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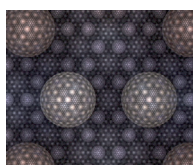
institute

Scientific Report Memoria Científica

2007-2008

for

the



imdea
nanociencia



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summary

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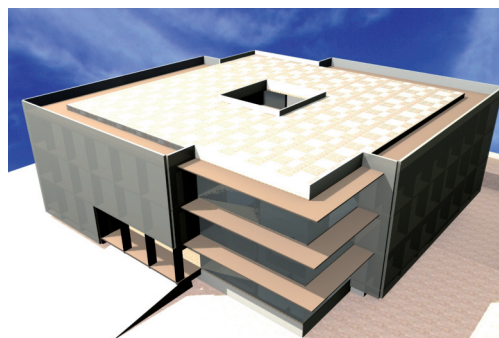
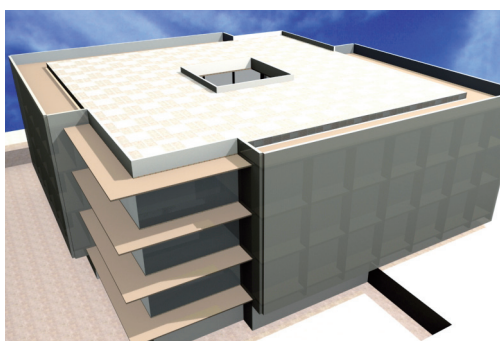
1. INTRODUCTION

Since the meeting of the Board of Trustees of the IMDEA-Nanociencia Foundation last December, our Institute has started a wide variety of activities ranging from complementing our administrative staff to recruiting scientific personnel, designing the building and establishing agreements with different institutions, activities all of them directed to place our Institute in the future map of leading centres on Nanociencia at an international level.

Thus, the staff of the Institute has been working on establishing different institutional agreements, on the various aspects needed for the construction of the new building at the UAM campus, on selecting and hiring a number of scientists to be engaged with IMDEA-Nanociencia, a number that has been growing up moderately and, in any case, according to the current possibilities of available laboratories. In this regard, six scientists have been incorporated to the Institute as well as another five associate scientists (see report below).

In this period of time, the scientific productivity of our Institute has been quite satisfactory, with 4 papers published in 2007 and 31 papers came out along the present year, all of them in highly demanding impact factor journals. Furthermore, the scientific activity has also been spreaded to invited conferences, seminars and lectures given along the last year by scientists engaged to IMDEA-Nanociencia.

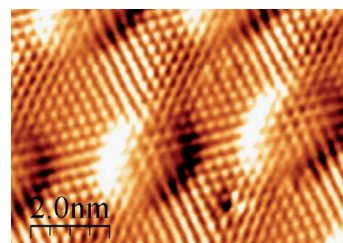
Other important aspect to be noted is the number of seminars at IMDEA-Nanociencia presented by highly recognised scientists coming from all over the world. These scientific activities, as well as the many events, workshops, courses, exhibitions, etc carried out, have resulted in a very intensive scientific activity within the framework of IMDEA-Nanociencia, as described in this report.



2. STAFF

EXECUTIVES

- **General Director.** Prof. Rodolfo Miranda Soriano. Full Prof. in Condensed Matter Physics. UAM.
- **Vice-Director.** Prof. Nazario Martín León. Full Prof. in Organic Chemistry. UCM.
- **Manager.** Dr. Jose Luis Casillas Sánchez.
- **Administration and Finance Manager.** Sra. D^a Isabel Rodríguez Cabezas.
- **Projects, Institutional Relations and HR Manager.** Dra. María Jesús Villa Hormaeche.



SCIENTISTS

IMDEA Nanociencia Scientists

- Dr. Johannes Gierschner. Senior Researcher (Ramón y Cajal Program 2007). **Molecular Nanoscience: Optical Spectroscopy on Molecular Systems.**
- Dr. Ricardo Arias González de la Aleja. Research Fellow. (Ramón y Cajal Program 2007). **Biomachines and Manipulation of Macromolecules: Biomechanic of Proteins.**
- Dr. Beatriz Hernández Juárez. Research Fellow. (Ramón y Cajal Program 2007). **Molecular Nanoscience: nanotubes and quantum dots.**
- Dr. Teresa González Pérez. Research Fellow. (Ramón y Cajal Program 2008) **Nanoelectronics and Superconductivity at the Nanoscale: Electric Conductivity of Single Molecules.**
- Dr. Emilio Pérez Álvarez. Research Fellow. (Ramón y Cajal Program 2008) **Molecular Nanoscience: Design and Synthesis of Functionalized Organic Molecules.**
- Dr. Juan Luis Delgado de la Cruz. Research Fellow. (Ramón y Cajal Program 2008). **Molecular Nanoscience: Design and Synthesis of Molecular Nanostructures and Nanomaterials.**

IMDEA Nanociencia Associate Scientists

- Prof. Nicolás Agraït de la Puente. UAM. Senior Researcher. **Nanoelectronics and Superconductivity at the Nanoscale: Electric Transport in Nanosystems.**
- Dr. Amadeo L. Vázquez de Parga. UAM. Senior Researcher. **Scanning Probe Microscopies and Surfaces: 4K UHV STM Inelastic Spectroscopy.**
- Dr. Marisela Vélez Tirado. Senior Researcher. CSIC. **Biomachines and Manipulation of Macromolecules: Biomembranes.**
- Dr. Julio Camarero de Diego UAM. Researcher. **Nanomagnetism: Magnetic Materials: Growth and Characterization of Magnetic Nanomaterials.**
- Dr. Roberto Otero Martín. UAM. Researcher. **Scanning Probe Microscopies and Surfaces: Atomic and Molecular Self-assembly at Surfaces.**

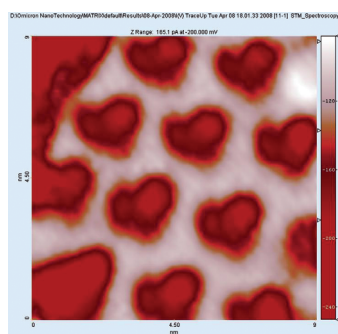
Scientific Report
Memoria Scientifica
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nanoscience
2007-2008

