Calogero, G. 2347  
 Cantoro, M. 2238  
 Castellarin-Cudia, C. 2238
- Castiglioni, C. 2570  
 Cazin d'Honincthun, H. 2294  
 Cepek, C. 2238  
 Cha, S. 2545  
 Chalker, P.R. 2457  
 Chen, L. 2386  
 Chen, Y. 2513  
 Chernozatonskii, L.A. 2635  
 Chernysheva, M.V. 2283  
 Chèze, C. 2457  
 Chiang, W.-T. 2322  
 Chiu, P.-W. 2425  
 Chu, D. 2406  
 Chung, H.-S. 2474  
 Ciambelli, P. 2440  
 Colli, A. 2406  
 Cong, L.M. 2386  
 Conte, G. 2583  
 Contreras-Puente, G. 2535  
 Corzilius, B. 2327  
 Covlea, V. 2485  
 Cronin, S.B. 2375
- D
- Darabont, Al. 2263  
 Del Zoppo, M. 2570  
 Denti, P. 2347  
 Deretzis, I. 2289, 2333  
 Devaux, X. 2268  
 Di Zitti, E. 2430  
 Dinse, K.-P. 2327  
 Dinu, I.V. 2614  
 Dolafi, S. 2238  
 Dollfus, P. 2294  
 Dossot, M. 2343  
 Dubot, P. 2454  
 Dugaev, V.K. 2319  
 Dumitrache, F. 2252
- E
- Efremov, A. 2446  
 Einarsson, E. 2299  
 Eliseev, A.A. 2283, 2531  
 Enculescu, I. 2485, 2494, 2504  
 Enculescu, M. 2485, 2504  
 Engström, O. 2508  
 Ersen, O. 2252
- F
- Fang, Y. 2386  
 Fasoli, A. 2278, 2406  
 Fazzi, D. 2570  
 Fedorov, A.V. 2642  
 Feliciangeli, M.C. 2583  
 Ferrari, A.C. 2238, 2278, 2347, 2352, 2406, 2414  
 Fleaca, C.T. 2252  
 Fobelets, K. 2481  
 Fornari, R. 2462  
 Fort, Y. 2343  
 Fukuyama, A. 2489
- G
- Galdin-Retailleau, S. 2294  
 Ganji, M.D. 2606  
 Gass, M. 2457  
 Gavrilă-Florescu, L. 2252  
 Geelhaar, L. 2457  
 Gemming, T. 2227  
 Ghenescu, M. 2485  
 Ghenescu, O. 2485  
 Golberg, D. 2551  
 Goldberg, B.B. 2375  
 Goldoni, A. 2238  
 Görnert, P. 2531  
 Granitzer, P. 2517  
 Grecu, M.N. 2494  
 Grynyuk, I.I. 2565  
 Gubanov, V. 2339  
 Gucciardi, P.G. 2347
- H
- Haruyama, J. 2299  
 Hasan, T. 2278, 2352, 2414  
 Hata, K. 2327  
 Hernandez-Perez, M.A. 2535  
 Hofmann, S. 2238  
 Hofmayer, M. 2517  
 Hornbostel, B. 2425, 2434  
 Hourlier, D. 2446  
 Hsieh, G.W. 2406  
 Hu, P. 2278  
 Huang, Y. 2396  
 Humbert, B. 2343
- Husanu, M. 2556  
 Hutchison, J.L. 2283
- I
- Iati, M.A. 2347  
 Ikari, T. 2489  
 Ikegami, T. 2272  
 Ion, L. 2485, 2504
- J
- Janik, J. 2247  
 Jennings, A.T. 2474  
 Ji, Y.-H. 2305  
 Jingcui, P. 2400  
 Jones, P.H. 2347  
 Jonsson, H. 2343  
 Jung, Y. 2474
- K
- Kaiser, A.B. 2311  
 Kalenczuk, R.J. 2227  
 Kanzari, M. 2577  
 Karpets, M.V. 2231  
