The accompanying CD ROM contains the one-page abstracts presented at the 22nd General Conference of the Condensed Matter Division of the European Physical Society (CMD-22) held at the Sapienza Università di Roma, Rome, Italy from 25 to 29 August 2008. For copyright information, please see the Copyright Notice (page 2). All abstracts are in .pdf format.

**Instructions**

Software requirements:

A web browser (Firefox, Internet Explorer, Safari or similar)

A .pdf viewer (tested with Adobe Acrobat). This software can be downloaded at no cost from: [http://www.adobe.com](http://www.adobe.com)

**Starting the CD ROM**

The CD ROM has an auto run facility for Windows, and will start when inserted into your computer.

Should you wish to access the contents of the CD ROM other than through the auto run programme, access the CD ROM and click on the start.html icon.

**Navigation**

Navigating the contents of this CD ROM is similar to navigating a web page. The back and forward arrows are active.

The papers on the accompanying CD ROM comprise the digest of the 22nd General Conference of the Condensed Matter Division of the European Physical Society (CMD-22) held at the Sapienza Università di Roma, Rome, Italy. They reflect the authors’ opinion and are published as presented and without any change in the interest of timely dissemination. Their inclusion in this publication does not necessarily constitute endorsement by the editors, the European Physical Society.

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WELCOME to Rome and to the 22nd General Conference of the Condensed Matter Division of the European Physical Society (CMD-22)!

The conference provides a forum for presentations of research work across the full range of condensed matter physics to a wide international audience. It is held every two years since the very first one held in Antwerp in 1980. The format of the meeting will be similar to the most recent ones in the series, held in Prague 2004 and in Dresden 2006.

The conference will also host a special session for the 14th General Conference of the European Physical Society to be held on Wednesday afternoon, 27 August 2008.

The conference programme will include plenary talks, oral sessions including invited and contributed presentations with up to seven parallel sessions, and ample time for poster sessions. The conference should offer space for discussing both novel and established topics, including selected important areas of condensed matter physics.

The conference is dedicated to the memory of the late Co-chair Massimo Sancrotti, Università Cattolica di Brescia, and Laboratorio TASC INFM-CNR Trieste, Italy.

The whole programme will focus on the following sessions:
- Semiconductor Physics
- Surfaces, Interfaces, and Low-Dimensional Physics
- Magnetism
- Superconductivity and Highly-Correlated Systems
- Liquids, Disordered and Off-Equilibrium Systems
- Polymer Physics
- Biological Physics and Life Sciences
- Materials
- Methods for Cultural Heritage and Vacuum Science
- Physics of Socio-Economic and Complex Systems

The conference will also host an exhibition involving international companies.

We hope that you will enjoy the unique beauty of Rome, the programme, and the opportunity to spend time with colleagues from around the globe.

Sincerely,

Lucia Sorba, Scuola Normale Superiore, Pisa and CNR - INFM, Italy
Chair

Carlo Mariani, Sapienza Università di Roma, Rome, and CNR-INFM, Italy
Co-Chair

Eoin O’Reilly, Tyndall National Institute, Cork, Ireland and Chair of the EPS Condensed Matter Division
Co-Chairs
Conference Topics

Semiconductor Physics
1. Quantum dot and wires
2. Photonic crystals
3. Spin-controlled transport
4. Bose-Einstein condensation in semiconductors
5. THz interaction
6. Semiconductor Lasers
7. Theory of electronic structures
8. Transport and optics in high magnetic fields/QHE
9. Ultra-fast phenomena
10. Quantum optics in condensed matter
11. Quantum transport for quantum information
12. Condensed matter with cold atoms
13. Carbon/diamond
15. Graphene: structural stability and dynamics (shared with Materials)
16. Graphite for fusion reactors

Surface, Interface and Low-dimensional Physics
1. Electronic properties of surfaces and low dimensional systems
2. Magnetic properties of surfaces and nanostructures
3. Surface Structure and Dynamics
4. Self-assembled organic layers
5. Spontaneous nanopatterning at surfaces
6. Small particles and clusters
7. Atomic manipulation
8. Tribology and friction
9. Liquid-solid an liquid-gas interfaces
10. Oxide surfaces
11. Organic interfaces and heterostructures
12. Adsorption and reaction on metal and oxide surfaces
13. Adsorption on semiconductors
14. Biological-inorganic interfaces
15. Graphene: electronic properties
16. Nanowires