2007

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2. An Organic Donor/Acceptor Lateral Superlattice at Nanoscale, R. Otero, D. Ecija, G. Fernández, J.M. Gallego, L. Sánchez, N. Martín, and R. Miranda, *Nano Letters.*, 2007, **7**, 2602.
3. Self-Organized Hexagonal Patterns of Independent Magnetic Nanodots, T. Bobek, N. Mikuszeit, J. Camarero, S. Kyrsta, L. Yang, M.A. Niño, C. Hofer, L. Gridneva, D. Arvanitis, R. Miranda, J.J. de Miguel, C. Teichert, and H. Kurz, *Adv. Mater.*, 2007, **19**, 4375.
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2008

1. Elementary Structural Motifs in a Random Network of Cytosine Adsorbed on a Gold(111) Surface, R. Otero, M. Lukas, R.E.A. Kelly, W. Xu, E. Lægsgaard, I. Stensgaard, L.N. Kantorovich, F. Besenbacher, *Science*, 2008, **319**, 312.
2. Periodically Rippled Graphene: Growth and Spatially Resolved Electronic Structure, A.L. Vázquez de Parga, F. Calleja, B. Borca, M.C.G. Passegu, J.J. Hinarejos, F. Guinea and N. Martín, and R. Miranda, *Phys. Rev. Lett.*, 2008, **100**, 056802.
3. Symmetry Breaking Effects in Epitaxial Magnetic Thin Films: Nonsymmetric Reversal and Butterfly Remanence Behaviour, David Ecija, Erika Jiménez, Nikolai Mikuszeit, Nicolás Sacristán, Julio Camarero, Jose María Gallego, Jan Vogel and Rodolfo Miranda, *Physical Review B*, 2008, **77**, 024426.
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11. Molecular Conformation, Organizational Chirality, and Iron Metalation of Meso-Tetramesitylporphyrins on Copper(100), David Ecija, Marta Trelka, Christian Urban, Paula de Mendoza, Eva Mateo-Martí, Celia Rogero, José A. Martín-Gago, Antonio M. Echavarren, Roberto Otero, Jose M. Gallego, and Rodolfo Miranda, *J. Phys. Chem. C* Published on Web 05/21/2008 <http://pubs.acs.org/journals/jpcck/index.html>
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13. Independent Tuning of Electronic Levels in Pentacene by Site-Specific Substitution, B. Milián Medina, J. E. Anthony, J. Gierschner, *Chem Phys Chem* 2008, **9**, 1519.
14. A Quantum-stabilized Mirror for Atoms, D. Barredo, F. Calleja, P. Nieto, J. J. Hinarejos, G. Laurent, A. L. Vázquez de Parga, D. Fariás and R. Miranda, *Adv. Mater.* 2008, **20**, 3492.
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17. Highly Fluorinated Benzobisbenzothiophenes, Y. Wang, S. R. Parkin, J. Gierschner, M. D. Watson, *Org. Lett.*, 2008, **10**, 3307.
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20. Oxidation of 3-Alkyl-substituted 2-Pyrazolino[60]fullerenes: A New Formyl-Containing Building Block for Fullerene Chemistry, Delgado JL, Cardinali F, Espildora E, Torres MR, Langa F, Martín N., *Org. Lett.* 2008, **10**, 3705
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23. Curves Ahead: Molecular Receptors for Fullerenes Based on Concave-Convex Complementarity, Pérez EM, Martín N. *Chem. Soc. Rev.*, 2008, **37**, 1512.

24. Independent Tuning of Electronic Levels in Pentacene by Site-Specific Substitution, B. Milián Medina, J. E. Anthony, J. Gierschner, *ChemPhysChem*. 2008, **9**, 1519.
25. Domain Wall Dynamics and Interlayer Interactions in Magnetic Trilayer Systems Studied by XMCD-PEEM, J. Vogel, W. Kuch, K. Fukumoto, F. Romanens, S. Pizzini, and J. Camarero. *Appl. Phys. A -Materials Science & Processing*, 2008, **92**, 505.
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27. Carbon Supported CdSe Nanocrystals, Beatriz H. Juárez, Michaela Meyns, Alina Chanaewa, Yuxue Cai, Christian Klinker, and Horst Weller, *J. Am. Chem. Soc.*, 2008, **130**, 15282
28. EDOT-type Materials: Planar but not Rigid B. Milián Medina, D. Wasserberg, S. C. J. Meskers, E. Mena-Osteritz, P. Bäuerle, J. Gierschner, *J. Phys. Chem. A* (2008). In print.
29. Quantum Oscillations in Surface Properties A.L. Vazquez de Parga, J.J. Hinarejos, F. Calleja, J. Camarero, R. Otero, and R. Miranda *Surface Science* (2008). In print.
30. Spectroscopic Signatures for Planar Equilibrium Geometries in Methyl-Substituted Oligothiophenes G. Macchi, B. Milián Medina, M. Zambianchi, R. Tubino, J. Cornil, G. Barbarella, J. Gierschner, F. Meinardi, *Phys.Chem.Chem.Phys.* (2008). In print.
31. Conformational Disorder and Ultrafast Exciton Relaxation in PPV-family Conjugated Polymers BT. E. Dykstra, E. Hennebicq, D. Beljonne, J. Gierschner, G. Claudio, E. R. Bittner, J. Knoester, G. D. Scholes, *J. Phys. Chem.* (2009) accepted.

4. INTERNATIONAL CONGRESSES

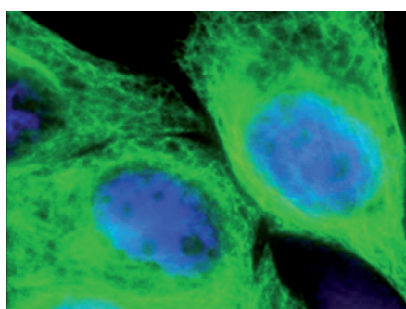
i. INVITED TALKS

06/01/ 2007

- **The Fred Wudl 65 Birthday Symposium. University of Los Angeles, USA**
- *Tetrathiafulvalene (TTF) in the Fullerenes Wonderland*. Prof. Nazario Martín.

08/05/ 2007

- **211th Meeting of The Electrochemical Society. Chicago, USA**
- *Supramolecular Assembly of Tetrathiafulvalene-type Architectures with Fullerenes and SWNTs*. Prof. Nazario Martín.



