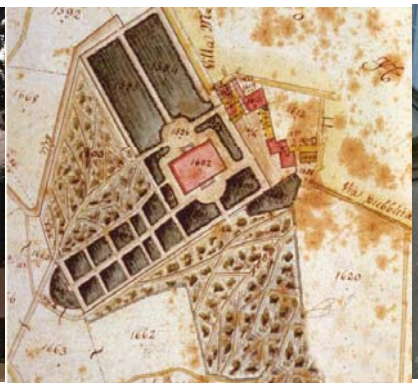
CNRNANO

ISTITUTO NANOSCIENZE CONSIGLIO NAZIONALE DELLE RICERCHE

First Meeting of the Institute of Nanoscience

Villa Guinigi, Matraia (Capannori, LU)
4-5 October 2010



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CNRNANO PISA NEST

CNRNANO LECCE NNL

CNRNANO MODENA S3

First Meeting of the Institute of Nanoscience-CNR
October 4-5, 2010
Matraia (Capannori, LU) | Italy

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PRESENTATION

This booklet includes the program, the list of participants, and the posters presented at the First Meeting of the Institute of Nanoscience of the National Research Council that takes place in Villa Guinigi, Matraia (Capannori, LU) on October 4-5, 2010.

The recently established Institute of Nanoscience includes three centers: NEST (Pisa), NNL (Lecce), and S3 (Modena), and its scientific activities span from the comprehension of physical phenomena on the nanometric scale to their use for technological innovation.

The Institute consists of 49 CNR staff researchers, 5 technologists, 18 technicians, 65 university associates and 6 employees working in the administration. Furthermore, a large number of post-docs and PhD students are participating in the scientific activities of the Institute creating a dynamical and young atmosphere.

A peculiar characteristic of the Institute is the strong scientific collaboration with Universities, Research Centers, and Italian and foreign companies. Although there are already several established collaborations between the researchers of the three centers, we hope that this meeting will strengthen the collaborations. Furthermore, the discussions between researchers will also give rise to new common activities.

The program of the meeting includes a number of presentations describing the activities carried out in the three centers. In addition, we have selected three examples of emerging research topics. A large number of posters will offer the opportunity to the participants to present and discuss their activities.

Pisa, September 24, 2010

Lucia Sorba
Director of the Institute of Nanoscience-CNR

PROGRAM

MONDAY OCTOBER 4, 2010

9:00-10:00	*BREAKFAST AND REGISTRATION*
10:00-10:20	**PRESENTATION OF THE ISTITUTO NANOSCIENZE** (L. SORBA)
10:20-11:00	**PRESENTATION BY L. MAIANI** (CNR PRESIDENT) AND DISCUSSION
	PRESENTATION OF THREE EMERGING RESEARCH TOPICS
11:00- 11:15	V. Pellegrini, *Atom-based Nanotechnology*
11:15-11:30	S. Corni, *Protein-surface interactions*
11:30-11:45	D. Sanvitto, *Bose-Einstein condensates in semiconductors*
11:05-12:45	**PRESENTATION BY M. INGUSCIO** (DIRECTOR OF CNR DEPARTMENT "MATERIALI E DISPOSITIVI") AND DISCUSSION
12:45-14:00	*LIGHT LUNCH*
	PRESENTATION OF ACTIVITIES AT NEST
14:00-14:15	A. Tredicucci, *Quantum engineering of photonic devices*
14:15-14:30	M. Polini, *Two-dimensional electron liquids: from graphene to heterostructured semiconductors*
14:30-14:45	F. Giazotto, *Quantum electron and heat transport in nanostructures*
14:45-15:00	G. M. Ratto, *Biophysics @ NEST: from molecule to the living animal*
	PRESENTATION OF ACTIVITIES AT NNL
15:00-15:15	G. Gigli, *Molecular nanotechnology*
15:15-15:30	R. Rinaldi, *Nanotechnology for life sciences*
15:30-15:45	A. Athanassiou, *Nanocomposites*
15:45-16:00	A. Passaseo, *Nanotechnology applied to semiconductors, oxides and insulators*
16:00-16:15	F. Della Sala, *Development of methods of density functional theory for the study of metal-organic interfaces*
16:15-16:45	*COFFEE BREAK*
	PRESENTATION OF ACTIVITIES AT S3
16:45-17:00	M. Affronte, *Nanomagnetism and spintronics*
17:00-17:15	R. Di Felice, *Theory and simulation of nanosystems*
17:15-17:30	P. Facci, *Nanobiophysics*
17:30-17:45	S. Valeri, *Nanomech and nanofab*
18:00-20:00	**POSTER SESSION (PART I)**
20:30	*DINNER*

TUESDAY OCTOBER 5, 2010

8:30-09:00	*BREAKFAST/COFFE BREAK*
9:00-10:30	**POSTER SESSION (PART II)**
10:30-13:00	**PRESENTATION OF THE WEBSITE AND GROUP DISCUSSION**
13:00-14:00	*LIGHT LUNCH*
14:00-16:00	**GENERAL DISCUSSION AND CONCLUSIONS**
16:30-19:00	**MEETING OF THE INSTITUTE COUNCIL**
20:00	*DINNER*

List of Posters

Posters are mainly ordered according to the surname of the presenting author who is underlined.