Magnetism
1. Magneto-electronics and spintronics (GMR, TMR, Hall effect, magneto-impedance, spin transfer torque, spin injection, dynamics), data storage and logic devices (MRAM, spin-torque devices, domain-wall devices)
2. Magnetic nanoparticles and granular materials (nanoparticles, magnetic nanocomposites)
3. Clusters and low dimensional magnetism (Size effect on orbital moment, quantum effects)
4. Magneto-electronic materials (magneto-resistive oxides, multiferric materials, magnetic semiconductors)
5. Strongly correlated electron systems, NFL behavior, coexistence of magnetism and superconductivity
6. Magnetic versus structural and other physical effects associated with magnetic phase transitions (magnetocaloric systems, magnetic phase transitions, phase separation)
7. Structured Materials (ultra-thin films and surface effects, multi-layer films and superlattices, patterned films, nanoparticles and self-assembling)
8. Applications and interdisciplinary topics, magnetic applications in medicine, biomagnetic applications, novel applications

Superconductivity and Highly-Correlated Systems
1. Heavy fermions
2. Quantum critical phenomena
3. High Tc superconductivity
4. New materials with strong correlations
5. Quantum spin systems
6. Theoretical methods for many body computation
7. Spectroscopy: very low and very high energy
8. Electronic properties under extreme conditions
9. Dynamical properties from time-resolved experiments
10. Graphene

Liquids, Disordered and Off-Equilibrium Systems
1. Simple liquids
2. Molecular Liquids
3. Liquid Metals
4. Ionic liquids
5. Quantum Fluids
6. Water and aqueous solutions
7. Hydrogen bonded liquids
8. Liquid crystals
9. Polymers, polyelectrolytes, and biopolymers
10. Colloids
11. Films, foams, and surfactants
12. Confined liquids and interfacial phenomena
13. Supercooled liquids, glass transition, glasses, and gels
14. Off-equilibrium and aging systems: fluctuations and effective temperature
15. Phase transitions, nucleation and heterogeneities
16. Complex rheology
17. Biological and biomimetic fluids
18. Spin glasses
19. Optimisation problems
20. Classical and Quantum glassiness
21. Granular materials and jamming
22. Quenched disorder effects

Polymer Physics
1. Polymer solutions
2. Polyelectrolyte systems
3. Polymer crystallization
4. Polymers at surfaces and interfaces
5. Polymer dynamics in confinement
6. The glass transition of polymer melts
7. Microphase separation in copolymers
8. Polymer-based nano-composites
9. Phase transitions, structure and response of single macromolecules
10. Advanced simulation methods in polymer science
11. Simulations of polymer rheology
12. Polymer conformations under out-of-equilibrium conditions
13. Ordering processes of complex macromolecules

**Biological Physics /Life Sciences**
1. Single bio-molecule
2. Quantum effects in biological systems
3. Biological networks
4. Biophysics of biological membranes
5. Ion and water channels
6. Quantum effects in biological systems
7. Nano-mechanical response of cells
8. Biosensors
9. Force spectroscopy in biology
10. Laser tweezers in biology
11. Optical spectroscopy in biophysics
12. Biological redox systems
13. Biophysical studies of nucleic acids
14. Nanotechnology and stem cells
15. Time-resolved biophysics
16. Biophysics and synchrotron radiation
17. FEL applications to biological systems

**Materials**
1. Carbon nanotubes and spatial ordering in macro/nanostructures.
2. Dynamics of quasicrystals.
4. Pairing symmetry and lattice effects in high-Tc superconductors.
5. Stability and dynamics of graphene (shared with Semiconductor Physics)
7. Fundamental aspects of ferroelectricity.
8. Photo-induced phase transitions.
9. Physical properties of aperiodic crystals

**Methods for Cultural Heritage and Vacuum Science**
1. Chemical and physical methods for characterization of Cultural Heritage Materials (metals, ceramics, glass, etc)
2. Coating and surface treatments for Cultural Heritage conservation
3. Innovative diagnostics techniques
4. Maintenance of the Cultural Heritage: Methodologies and Techniques
5. Nanotechnology and Cultural Heritage
6. Conservation and Restoration of Arts' Heritage (lapidary materials, pictures, ancient papers: drawings and printings, goldsmithery and glyptics, wooden sculptures, mural paintings)
7. The recovery by means of diagnostics
8. Vacuum processes and techniques and Cultural Heritage