25-26/06/ 2007

- **Workshop on Magnetic Nanosystems for Biotechnology and Medicine. Madrid, Spain**
- *Towards large-scale arrays of magnetic nanostructures by self-organization processes.* Dr. J. Camarero.

23/07/ 2007

- **International Symposium on Novel Aromatic Compounds (ISNA-12). Awaji Island, Japan.**
- *Donor-Acceptor Concave-Convex Supramolecular Systems.* Prof. Nazario Martín.

08/11/ 2007

- **The 4th World Congress on Biomimetics, Artificial Muscles and NanoBio. Cartagena, Spain.**
- *Mimicking Photosynthesis: Applications to Optoelectronic Devices.* Prof. Nazario Martín.

2008

13/03/ 2008

- **International Conference on Science and Technology of Synthetic Metals. Tsukuba, Japan.**
- *Synthesis of Novel C60-Based Acceptor Dyads (A1-A2) from Sultines.* Prof. Nazario Martín.

14/03/ 2008

- **International Symposium on Photofunctional Devices. Osaka, Japan.**
- *Electroactive Concave-Convex Supramolecular Architectures.* Prof. Nazario Martín.

01/05/ 2008

- **International Conference on Thin Films. San Diego, California, USA.**
- *A direct view of quantum-stabilized atomically flat films.* Prof. Rodolfo Miranda.

12-23/05/ 2008

- **Quantum Coherence and Controllability at the Mesoscale, Donostia International Physics Center, San Sebastián, Spain.**
- *Ultralong Natural Graphene Nanoribbons.* Prof. Nicolás Agrait.

20/05/ 2008

- **Molecular and Supramolecular Chemistry of Fullerenes the Electrochemical Society Phoenix (Arizona).**
- *Self-organizing Electroactive Concave-convex Supramolecular Polymer and Dendrimers.* Prof. Nazario Martín.



09-13/06/ 2008

- **NanoBioEurope, Barcelona, Spain.**
- *Mechanical Stability of Ethanol-induced A-DNA.* Dr. Ricardo Arias González.

12/06/ 2008

- **XXI Encontro Nacional da Sociedade Portuguesa de Química. Porto. Portugal.**
- *When Curves Meet Themselves Concave-convex Supramolecular Architectures.* Prof. Nazario Martín.

21-25/07/ 2008

- **XRM2008 (X-Ray Microscopy 2008), 21-25 Julio, Zürich (Suiza).**
- *Scanning Tunneling Microscopy Investigations on the Self-Assembly of Bioinspired Molecular Nanostructures.* Dr. Roberto Otero.

01/08/ 2008

- **25th European Conference on Surface Science (ECOSS-2008). Liverpool, Great Britain.**
- *Inelastic electron tunneling spectroscopy in single alkanedithiol molecules.* Prof. Nicolás Agrait.

26/09/ 2008

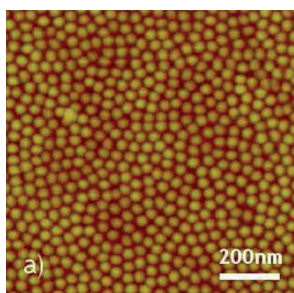
- **Symposium "Twenty Years of Quantum-Chemistry in Mons" University of Mons-Hainaut, Belgium.**
- *3D Energy Transport in Supramolecular Assemblies* Dr. Johannes Gierschner.

03-05/11/ 2008

- **NanoSWEC (Nano South-West European Conference, 1st edition), Bordeaux, France.**
- *Surface engineering and self-assembly of molecular nanostructures relevant for photovoltaics.* Dr. Roberto Otero.

22-27/11/ 2008

- **European Science Foundation Conference on "Chemical Control with Electrons and Photons", Innsbruck, Austria.**
- *Interaction between organic donor/acceptor species and metal electrodes studied by STM.* Dr. Roberto Otero.



II. REGULAR CONTRIBUTIONS

2007

11-12/03/ 2007

Oral contribution

- **Symposium on Surface Science 2007. Les Arcs 2000, Savoie, France**
- *Real space direct visualization of the layer-dependent roughening transition in nanometer-thick Pb films.* F. Calleja, M.C.G. Passeggi, Jr., J.J. Hinarejos, A.L. Vázquez de Parga and R. Miranda.

02-06/07/ 2007

Oral contributions

- **IVC-17/ICSS-13 and ICN+T 2007. Stockholm, Sweden.**
- *Role of anisotropies on the asymmetric magnetization reversal behaviour in exchange-biased systems.* E. Jiménez, J. Camarero, J.M. García-Martín, A. Hoffmann, J. Sort, J. Nogués, B. Dieny, and R. Miranda.
- *Non-symmetric reversal and butterfly remanence behaviour in symmetry breaking epitaxial magnetic thin films.* E. Jiménez, D. Ecija, J. Camarero, N. Mikuszeit, J.M. Gallego, J. Vogel, N. Sacristán, and R. Miranda.
- *Quantum oscillation of the apparent step heights in nanometer-thin Pb(111) films grown on Cu(111).* F. Calleja, A.L. Vázquez de Parga, J.J. Hinarejos, J. Camarero, R. Otero, and R. Miranda.
- *Real space direct visualization of the layer-dependent roughening transition in nanometer-thick Pb films* F. Calleja, M.C.G. Passeggi Jr, J.J. Hinarejos, A.L. Vázquez de Parga and R. Miranda.

05-09/07/ 2007

Oral contributions

- **52nd Magnetism and Magnetic Materials Conference 52nd-MMM. Tampa, USA**
- *Asymmetry reversal phenomena in exchange biased systems: role of anisotropies and interfacial magnetic frustration.* E. Jiménez, J. Camarero, N. Mikuszeit, R. Miranda, J.M. García-Martín, J. Sort, J. Nogués, A. Hoffmann, and B. Dieny.
- *Symmetry breaking effects in epitaxial magnetic thin films: non-symmetric reversal and butterfly remanence behaviour.* E. Jiménez, J. Camarero, N. Mikuszeit, D. Ecija, J.M. Gallego, N. Sacristán, J. Vogel, and R. Miranda.

2008

22/02/ 2008

Oral contributions

- **9th National School on Molecular Materials. Peñíscola, Spain.**
- *Energy Transport in Supramolecular Nanostructured Materials.* Dr. Johannes Gierschner.
- *1D ZnO chains as the spinal cord of adsorbed metalloporphyrin nanotubes linked by water ligands.* Prof. Rodolfo Miranda.