 Katsuki, S. 2272  
 Keinonen, J. 2618  
 Khriachtchev, L. 2618  
 Kim, H.W. 2499  
 Kim, H.J. 2545  
 Kim, N.-H. 2545  
 Kim, S.-H. 2526  
 Kim, S.-J. 2526  
 Kim, S.-W. 2526  
 Kiselev, N.A. 2283  
 Kiseleva, E.A. 2283  
 Klimovskaya, A. 2446  
 Knizhnik, A.A. 2589  
 Kolesnik, I.V. 2531  
 Kolesnik, S.P. 2231  
 Konchits, A.A. 2231  
 Kornfeld, D. 2425  
 Kotz, J. 2425, 2434  
 Kovrygin, S. 2339  
 Kramer, A. 2462  
 Krashennnikov, A.V. 2618  
 Krenn, H. 2517  
 Krestinin, A.V. 2283  
 Krompiewski, S. 2319  
 Kruszynska, M. 2227

- Kumskov, A.S. 2283  
 Kurashima, K. 2551  
 Kuzhir, P.P. 2370
- L
- La Magna, A. 2289, 2333  
 Lambin, Ph. 2635  
 Lanzara, A. 2642  
 Lari, L. 2457  
 Le Normand, F. 2252, 2630  
 Lebedeva, I.V. 2589  
 Lee, D.-G. 2526  
 Lee, J.-M. 2526  
 Lee, J.W. 2499  
 Lee, S.-H. 2474  
 Lefrant, S. 2380, 2556  
 Lehtinen, O. 2618  
 Leute, U. 2425  
 Li, C.P. 2513  
 Li, F.M. 2406  
 Li, L. 2513  
 Li, Z. 2540  
 Lin, C.-C. 2322  
 Lincot, D. 2454  
 Liu, J. 2343  
 Liu, Q.X. 2386  
 Lohmus, A. 2339  
 Lohmus, R. 2339  
 Lukashin, A.V. 2283, 2531
- M
- Maeng, S. 2526  
 Maksimenko, S.A. 2360, 2370  
 Mamane, V. 2343  
 Maragò, O.M. 2347  
 Márk, G.I. 2635  
 Maruyama, S. 2299  
 Matei, E. 2485, 2494, 2504  
 Matsudaira, M. 2299  
 Matsui, D.V. 2630  
 Mattevi, C. 2238  
 Matyshevskaya, O.P. 2565  
 Matzuy, L.Yu. 2630  
 McRae, E. 2343  
 Mevellec, J.Y. 2556  
 Mikhailov, S.A. 2626  
 Milani, A. 2570  
 Milne, W.I. 2278, 2352, 2406, 2414  
 Mitome, M. 2551  
 Mitsugi, F. 2272
- Moklyak, Yu. 2446  
 Morjan, I. 2252  
 Murata, N. 2299  
 Murray, R.T. 2457
- N
- Nathan, A. 2406  
 Neitzert, H.C. 2440  
 Nemes-Incze, P. 2263  
 Nemilentsau, A.M. 2360  
 Neumann, R. 2485, 2504  
 Nguyen, H.-N. 2294  
 Nikitin, T. 2618  
 Nobile, M.R. 2440  
 Noguchi, K. 2489  
 Norimatsu, H. 2272  
 Nourozi, F. 2606  
 Novoselova, I.A. 2231
- O
- Obreja, V.V.N. 2596  
 O'Carroll, D. 2468  
 Okada, T. 2489  
 Olevik, D. 2343  
 Oliinyk, N.F. 2231  
 Ong, B. 2406  
 Osváth, Z. 2263  
 Ouyang, Y. 2386  
 Oyama, S. 2489
- P
- Park, S.-S. 2526  
 Passeri, D. 2419  
 Pauporté, T. 2454  
 Pennisi, A. 2243  
 Pisana, S. 2278  
 Piscator, J. 2508  
 Pokropivny, V. 2339  
 Pokropivny, V.V. 2521  
 Pölt, P. 2517  
 Potapkin, B.V. 2589  