**Physics of Socio-Economic and Complex Systems**
1. Agent-based modeling of financial markets
2. Fluctuations and correlations in financial time series
3. Empirical stylized facts of socio-economic systems
4. Models of heterogeneous interacting agents and Minority Games
5. Self-organization in socio-economic systems
6. Optimization problems of microeconomics
7. Static and evolutionary game theory
8. Systemic fragility and risk management
9. Economic growth and cycles
10. Networks in markets, trade and production
11. Agent-based modeling on networks
12. Dynamic processes on socio-economic networks
13. Fluctuation scaling in finance, and socio-economic systems
14. Ecosystems and competitive ecologies
15. Urban systems and traffic modeling
16. Peer-to-peer systems and communication networks
17. Social dynamics, opinion formation and decision making
18. Semiotic and language dynamic

**Poster Sessions**
Poster sessions for contributed papers have been a major attraction at recent conferences. The CMD-22 conference will present over 400 posters split into two poster sessions which will take place on **Tuesday 26 August and on Thursday 28 August 2008. Both sessions are scheduled from 16:30 to 18:40.** There will be no oral presentations during this time.

**Tuesday 26 August 2008 Poster sessions:**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnetism</td>
<td>Rettorato – Main Building</td>
</tr>
<tr>
<td>Semiconductor Physics</td>
<td>Physics Department – Marconi Building</td>
</tr>
<tr>
<td>Surfaces, Interfaces, and Low-Dimensional Physics I</td>
<td>Physics Department – Marconi Building</td>
</tr>
<tr>
<td>Materials</td>
<td>Physics Department – Marconi Building</td>
</tr>
<tr>
<td>Methods for Cultural Heritage and Vacuum Science</td>
<td>Physics Department – Marconi Building</td>
</tr>
</tbody>
</table>

**Thursday 28 August 2008 Poster sessions:**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superconductivity and Highly-Correlated Systems</td>
<td>Rettorato – Main Building</td>
</tr>
<tr>
<td>Surfaces, Interfaces, and Low-Dimensional Physics II</td>
<td>Physics Department – Marconi Building</td>
</tr>
<tr>
<td>Liquids, Disordered and Off-Equilibrium Systems</td>
<td>Physics Department – Marconi Building</td>
</tr>
<tr>
<td>Polymer Physics</td>
<td>Physics Department – Marconi Building</td>
</tr>
</tbody>
</table>
**EPS-14: 14th General Conference of the European Physical Society**
The 14th General Conference of the European Physical Society will take place on Wednesday, 27 August 2008 within the 22nd General Conference of its Condensed Matter Division.

The afternoon will be devoted to:

**Welcome by the EPS President**

**Award of the Condensed Matter Division Europhysics Prize to Andre Geim and Kostya Novoselov**

**Prize Lecture**

*Andre Geim and Kostya Novoselov*, Manchester Centre for Mesoscience & Nanotechnology, University of Manchester, U.K.

“Graphene: Magic of Carbon Flatland”

**Plenary Lecture**

*Helmut Dosch*, Max Planck Institut für Metallforschung, Stuttgart, Germany

“2011 —Odyssey in Nanospace”

**Coffee Break**

**Plenary Lecture**

*Klaus von Klitzing*, Nobel Laureate, MPI für Festkörperforschung, Stuttgart, Germany

“A brief interlude with Congratulatory Messages on the occasion of the 40th Anniversary of EPS”

**Conclusion by the European Physical Society, followed by**

**A Reception** on the Terrace of the Aula Magna (as of 18:35 hrs)

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**Instructions for Poster Presenters**

Each author is provided with one bulletin board measuring 90 cm wide x 120 cm high on which to display a summary of the paper. Fixing material (tape) will be provided. The boards will be grouped by sessions and marked with the paper session code.

Authors are requested to put up their poster on their allocated board already in the morning of the day of their presentation. Authors must remain in the vicinity of their poster for the entire duration of the session to answer questions. Posters still in their places on the next morning will be removed and discarded by the conference organization.