02-08/03/ 2008

Oral contribution

- **Symposium on Surface Science 2008. St. Christoph am Arlberg, Austria.**
- *Spatially resolved electronic structure of periodically rippled graphene* A.L. Vázquez de Parga, F. Calleja, B. Borca, M.C.G. Passeggi Jr., J.J. Hinarejos, F. Guinea and R. Miranda. Oral presentation.

14-18/04/ 2008

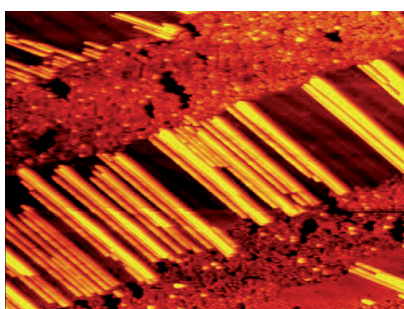
- **NanoSpain 2008 Nanolberian Conference. Braga, Portugal.**

Oral contributions

- *Graphene on Ru(0001): Spatially resolved electronic structure.* A.L. Vázquez de Parga, B. Borca, F. Calleja, M.C.G. Passeggi Jr., J.J. Hinarejos, F. Guinea & R. Miranda.
- *1D ZnO chains as the spinal cord of adsorbed metalloporphyrin nanotubes linked by water ligands.* Marta Trelka, Christian Urban, Celia Rogero, Eva Mateo, Paula de Mendoza, Wang Yang, Iñaki Silanes, Manuel Alcamí, Andrés Arnau, José Ángel Martín Gago, Fernando Martín, Antonio Echavarren, José María Gallego, Roberto Otero & Rodolfo Miranda.
- *Preferential nucleation, molecular distortion, charge transfer, and elastic effects in the self-assembly of TCNQ on Cu(100).* Christian Urban, Marta Trelka, David Écija, Roberto Otero, Rodolfo Miranda, Luis Sánchez, Nazario Martín, Yang Wang, Manuel Alcamí, Fernando Martín, & José M. Gallego.

Posters

- *Understanding the supramolecular self-assembly of the fullerene derivative PCBM on Au(111) surface.* M. Alcamí, D. Écija, R. Otero, L. Sánchez, J. M. Gallego, Y. Wang, F. Martín, N. Martín, R. Miranda..
- *Reactivity of periodically rippled graphene grown on Ru(0001).* B. Borca, F. Calleja, J.J. Hinarejos, A.L. Vázquez de Parga and R. Miranda.
- *Molecular conformation, organizational chirality, and Fe metallation of meso-tetramesitylporphyrins on Cu(100).* David Écija, Marta Trelka, Christian Urban, Roberto Otero, Rodolfo Miranda, Paula de Mendoza, Antonio M. Echavarren.
- *Preferential nucleation, molecular distortion, charge transfer, and elastic effects in the self-assembly of TCNQ on Cu(100).* Christian Urban, Marta Trelka, David Écija, Roberto Otero, Rodolfo Miranda, Luis Sánchez, Nazario Martín, Yang Wang, Manuel Alcamí, Fernando Martín, José M. Gallego Eva Mateo-Martí, Celia Rogero, José A. Martín-Gago, José M. Gallego.
- *Influence of surface coating in the interaction of magnetite nanoparticles with tumoral HeLa cells.* Angeles Villanueva, Magdalena Cañete, María del Puerto Morales, A. G. Roca, C. J. Serna and Rodolfo Miranda.



04-08/05/ 2008

- **IEEE Internacional Magnetism Conference, INTERMAG 2008. Madrid, Spain**

Oral contributions

- *Role of anisotropies on the asymmetric magnetization reversal behavior in exchange-biased system.* J. Camarero; J. Sort; J. Nogués; N. Mikuszeit; J. García-Martín; A. Hoffmann; B. Dieny; R. Miranda.
- *Tailoring the magnetic properties of all-ferromagnetic artificial FeCu(111) alloy thin film.* M. Niño; J. Camarero; W. Kuch; R. Abrudan; N. Mikuszeit; C. Tieg; M. P. Jigato; J. Kirschner; J. de Miguel; R. Miranda.
- *Direct magnetic patterning on paramagnetic FeAl sheets by ion irradiation through poly(methyl methacrylate) and porous alumina shadow masks.* E. Menéndez; J. Sort; E. Jiménez; J. Camarero; O. Liedke; J. Fassbender; D. Baró; S. Suriñach; S. Deevi; K. Rao; A. Weber; L. Heyderman; J. Sommerlatte; K. Nielsch; J. Nogues.
- *On the spin reorientation of magnetic nano-dot arrays: Co/Au versus Co/Pt on SiG A.* Persson; L. Gridneva; M. A. Niño; J. Camarero; J. J. de Miguel; R. Miranda; C. Hofer; C. Teichert; T. Bobek; D. Arvanitis.

Posters

- *Symmetry breaking effects in epitaxial magnetic thin films.* E. Jiménez; N. Mikuszeit; D. Ecija; J. Gallego; N. Sacristán; J. Vogel; J. Camarero; R. Miranda.
- *Nanocrystalline permalloy thin films obtained by nitrogen IBAD.* P. Prieto; J. Camarero; J. F. Marco; E. Jimenez; J. M. Benayas; J. M. Sanz.

26-30/05/ 2008

Oral contribution

- **E-MRS Spring Meeting. Strasbourg, France.**
- *Chromophore and Exciton Dynamics in Supramolecular Nanostructured Host Guest Compounds.* Dr. Johannes Gierschner.

06-11/07/ 2008

Oral contribution

- **International Conference on Science and Technology of Synthetic Metals ICSM 2008, Recife, Brazil**
- *Importance of Long Range Interactions in the Exciton Coupling of Conjugated Organic Materials.* Dr. Johannes Gierschner.

10-13/07/ 2008

Poster

- **1st Portuguese-Spanish-British Joint Biophysics Congress. Lisbon, Portugal.**
- *Mechanical Stability of Ethanol-induced A-DNA* Hormeño, S., B. Ibarra, B., J.M. Valpuesta, J.M., Carrascosa, J.L., and Arias-Gonzalez, J.R.