 Pötschke, P. 2425, 2434  
 Privitera, V. 2243  
 Prokopenko, I. 2446  
 Prylutska, S.V. 2565  
 Prylutsky, Yu.I. 2565, 2630
- Q
- Qasmi, H. 2365
- R
- Rahmani, R. 2390  
 Rainone, N.G. 2440  
 Ralchenko, V. 2583  
 Rangel-Salinas, E. 2535  
 Rauschenbach, B. 2223  
 Redmond, G. 2468  
 Rezig, B. 2577  
 Ricci, D. 2430  
 Riechert, H. 2457  
 Ritter, U. 2565, 2630  
 Robertson, J. 2238, 2278, 2406  
 Rodríguez-Manzo, J.A. 2618  
 Roh, Y. 2545  
 Rossi, M. 2419  
 Rossi, M.C. 2583  
 Roth, S. 2257, 2311, 2425, 2430, 2434  
 Rozhin, A.G. 2347, 2352, 2414  
 Rümmeli, M.H. 2227  
 Rumpf, K. 2517
- S
- Sa, N. 2396  
 Saija, R. 2347  
 Sakai, K. 2489  
 Sarno, M. 2440  
 Saviolov, S.V. 2283  
 Scalese, S. 2243  
 Scardaci, V. 2278, 2347, 2352, 2414  
 Scharff, P. 2565, 2630  
 Schramm, P. 2462  
 Scuderi, V. 2243  
 Secu, M. 2494  
 Servati, P. 2406  
 Shi, L. 2540  
 Shinohara, H. 2299  
 Shuba, M.V. 2360  
 Siegel, D.A. 2642  
 Sima, M. 2485, 2494, 2504  
 Šimić, S. 2517  
 Simon, G.P. 2440  
 Simone, F. 2243  
 Skákalová, V. 2257, 2311, 2430  
 Skorokhod, V.V. 2521  
 Slepyan, G.Ya. 2360
- Soare, I. 2252  
 Soldatov, A.V. 2343  
 Su, S.-H. 2322  
 Sugai, T. 2299  
 Sun, L. 2618  
 Swan, A.K. 2375
- T
- Tamburri, E. 2419  
 Tan, P.H. 2352, 2414  
 Tang, C. 2540  
 Tang, C.C. 2551  
 Tapasztó, L. 2263  
 Tazlaoanu, C. 2485, 2504  
 Terao, T. 2551  
 Terranova, M.L. 2419  
 Terrones, M. 2618  
 Ţolea, M. 2614  
 Tommasini, M. 2570  
 Toschi, F. 2419  
 Tretyakov, Yu.D. 2283, 2531  
 Turmine, M. 2454
- U
- Ueda, T. 2272  
 Ünlü, M.S. 2375
- V
- Valentino, O. 2440  
 Vamivakas, A.N. 2375  
 Vargas-García, J.R. 2535  
 Vasile, V. 2494  
 Velazquez-Perez, J.E. 2481  
 Verbitskii, N.I. 2283  
 Vergnat, M. 2268  
 Vesi, U. 2339  
 Vigolo, B. 2343  
 Vinduska, P. 2247  
 Volkov, S.V. 2231
- W
- Wal, A. 2639  
 Walsh, A.G. 2375  
 Wang, G. 2396  
 Wang, J.-q. 2305

- Y
- Yagi, Y. 2299  
Yan, Y. 2540  
Yanchuk, I.B. 2231  
Yanfeng, P. 2400  
Yangyu, O. 2400
- Yantao, N. 2400  
Yashchuk, V.M. 2565  
Yefanov, V.S. 2231  
Yin, B. 2396  
Yin, Y. 2375  
Yokoyama, M. 2322  
Yoon, S.-I. 2526
- Z
- Zerbi, G. 2570  
Zhang, C. 2278  
Zhao, H. 2540  
Zhi, C.Y. 2551  
Zhigalina, O.M. 2283
- Zhihua, P. 2400  
Zhou, S.Y. 2642  
Ziegler, K. 2622  
Zimmer, K. 2223