The schedule of the poster sessions is presented on the respective pages of this programme.

**Speakers’ Information**

The presentation times for oral sessions are as follows:

- Contributed talks → 15 minutes presentation and 5 minutes for discussion
- Invited talks → 30 minutes presentation and 10 minutes for discussion
- Plenary talks → 40 minutes presentation and 5 minutes for discussion

Speakers are asked to check-in with the session chairman in the conference room ten minutes before the session begins.

A speakers’ information desk will be operative during the conference for checking the presentations.

A PC with Windows XP, Power Point (for ppt format files) and Adobe Reader (for pdf format file) will be available in the conference room. Authors will transfer their oral presentation file by USB memory stick or CD-Rom.

**Location of the oral sessions according to the topics**

<table>
<thead>
<tr>
<th>Oral sessions</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnetism</td>
<td>Aula 3 (Physics Department - Fermi Building)</td>
</tr>
<tr>
<td>Semiconductor Physics</td>
<td>Aula Amaldi (Physics Dept - Marconi Building)</td>
</tr>
<tr>
<td>Surfaces, Interfaces, and Low-Dimensional Physics</td>
<td>Aula Magna (Rettorato)</td>
</tr>
<tr>
<td>Materials</td>
<td>Aula 1 (Physics Department - Fermi Building)</td>
</tr>
<tr>
<td>Methods for Cultural Heritage and Vacuum Science</td>
<td>Aula 1 (Physics Department - Fermi Building)</td>
</tr>
<tr>
<td>Superconductivity and Highly-Correlated Systems</td>
<td>Aula 4 (Physics Department - Fermi Building)</td>
</tr>
<tr>
<td>Liquids, Disordered and Off-Equilibrium Systems</td>
<td>Aula 6 (Physics Department - Fermi Building)</td>
</tr>
<tr>
<td>Polymer Physics</td>
<td>Aula Conversi (Physics Dept- Marconi Building)</td>
</tr>
<tr>
<td>Biological Physics and Life Sciences</td>
<td>Aula Conversi (Physics Dept- Marconi Building)</td>
</tr>
<tr>
<td>Physics of Socio-Economic and Complex Systems</td>
<td>Aula 6 (Physics Department - Fermi Building)</td>
</tr>
<tr>
<td>EPS-14</td>
<td>Aula Magna (Rettorato)</td>
</tr>
</tbody>
</table>
Lunches
Three lunches are included (from Tuesday to Thursday). Vouchers will be distributed.

The university canteen is located outside the campus (5 minutes' walk) in Via del Castro Laurenziano 7b.

Conference Hours:
- Monday 25 August 2008 14:00 - 18:30
- Tuesday 26 August 2008 08:45 - 12:50 and 14:40 - 18:40
- Wednesday 27 August 2008 09:00 - 12:50 and 14:40 - 18:35
- Thursday 28 August 2008 08:45 - 12:50 and 14:40 - 18:40
- Friday 29 August 2008 08:40 - 13:15

Coffee Breaks:
- Monday 25 August 2008 16:30 - 16:50
- Tuesday 26 August 2008 11:00 - 11:30
- Wednesday 27 August 2008 11:00 - 11:30 and 16:20 - 17:00
- Thursday 28 August 2008 11:00 - 11:30
- Friday 29 August 2008 10:00 - 10:30

Short Refreshment Breaks:
- Tuesday 26 August 2008 16:20 - 16:30
- Thursday 28 August 2008 16:20 - 16:30

Receptions:
- Monday 25 August 2008 18:30  →  Rettorato - Aula Magna Terrace
- Wednesday 27 August 2008 18:35  →  Rettorato - Aula Magna Terrace

Excursion Programme
An excursion programme at extra cost is scheduled as follows:

Night entertainments at the Roman Houses - Tuesday 26 August 2008, 20:00 - 21:30
Cost: € 33,- including the ticket to visit the houses, an English speaking guide, an English speaking actor and an English speaking tour leader.
Transportation to the Houses needs to be arranged by the participant.
The visit will be held only with a minimum of 20 people.