20-25/07/ 2008

Oral contribution

- **2008 International Conference on Nanoscience+Technology Keystone, Colorado, USA**
- *Spatially resolved electronic structure of periodically rippled graphene* A.L. Vázquez de Parga, B. Borca, F. Calleja, M.C.G. Passeggi, J.J. Hinarejos, F. Guinea y R. Miranda.



27-01/07-08/ 2008

Oral contributions

· **25th European Conference on Surface Science (ECOSS-2008). Liverpool, Great Britain**

- *Atomic stabilized mirror for atoms.* D. Barredo, F. Calleja, P. Nieto, J.J. Hinarejos, G. Laurent, A.L. Vazquez de Parga, D. Fariás y R. Miranda.
- *Spatially resolved electronic structure of periodically rippled graphene* A.L. Vazquez de Parga, F. Calleja, B. Borca, M.C.G. Passeggi, J.J. Hinarejos, F. Guinea y R. Miranda.
- *Molecular conformation, organizational chirality and Fe metallation of meso-tetramesitylporphyrins on Cu(100).* D. Écija, M. Trelka, C. Urban, P. de Mendoza, E. Mateo-Martí, C. Rogero, J.A. Martín-Gago, A. M. Echavarren, R. Otero, J. M. Gallego & R. Miranda.
- *Surface assembly of bio-inspired antenna complexes with 1D zinc-oxygen spinal cords* M. Trelka, C. Urban, C. Rogero, E. Mateo, P. de Mendoza, W. Yang, I. Silanes, M. Alcamí, A. Arnau, J. A. Martín-Gago, F. Martín, A. M. Echavarren, J. M. Gallego, R. Otero & R. Miranda.

14-19/09/ 2008

Oral contributions

· **Joint European Magnetism Symposium, JEMS'08. Dublin, Ireland.**

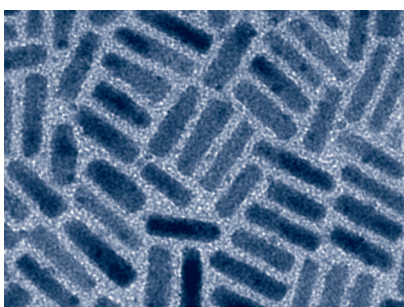
- *Revisiting the asymmetry reversal phenomena in exchange biased systems: role of anisotropies and interfacial magnetic frustration* E. Jiménez, J. Camarero, J. Sort, J. Nogués, J. M. Garcia-Martin, A. Hoffmann, B. Dieny, and R. Miranda.
- *Symmetry breaking effects in epitaxial magnetic thin films: non-symmetric reversal and butterfly remanence behaviour* E. Jiménez, J. Camarero, D. Écija, N. Mikuszeit, J. M. Gallego, J. Vogel, N. Sacristán, and R. Miranda.
- *Tailoring the magnetic properties of all-ferromagnetic artificial FeCu(111) alloy thin films* J. Camarero, J. J. de Miguel; W. Kuch; R. Abrudan; N. Mikuszeit; C. Tieg; J. Kirschner, and R. Miranda.

17-19/11/ 2008

Oral contributions

· **14th International Conference on Thin Films & Reactive Sputtering Deposition (ICTF14). Gante, Belgium.**

- *Spatially resolved electronic structure of periodically rippled graphene* A.L. Vázquez de Parga, B. Borca, F. calleja, M.C.G. Passeggi, J.J. Hinarejos, F. Guinea y R. Miranda.
- *Quantum stabilized mirror for atoms* D. Barredo, F. Calleja, P. Nieto, J.J. Hinarejos, G. Laurent, A.L. Vázquez de Parga, D. Fariás y R. Miranda.



5. SEMINARS & LECTURES

2007

21/07/ 2007

- *Supramolecular Assembly of TTF-type Electron Donor Architectures with Fullerene and Carbon Nanotubes*. Tokyo University, Tokio, Japan. Prof. Nazario Martín. Seminar.

27/07/ 2007

- *The importance of curves in Chemistry*, Fukuo University, Japan. Prof. Nazario Martín. Seminar.

30/11/ 2007

- *Concave TTF-type Architectures and their Self-assembly with Fullerenes*. Groningen University, The Netherlands. Prof. Nazario Martín. Seminar.

10-20/12/ 2007

- *Ingeniería de Materiales a Escala Atómica*. X Curso de Postgrado de Ciencia e Ingeniería de las Superficies de los Materiales Metálicos y de la Corrosión. Madrid, Spain Dr. J. Camarero and Prof. Rodolfo Miranda.

2008

23-25/01/ 2008

- Lecture Series on *Optical Spectroscopy on Organic Materials*, ICMol, Universidad de Valencia, Spain. Dr. Johannes Gierschner. Lecture.

12/02/ 2008 & 17/10/ 2008

- *Máster Interuniversitario en Nanociencia y Nanotecnología Molecular* (Universidades de Alicante, Valencia, Valladolid y Autónoma de Madrid), ICMol. Valencia, Spain.
- *Autoorganización molecular en superficies*. Prof. Rodolfo Miranda.
- *Nanomagnetismo Molecular*. Dr. Julio Camarero.

22/04/ 2008

- *Electrical-Transport Measurements at a Single-Molecule Level* Forschungszentrum Jülich, Jülich, Germany. Dr. M. Teresa González. Seminar.

26-27/04/ 2008

- *Electronic and Optical Properties of Conjugated Materials from Single Chains to Molecular Assemblies*, ICMB, Barcelona, Spain. Dr. Johannes Gierschner. Seminar.
- *Particle Sizing by Dynamic and Static Light Scattering*. Molecular Nanoscience Seminar, ICMB, Barcelona, Spain. Dr. Johannes Gierschner. Seminar.

28/04/ 2008

- *Electroactive Conceve-Convex Supramolecular Architectures* Angstrom Laboratory (University Sweden) Uppsala, Sweden. Prof. Nazario Martín. Seminar.

29/04/ 2008

- *Complementary Geometrical and Electronic Donor-Acceptor Supramolecular Ensembles*. Linköping University, Sweden. Prof. Nazario Martín. Seminar.

26-31/10/ 2008

- First European School on Molecular Nanoscience. Gandía, Spain.
- *Self-assembly of functional molecular nanostructures at surfaces*. Prof. Rodolfo Miranda
- *Solar cells based on fullerenes*. Prof. Nazario Martín.
- *Single-molecule electronics*. Prof. Nicolás Agrait.
- *Exploring nanomagnetism with soft x-rays based techniques*. Dr. Julio Camarero.
- *Single-Molecule Biology*. Dr. Ricardo Arias.