1 NEST
A. K. Agarwal, A. Principi, R. Fazio, M. I. Katsnelson, M. Polini, and G. Vignale
Spin response of 2D spin-orbit coupled electron gases and graphene

2 S3
A. Alessandrini, P. S. D'Agostino, and P. Facci
Towards receptor mapping with Magnetic Atomic Force Microscopy

3 NNL
A. Aloisi, R. Di Corato, M. Corti, M. Bonora, M. Mariani, A. Lascialfari, M. Moscardini, A. Barca, T. Verri, T. Pellegrino, and R. Rinaldi
Imaging Biophysical Topics: from Stem Cells Labeling and Tracking, to Amyloid Fibrils Self-Assembly Inhibition

4 NNL
P. Andreozzi, C. Centrone, G. C. Anyfantis, M. Casavola, R. Cingolani, and P. D. Cozzoli
Size, Shape and Compositional Control of Colloidal Magnetic Nano(hetero)

5 S3
P. Arosio, M. Corti, M. Mariani, F. Orsini, H. Amiri, T. Kalaivani, K. P. V. Sabareesh, and A. Lascialfari
Magnetic nanostructures from fundamental physics to Biomedical applications

6 S3
V. Bellini, T. B. Faust, G. A. Timco, G. Lorusso, A. Candini, F. Tuna, E. J. L. McInnes, R. G. Pritchard, S. J. Teat, W. Wernsdorfer, M. Affronte, and R. E. P. Winpenny
Propagation of spin information at supra-molecular scale through hetero-aromatic linkers

7 S3
E. Benassi, S. Pipolo, G. Brancolini, and S. Corni
Modelling SAMs of azo-Benzene Derivatives for Nano-Optomechanical Applications

8 S3
S. Benedetti, A. di Bona, and S. Valeri
Metal/oxide systems for plasmonic and photocatalysis

9 S3
A. Bertoni, G. Ferrari, and G. Goldoni
Carrier states in core-multishell nanowires

10 NNL
M. Biasiucci, I. Viola, A. M. L. Coluccia, B. Dozza, E. Lucarelli, E. Fabiano, C. Bettini, G. Barbarella, and G. Gigli
Cell-mediated innovative materials. Physiologically secreted nanostructured and fluorescent fibrils with tuned electro-mechanical properties

11 NNL
L. Blasi
Applications of stimuli-responsive polymers in the controlled uptake and release of fluorescent biomolecules. New perspectives in biomedical diagnostics

12 S3
F. Buscemi, E. Piccinini, P. Bordone, R. Brunetti, and C. Jacoboni
Theory of electron transport in semiconductors

13 NEST
M. Brondi and S. Sulis Stato
A window with a view: sensing physiological function at the two photon microscope in the living animal

14 S3
M. Brucale, D. Aioanei, I. Tessari, E. Miho, L. Bubacco, and B. Samorì
Single-molecule level proof of osmolyte-induced Protein stabilization

15 S3
M. Caiazzo, A. Alessandrini, and P. Facci
Electrical drive of biological reaction

16 S3
A. Calzolari *et al.*
Molecular overlayers at metal surfaces: hybrid interfaces for optoelectronic devices

17 NNL
A. Camposeo, S. Pagliara, F. di Benedetto, A. Polini, E. Mele, L. Persano, R. Cingolani, and D. Pisignano
Electrospun nanofibres for photonics and bioengineering

18 S3
A. Candini, C. Alvino, W. Wernsdorfer, and M. Affronte
Hybrid graphene-molecular magnet devices for spintronics

19 NNL
L. Carbone, Y. Xie, C. Nobile, V. Grillo, C. Giannini, R. Cingolani, and P. D. Cozzoli
Semiconductor-based Nanocrystals and Heterostructures

20 NEST
F. Carillo, P. Papari, D. Stornaiuolo, D. Montemurro, G. M. De Luca, M. Salluzzo, P. Pingue, F. Tafuri, and F. Beltram
High Temperature Superconductors at the nano-scale: coherence, electronic phases and flux states

21 NNL
A. Scrascia, C. Carlucci, M. Manca, G. Gigli, and G. Ciccarella
Design and synthesis of new organic dyes for dye-sensitized solar cells

22 NEST
M. Cecchini, D. Arosio, and F. Ricci
Biosensor-based assay for high-throughput quantitative screening of chloride transport