Guided visit to Borghese Gallery and Museum - Friday 29 August 2008, 17:00 - 19:00
Cost: € 40,- including the ticket to visit the museum, an English speaking guide and an English speaking tour leader.
Transportation to the Gallery and Museum needs to be arranged by the participant.
The visit will be held only with a minimum of 25 people.

Guided visit to Villa Adriana and Villa D’Este, Tivoli - Saturday 30 August 2008, 09:00 - 18:00
Cost: € 85,- including the coach to Tivoli, the ticket to visit Villa Adriana and Villa d’Este, a light lunch, an English speaking guide and an English speaking tour leader.
The excursion programme is organised by the local partner:
Symposia s.r.l.
B.go San Lazzaro 17 - 00136 Roma
Tel:+39 0639725540 / Fax:+390639725541
info@grupposymposia.it
Conference Location
Sapienza Università di Roma
Piazzale Aldo Moro 2
00185 Roma
Italy
http://www.uniroma1.it/
Tel. / Fax. +39 0 6 49914277
Email: alba.perrotta@roma1.infn.it

The conference will take place in the main campus of the Sapienza Università di Roma located in a central area of Rome, within walking distance of the main railway station “Roma Termini”, surrounded by the lively San Lorenzo area.

All the lecture halls are concentrated in a very small area within the campus. The main lecture hall is the **Aula Magna of the Rettorato** which contains up to 900 persons. The other lecture halls are located in the two buildings (**Marconi and Fermi**) of the Physics Department.

The exhibitors are located in the Rettorato.

The registration desks will be at the Rettorato main floor (up the central stairs), near to the entrance of the main lecture hall (Aula Magna).

Conference Management
The Conference management is provided by the European Physical Society, 6 rue des Frères Lumière, BP 2136, F-68060 Mulhouse Cedex, France

**Rome, Italy**
Rome is a very attractive city with multiple attractions to visit. All prices given hereafter are indicative and are liable to change.

**Trastevere**
Separated from central Rome by the Tiber River, Trastevere is a picturesque medieval neighbourhood characterised by a Bohemian atmosphere. Its narrow cobbled streets are lined with overhanging flower boxes and washing lines, and home to numerous cafes, boutiques, pubs and restaurants. The area has long attracted artists, famous people and experts, and is a charming place to explore, having escaped the developments of central Rome.

Transport: Bus H from the main train station, or tram 8 from Piazza Argentina

**Capitol Hill**
Capitol Hill was the original capitol of the ancient city and continues to serve as the seat of the city's government. The main feature of the area is Michelangelo's Piazza del Campidoglio, a testimony to the superiority of Renaissance town planning. The piazza is bordered by three palaces: the Palazzo dei Conservatori and the twin structures of the Palazzo dei Senatori and Palazzo Nuovo which house the Musei Capitolini, containing the largest collection of classical statues in the world. Among the notable statues found here are the Dying Gaul and the Satyr, the Capitoline Wolf with Romulus and Remus and the Spinario. Paths cut along the side of the hill from the Campidoglio giving way to panoramic views of the ancient sites of the Forum and Colosseum.

Address: Piazza del Campidoglio, Rome 1-00186
Website: www.museicapitolini.org/en/index_msie.htm
Telephone: Tel: 06 820 59127
Opening time: Museums open Tuesday to Sunday 9am to 7.30pm
Admission: €6.50, concessions available, Free to EU citizens under 18 and over 65.

**Roman Forum (Foro Romano)**
The site of ancient Rome's commercial, political and religious centre is in the valley between the Capitoline and Palatine hills. The Forum's main thoroughfare, Via Sacra, slices through the old market square and former civic centre. To make sense of the ruins and relics of the old Republic it is helpful to consult a map of the area. Some of the best preserved and most notable monuments include the impressive Arch of Septimus Severus - a construction designed to celebrate Roman victory over the Parthinnians - and the former atrium of the House of the Vestal Virgins and Temple of Vesta. Also of note are the Temple of Antoninus and Faustina, and the Arch of Titus, built to celebrate Titus' destruction of Jerusalem in AD 70. To the right of the arch are stairs snaking up the Palatine hill through a series of terraces to the Farnese gardens. The scented avenue festooned with roses and orange trees gives way to a vista over the Forum.