07/11/ 2008

- *Doctoral Program in Molecular and Cell Biology*, Universidad Autónoma de Madrid, Madrid, Spain.
- *Scanning Microscopies in Biomaterials*. Dr. Ricardo Arias.

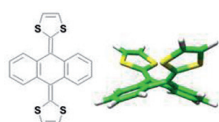
09-12/11/ 2008

- 4th Flash Conference “Modern Chemical Techniques for light harvesting.
- *Supramolecular π,π -interactions in Materials for Photovoltaics*. Prof. Nazario Martin.
- *Surface self-assembly of molecular nanostructures relevant for photovoltaics*. Prof. Rodolfo Miranda.

10, 12, 14 /11/ 2008

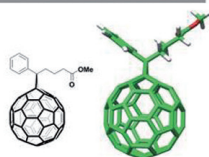
- Department of Materials Science and Engineering, Seoul National University, South Korea
- *Optical & Electronic Properties of Conjugated Organic Materials: from Single Chains to Molecular Assemblies*. Dr. Johannes Gierschner. Seminar.
- *Tutorial: Optical & Electronic Properties of Conjugated Organic Materials*. Dr. Johannes Gierschner. Tutorial.
- *3D Energy Tranport in Supramolecular Assemblies*. Dr. Johannes Gierschner. Seminar.

Electron-Donor



exTTF

Electron-Acceptor



PCBM

11/11/ 2008

- *At the Crossroad of Spectroscopy, Theory and Novel Materials: Optical Excitations and Exciton Processes in Conjugated Organic Materials*. The Korean Institute of Science and Technology (KIST), Seoul, South Korea. Dr. Johannes Gierschner. Seminar.

11-12/ 2008

- *Master in Nanotechnology*, Aliter - Escuela Internacional de Negocios. Madrid.
- *Module: Biotechnology*. Dr. Ricardo Arias.

6. SEMINARS AT IMDEA-NANOCIENCIA

7/07/ 2007

- *Tooling up for the nanoworld: the magic of molecular machines* Prof. David A. Leigh, University of Edinburgh, United Kingdom.

15/10/ 2007

- *At the Crossroad of Spectroscopy, Theory and Novel Materials: Optical Excitations of Polyene-Like Molecules* Dr. Johannes Gierschner, Laboratory for Chemistry of Novel Material, University of Mons-Hainaut, Belgium.

19/10/ 2007

- *Polymer Solar Cells: Why, Status, and Challenges* Prof. René A.J. Janssen Eindhoven, University of Technology Molecular Materials and Nanosystems, The Netherlands.

26/10/ 2007

- *Vibrational Dynamics In Laser-Molecule Interactions* Dr. Thomas Niederhausen, Max Planck Institute, Heidelberg, Germany.

30/10/ 2007

- *Electrical-Transport Measurements On Single Molecules* Dr. M. Teresa González, Institut für Physik, Universität Basel, Switzerland.

22/11/ 2007

- *Molecular Solar Cells* Prof. James R. Durrant, Imperial College London, United Kingdom.

2008

29/02/ 2008

- *Synthesis And Applications of Functionalized Carbon Nanostructures* Prof. Maurizio Prato, Dipartimento di Scienze Farmaceutiche, Università degli Studi di Trieste, Italy.

10/04/ 2008

- *Conjugated Organic Materials for Opto-Electronic Applications: A Quantum-Chemical Approach* Dra. Begoña Milián Medina, Instituto de Ciencia Molecular (ICMOL), Universidad de Valencia, Spain.

9/05/ 2008

- *Nanomaterials And Nanotechnologies: Time To Be Small.* Dr. Vuk Uskoković. Division of Biomaterials and Bioengineering, University of California, San Francisco, USA.

12/05/ 2008

- *Femtosecond Spectroscopy in Low-Dimensional Organic Materials for Optoelectronics* Dr. Larry Lüer, CNR/INFM/ULTRAS, Dipartimento di Fisica. Politecnico di Milano, Milano, Italy.

10/06/ 2008

- *New Progress in Chemistry of Nanocarbons: Endohedral Metallofullerenes* Prof. Takeshi Akasaka. Department of Chemistry. University of Tsukuba. Japan.

16/06/ 2008

- *Oligopyrrole Macrocycles: Receptors for Potentially Hazardous Materials* Prof. Jonathan L. Sessler. Department of Chemistry and Biochemistry, The University of Texas at Austin, USA.

05/09/ 2008

- *Inyección y detección eléctrica de spin en válvulas de spin laterales* Dr. Fèlix Casanova. Physics Department, University of California - San Diego, La Jolla, CA (USA).

26/09/ 2008

- *Cracking the tube: towards understanding carbon nanotube growth.* Dra. Teresa de los Arcos, ESCA Group, Department of Physics, Basel University, Switzerland.

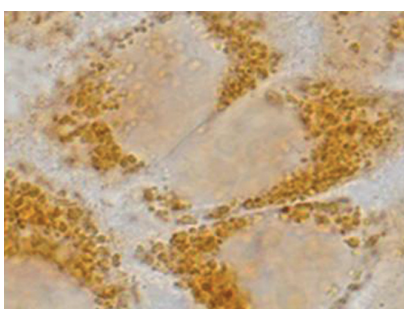
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30/09/ 2008

- *Modificaciones Químicas en ARN de Interferencia: desde la investigación básica hacia las aplicaciones terapéuticas* Dr. Alvaro Somoza. Institute for Research in Biomedicine. Chemistry and Molecular Pharmacology Parc Científic de Barcelona.
- *De compuestos organometálicos a nanopartículas. Síntesis, caracterización y estudio de su reactividad* Dra. María Bernechea. Departamento de Química Inorgánica. Facultad de Química. Universidad de Alcalá.