23 S3
P. O. Heidarsson, M. R. Otazo, B. B. Kragelund, F. M. Poulsen, and C. Cecconi
Studying protein folding at single molecule level using optical tweezers

24 NNL
C. Carlucci, G. Melcarne, L. De Marco, M. Manca, G. Gigli, B. Scremin, and G. Ciccarella
Surfactant-free synthesis of pure anatase TiO_2 nanorods suitable for dye-sensitized solar cells

25 S3
V. Corradini, A. Ghirri, G. Lorusso, U. del Pennino, R. Biagi, V. De Renzi, V. Bellini, S. Carretta, P. Santini, G. C. Cezar, G. Timco, R. E. P. Winpenny, and M. Affronte
Successful grafting of molecular Nanomagnets on Au(111) and HOPG surfaces

26 NNL P. Andreozzi, F. Pignatelli, C. La Tegola, G. C. Anyfantis, A. Athanassiou, R. Cingolani, and P. D. Cozzoli
Studies and Applications of Magnetic Nanocrystals

27 S3 S. D'Addato and S. Valeri
Fabrication and study of mass-selected of metal/metal oxide nanoparticles

28 NNL M. De Giorgi, G. Morello, L. Carbone, F. Della Sala, L. Manna, and R. Cingolani
Theoretical and experimental study of semiconductor nanocrystals

29 S3 E. Degoli, I. Marri, N. Spallanzani, M. Amato, R. Guerra, M. Govoni, M. Bertocchi, and S. Ossicini
Semiconductor nanostructures for photovoltaic applications

30 NNL L. L. Del Mercato *et al.*
Synthesis of multifunctional systems and nanoscale sensing techniques for bio- and medical applications

31 S3 V. De Renzi, G. Arnaud, U. del Pennino, G. C. Gazzadi, and G. Paolicelli
Hybrid organic/inorganic interfaces: electronic and structural properties

32 NEST G. De Simoni, A. Singha, M. Gibertini, B. Karmakar, M. Polini, V. Piazza, L. N. Pfeiffer, K. W. West, F. Beltram, and V. Pellegrini
Novel quantum phases of electrons in artificial graphene

33 S3 A di Bona, P. Luches, and S. Valeri
Exchange coupled metal/metal and metal/oxide magnetic systems

34 S3 R. Di Felice T. Ghane, G. Brancolini, A. Calzolari, A. Garbesi, E. Molinari, S. Corni, D. Varsano, and A. Migliore
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35 NEST A. Arcangeli, R. Faoro, D. Parisi, J. Z. Zhang, A. Di Lieto, A. Toncelli, S. Veronesi, and M. Tonelli
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36 NNL E. Fabiano, M. Piacenza, S. D'Agostino, L. A. Constantin, and F. Della Sala
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37 NEST R. Farchioni, G. Grosso, and G. Pastori Parravicini
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38 NEST A. Gamucci, V. Pellegrini, L. Sorba, M. Rontani, G. Goldoni, E. Molinari, A. Pinczuk, L. N. Pfeiffer, K. W. West, A. Singha, and G. Biasiol
Optical spectroscopy of few electrons in nanofabricated GaAs quantum dots

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NEST *Spin transistor made of quantum Hall edge channels*

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49 M. Manca *et al.*
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50 M. Mazzeo *et al.*
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53 S3
G. Paolicelli, M. Rovatti, and S. Valeri
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54 NNL
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55 NEST
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79 NNL
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80 S. Valeri *et al.*
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81 A. Arcangeli, R. Faoro, A. Di Lieto, A. Toncelli, S. Veronesi, and M. Tonelli
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82 A. Vezzani *et al.*
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83 M. R. Belviso, V. Videtta, G. Caputo, E. Carlino, V. Grillo, C. Giannini, R. Cingolani, and P. D. Cozzoli
NNL *Colloidal Engineering of TiO_2 based nano (hetero)structures*

84 M. Virgilio *et al.*
NEST *Bound to bound conduction intersubband transitions in Ge/SiGe MQWs: experiment and modelling*

85 S. Zanotto, L. Sorba, R. Degl'Innocenti, and A. Tredicucci
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86 V. Arima, M. Bianco, L. Marra, E. Perrone, A. Zacheo, A. Zizzari, and R. Rinaldi
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87 A. Della Torre, G. Maruccio, E. Primiceri, S. Chiriacò, C. Monaco, E. Marulli, V. Arima, and R. Rinaldi
NNL *Lab on chip for genomics, proteomics and cellomics*

88 G. Maruccio, P. Marzo, C. L. Indira, S. Kumar, S.Karmakar, R. Krahne, V. Arima, T. Della Torre, R. Cingolani, and R. Rinaldi
NNL *Nano- and molecular spintronics*

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COMUNE DI CAPANNORI

Capannori Creativa