Address: Via dei Fori Imperiali, Opening time: Daily 9am to 7.30pm, Admission: Free
The Colosseum
This enduring symbol of ancient Rome tenaciously clings to its foundations as the site of former gladiatorial conquests. Its architecture boasts an impressive array of Doric, Ionic and Corinthian columns and an underground network of cells, corridors, ramps and elevators that were used to transport animals from their cages to the arena. The magnificence of the original structure has been eroded through the years of pillaging and earthquakes so that only a skeletal framework remains.
Address: Piazza del Colosseo
Transport: B line metro to Colosseo station; bus 60, 75, 85, 87, 175, 810 or 850; electric minibus 117; tram 3 or 8
Opening time: 8.30am to 7.30pm, Admission: €9

Pantheon
The stately Pantheon is one of the world's most inspiring architectural designs. Fittingly built as a temple to the Gods by Hadrian in 120AD, its perfectly proportioned floating dome rests seductively on sturdy marble columns. The only light source flowing through the central oculus was used by the Romans to measure time (with the aid of a sundial) and the dates of equinoxes and solstices. The south transept houses the Carafa Chapel and the tomb of Fra Angelico rests under the left side of the altar.
Address: Piazza della Rotonda
Opening time: Monday to Saturday between 8.30am and 7.30pm and Sunday from 9am to 6pm, Admission: Free

The Spanish Steps and Piazza di Spagna
The graceful steps built in 1725, elegantly curve their way from the Piazza di Spagna to the Church of Santa Trinit dei Monti, a pastel tinted neoclassical building. The shopper's paradise of Via Condotti leads back from the Spanish steps to Via del Corso, and during spring the steps are decorated with pink azaleas. At the foot of the steps lies Bernini's boat-shaped Barcaccia fountain and to the right is the unassuming Keats-Shelley Memorial House.
Transport: Take Metro Linea A to the Spagna stop; bus 60 and 492 to Piazza Barberini or 117 to Piazza di Spagna.

Trevi Fountain (Fontana di Trevi)
The tiny Piazza di Trevi has been immortalised through this fountain built for Pope Clement XII. The statues adorning this watery display represent Abundance, Agrippa, Salubrity, the Virgin and Neptune guided by two tritons. Tossing a coin into the fountain is supposed to guarantee a return trip to Rome.
Transport: Take the bus to Piazza San Silvestro

St Peter's Basilica (Basilica di San Pietro)
The Basilica lies above the reputed site of St. Peter's tomb. It is an overwhelming interior containing notable sculptures including Michelangelo's Pieta, which is protected by bullet-proof glass since the damaging attack on it in 1972. In the central aisle stands Arnolfo da Cambio's bronze statue of St Peter, its foot worn down by the constant flow of pilgrims' kisses. Proudly resting above the papal altar is Bernini's Throne of St Peter. The Vatican Grottoes, containing papal tombs, can be reached by steps from the statue of St Longinus, The Necropolis is located one level below the grottoes. This is the legendary site of St Peter's tomb and advance permission has to be obtained to view it. A strict dress code is in place for the Basilica and no shorts, bare shoulders or miniskirts are allowed (for men and women).
Address: Piazza San Pietro, Website: www.stpetersbasilica.org
Transport: Metro Ottaviano or bus to Piazza del Risorgimento, Opening time: Daily between 7am and 7pm, Dome: 8am to 6pm, Necropolis: Monday to Friday 9am to 5pm
Admission: Free. Dome: €4 (€5 with lift); Necropolis: €10

The Sistine Chapel & Vatican Museums
The Sistine Chapel's famous ceiling painted by Michelangelo looms above the frescoes on the side walls that were painted by an illustrious team of artists that included Botticelli, Ghirlandaio, Roselli, Pinturicchio, Signorelli and della Gatta. The altar wall is covered by Michelangelo's Last Supper, revealing the figure of Christ hovering above centre and flanked by Mary and other saintly figures. The Vatican Museums provide an inspiring visit to one of the world's greatest collections of art. The galleries stretch over four miles (6km) and include the magnificent Raphael rooms, the Etruscan Museum and the Pio-Clementino Museum, which boasts the world's largest collection of Classical statues.
Address: Viale Vaticano, Website: www.vatican.va
Transport: Metro to Musei Vaticani or Ottaviano station; tram 19 or bus 32, 81 or 98 to Piazza del Risorgimento
Opening time: Monday to Friday 8.45am to 1.45pm, Saturday 8.45am to 1.45pm (8 March to 29 October and 27 December to 6 January); daily 8.45am to 1.45pm, last entry at 12.20pm (7 January to 6 March and 2 November to 24 December) Closed Sundays except the last Sunday of every month.
Admission: €13. Free on the last Sunday of every month.