14/10/ 2008

- *Unconventional lasing from nanostructured materials* Dr. Riccardo Sapienza. ICFO-The Institute of Photonic Sciences & Instituto de Ciencia de Materiales – CSIC



17/10/ 2008

- *Photonic crystal nanocavities for quantum information applications: From the weak to the strong coupling regime* Dr Daniel Granados Quantum Information Group Toshiba Research Europe Limited Cambridge Science Park Laboratory 208 Science Park, Milton Road CB4 0WE, Cambridge, UK
- *Can pristine semiconducting oxides be ferromagnetic?* Dr. Nguyen Hoa Hong Laboratoire LEMA, UMR 6157 CNRS, Université François Rabelais, Parc de Grandmont, 37200 Tours, France

21/10/ 2008

- *Optical manipulation for high spatial and temporal resolution biophysics* Dr. Dan Cojoc. CNR-INFM, National Laboratory TASC, Trieste, Italy.

22/10/ 2008

- *Manganite thin films and artificial interfaces growth and fundamental properties* Dr. Paolo Perna CNR-INFM CRS Coherencia Naples and Department of Physics University "Federico II" of Naples, Italy.

23/10/ 2008

- *Monitoring fundamental processes in organic based devices with femtosecond pump-probe spectroscopy.* Dr. Juan Cabanillas González Dipartimento di Fisica, Politecnico di Milano, Italy

03/11/ 2008

- *Protein design for nano-biology applications* Dra. Aitziber López Cortajarena Dept. Molecular Biophysics & Biochemistry Yale University New Haven USA.

04/11/ 2008

- *Novel Fullerene Soft-Materials Based on Supramolecular Sciences* Prof. Takashi Nakanishi Max Planck Institute of Colloids and Interfaces, Potsdam, Germany

06/11/ 2008

- *Optics and Acoustics of Nanostructures.* Dr. Reinhold Wannemacher Fakultät für Physik und Geowissenschaften Universität Leipzig Leipzig, Germany

17/11/ 2008

- *Nanotechnology activities in Canada, Alberta and at the National Institute for Nanotechnology.* Prof. O. Petersen Director General, National Research Council of Canada; Professor of Chemistry, University of Alberta; National Institute for Nanotechnology, Edmonton, Alberta, Canada.

20/11/ 2008

- *Probing surface chemical bonds in alkali-doped single-crystal and bimetallic surfaces by electron energy loss spectroscopy.* Antonio Politano Università degli Studi della Calabria Dipartimento di Fisica Cosenza, Italy.

24/11/ 2008

- *Probing Superconductivity and Magnetism down to atomic scale* Dr. María Iavarone Materials Science, Division Argonne National Laboratory, Argonne, IL, USA

28/11/ 2008

- *Surface-supported molecular nanostructures* Prof. Roman Fasel Empa, Swiss Federal Laboratories for Materials Testing and Research, nanotech@surfaces Laboratory, Dübendorf / Thun, Switzerland; and Department of Chemistry and Biochemistry, University of Bern.

7. SCIENTIFIC OUTREACH ACTIVITIES

i. TALKS

2007

25/04/ 2007

- *Transferencia electrónica en sistemas supramoleculares de fullerenos*, Universidad de Valencia, Spain. Prof. Nazario Martín. Seminar.

03/05/ 2007

- *Fullerenos: Nuevas Moléculas para la medicina*, Universidad de Zaragoza, Spain. Prof. Nazario Martín. Seminar.

20/05/ 2007

- *Fullerenos y Nanotubos de Carbono*. VIII Escuela Nacional de Materiales Moleculares. Estepona, Spain. Prof. Nazario Martín. Seminar.

25/06/ 2007

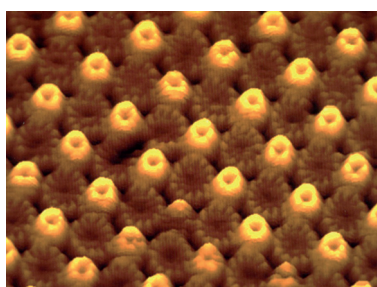
- *Luces y sombras de la Nanomedicina en España*. XX Edición de Cursos de verano. El Escorial, Spain. Prof. Nazario Martín.

07/07/ 2007

- *Nanociencia y Nanotecnología: Las Ciencias emergentes del S. XXI*, Universidad de Valladolid, Spain. Prof. Nazario Martín.

15/11/ 2007

- *Moléculas de carbono para la tecnología del s. XXI*. Universidad de la Rioja, Spain. Prof. Nazario Martín.



2008

21/02/ 2008

- *Nanociencia: lo pequeño es diferente*. Science Talks in High-Schools. Madrid. Prof. Rodolfo Miranda

08/04/ 2008

- *Nanociencia: la magia de lo pequeño*. Science Talks in High-Schools. Segovia. Prof. Rodolfo Miranda

09/04/ 2008

- *Fullerenos: Nanoestructuras de Carbono para Células Fotovoltaicas*. Universidad de Málaga, Spain. Prof. Nazario Martín.

10/04/ 2008

- *Química Supramolecular en Nanoestructuras de Carbono*. Universidad de Oviedo, Spain. Prof. Nazario Martín.

14-18/04/ 2008

- *IMDEA-Nanociencia: A New Institute Devoted to Research in Nanoscience and Nanotechnology in Madrid*. NanoSpain 2008 Nanolberian Conference Braga, Portugal. Prof. Rodolfo Miranda.

04/07/ 2008

- *Fullerenos y Nanotubos de Carbono para Electrónica Molecular Orgánica*. U Carlos III, Madrid. Spain. Prof. Nazario Martín

16-17/07/ 2008

- XXI Edición de Cursos de Verano, El Escorial, Spain
- *Iniciación a la Nanociencia Molecular*. Prof. Nazario Martín.
- *Microscopía y Espectroscopia de moléculas individuales*. Prof. Miranda
- *Electrónica molecular: dispositivos electrónicos unimoleculares*. Prof. Nicolás Agrait.

24/07/ 2008

- *Moléculas con curvas: Interacciones supramoleculares concavo-convexo*. Universidad de Santiago de Compostela, Santiago de Compostela, Spain. Prof. Nazario Martín

25/07/ 2008

- *The Chemistry of the 21 st Century. State of the Art*. UIMP, Santander, Spain. Prof. Nazario Martín

18-22/08/ 2008

- *El oficio de investigador. ¿Qué se espera de un investigador de hoy?* Escuela de Iniciación a la Investigación “Blas Cabrera”. UIMP, Santander, Spain. Prof. Rodolfo Miranda.

04/11/ 2008

- Hybrid Materials for Future Solar Cells. <http://www.alphagalileo.org/>. Dr. Beatriz. H. Juárez

ii. OUTREACHING ACTIVITIES

2007

12-15/04/ 2007

- VIII Feria Madrid por la Ciencia.

27/04/ 2007

- Jornadas REDIMadrid. (IMDEA-Nanociencia Director's conference).

12-15/11/ 2007

- VII Semana de la Ciencia (IMDEA-Nanociencia guided tour for high schools).

14/12/ 2007

- Presentation of the Madrid Institute for Advanced Studies in Nanoscience at the Universidad Complutense de Madrid.

2008

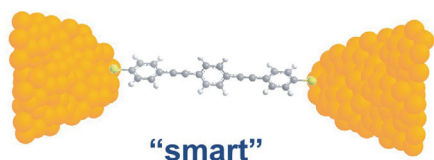
25/01/ 2008

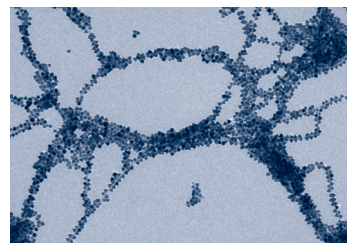
- Inauguration of the provisional site of IMDEA-Nanociencia in the Facultad de Ciencias, Universidad Autónoma de Madrid.

13-15/02/ 2008.

- 1st Spanish Pavilion at Nanotech 2008, Tokio Japan. (IMDEA-Nanociencia participates with 12 Spanish companies and research centres).

electrode — molecule — electrode





24-27/04/ 2008

- IX Feria Madrid por la Ciencia. Stand of IMDEA Nanociencia Institute.

06/05/ 2008

- Delegation of the Commercial Office of Taiwan and Director of the Centre for East Asian Studies (CEAO) UAM. IMDEA-Nanociencia guided tour.

06-07/10/ 2008

- *Seminario Hispano-Noruego de Tecnología de Materiales.* Prof. Rodolfo Miranda.

20-23/10/ 2008

- *UK Nanoforum 2008 Conference London.* Prof. Rodolfo Miranda.

24/10/ 2008

- *Foros de Ciencia y Tecnología. Foro Nuevos Materiales y Nanotecnología Jornada Ciencia Empresa.* Jornada de Presentación de IMDEAs y Presentación del Catálogo de Materiales y Nanotecnología. CSIC. Madrid. Prof. Rodolfo Miranda.

04/11/ 2008

- Inaguration of the Molecular Organic Material Laboratory, associate to IMDEA-Nanociencia. Facultad de Ciencias Químicas, Universidad Complutense de Madrid.

14/11/ 2008

- *11th Asia-Europe Young Leaders Symposium Madrid, Spain.* Technical Visits: Research and technological development in Madrid. Prof. Rodolfo Miranda

18-19/11/ 2008

- *Foro de Innovación-La Rioja 2008 Logroño, Spain.* Prof. A.L. Vázquez de Parga.

18/11/ 2008

- *Nanobusiness-Sevilla 2008.* Prof. Nazario Martín and Dr. Roberto Otero.

13, 21/11/ 2008

- VIII Semana de la Ciencia (IMDEA-Nanociencia guided tour for high schools).

8. WORKSHOPS & COURSES (CO)-ORGANIZED BY IMDEA-NANOCIENCIA

2007

16-21/06/ 2007

- *Workshop on Nanomedicine*. Madrid.

16-21/09/ 2007

- *XIV International Summer School Nicolás Cabrera*. Nano-Photonics and Optics. Madrid.

2008

04-08/05/ 2008

- INTERMAG 2008 Conference. Madrid. (IMDEA-Nanociencia collaborates as partner).

16-17/07/ 2008

- *Iniciación a la Nanociencia Molecular*. XXI Edición de Cursos de verano. El Escorial, Spain.

14-19/09/ 2008

- *XV International Summer School Nicolás Cabrera*. Frontiers in Science and Technology: 100 Years with Liquid Helium: New Physics at the Edge of Absolute Zero. Madrid.

9. RECRUITMENT OF RESEARCHES

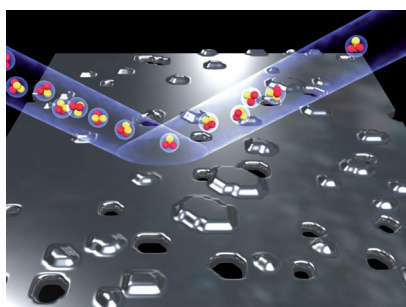
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2007

- International Open Call 2007: 108 applications.

2008

- International Open Call 2008: 110 applications.
- International Open Call for predoctoral positions 2008: 63 applications.
- International Open Call for postdoctoral positions 2008: open.



10. RESEARCH PROGRAMMES & FELLOWSHIPS

2007

- Initiation to Research in Nanoscience. Summer 2007. 12 Three-months grants awarded to students.
- Ramón y Cajal Programme 2007. 3 five-year contracts signed.

2008

- Initiation to Research in Nanoscience. 2008. 9 Three-months grants awarded to students.
- Ramón y Cajal Programme 2008: 3 five-year contracts signed.
- 7th Research Framework Program. People Program. Marie Curie Actions. Co-funding of Regional, National and International Programs (COFUND). Call: FP7-PEOPLE- 2007-2-3-COFUND AMAROUT EUROPE. The agreement is being negotiated. Estimated date for the Call: 1st February 2009.

11. PROJECTS

2008

NanoSci-ERA. Two proposals have passed the first selection round.

12. EXTERNAL CONTRACTS

2008

With AERnova AEROSPACE S.A. <http://www.aernnova.com>

- Consejería de Innovación Tecnológica de la Comunidad de Madrid. *Superficial Nano-Engineering in Passived Thermal Shields for Planetary Reincome*. 1 year contract.
- Ministerio de Industria, Turismo y Comercio. Proyecto CENIT. *Innovation in Advanced Composites and Rear-End Optimized (ICARO)*. 4 years contract.

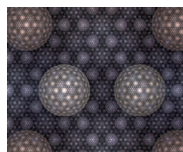
13. HONORS

2007

- Prof. Nazario Martín. Premio Du Pont de la Ciencia 2007.

2008

- Prof. Rodolfo Miranda. Fellow of the American Physical Society. April 2008.
- Prof. Rodolfo Miranda. Spanish Delegate in the Working Party on Nanotechnology of the OECD.



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nanociencia