Basilica di San Giovanni
The Basilica of St John Lateran was built in the 4th century by Constantine the Great and was the first church built in Rome. It is the cathedral of the diocese of Rome, and as such ranks above all other Roman Catholic churches, even St Peter's Basilica in the Vatican. It is the official ecclesiastical seat of the Pope, and it is here that he celebrates Mass on certain religious holidays. The building has suffered much damage in the past and has been rebuilt several times, leaving only fragmented parts of the original church. The present building is characterised by its 18th-century façade and contains several important relics, an 13th-century cloister and an ancient baptistery. Inside are numerous statues, paintings, the High Altar that can only be used by the Pope, and a cedar table that is said to be the one used by Christ at the Last Supper. Across the street is one of the holiest sites in Christendom that is visited by pilgrims from around the world: the Palace of the Holy Steps, believed to be the 28 marble steps originally at Pontius Pilate's villa in Jerusalem that Christ climbed the day he was brought before Pilate. They have been in Rome since 1589.
Address: Piazza S. Giovanni in Laterano, Transport: San Giovanni metro
Opening time: Daily 7am to 6.45pm, Admission: Free; an admission of €2 is charged to enter the cloisters
**Useful links and addresses**


Youth hostel: [http://www.hihostels.com](http://www.hihostels.com)


Rome airport information: [http://www.adr.it/](http://www.adr.it/)


Ciampino Airport (CIA) information: [http://www.adr.it/content.asp?L=3&idmen=200](http://www.adr.it/content.asp?L=3&idmen=200)


Taxi Centro: Piazza Barberini, I-00187 Roma (RM), Phone +39 06 4814447

Taxi Centro: Vicolo Del Gallinaccio, I-00187 Roma (RM), Phone +39 06 6793733

Radio Taxi companies: +39 06 6645, +39 06 4994, +39 06 3570

Local accommodation partner:

**Symposia s.r.l.**

B.go San Lazzaro 17 - 00136 Roma

Tel:+39 0639725540 / Fax:+390639725541

info@grupposymposia.it

**Currency**

Euro is the official currency in Italy.

Major credit cards (VISA, Mastercard/Eurocard, American Express, Diners…) are generally accepted in airports, train stations, hotels, larger shops etc.

**Conference Language**

The official language of the conference is English.
Conference Chair: Lucia Sorba (Scuola Normale Superiore, Pisa and INFM-CNR, Italy)

Conference Co-chairs:
Carlo Mariani (Sapienza Università di Roma, and INFM-CNR, Italy)
and Eoin O’Reilly (Tyndall National Institute, Cork, Ireland)

Programme Committee Members:

Semiconductor Physics:
A. Fasolino (Radboud University Nijmegen, The Netherlands),
W. Wegscheider (University of Regensburg, Germany),
V. Pellegrini (NEST INFM-CNR & Scuola Normale Superiore, Italy)

Surfaces, Interfaces, and Low-Dimensional Physics:
M.G. Betti (Sapienza Università di Roma, Italy)
K. Wandelt (University of Bonn, Germany),
M. Sauvage (Synchrotron Soleil, France)
G. Held (University of Reading, United Kingdom)

Magnetism:
J. Vogel (Institut Néel, CNRS, France)
M.R. Ibarra (University of Zaragoza, Spain)
V. Sechovsky (Charles University, The Czech Republic)
C. Kapusta (Akademia Górniczo-Hutnicza, Poland)

Superconductivity and Highly-Correlated Systems:
C. Castellani (Sapienza Università di Roma, Italy)
M. Grioni (Ecole Polytechnique Fédérale, Switzerland)
P. Littlewood (Trinity College Cambridge, United Kingdom)

Liquids, Disordered and Off-Equilibrium Systems:
G. Ruocco (Sapienza Università di Roma, Italy),
S. Elliott (Trinity College Cambridge, United Kingdom)
L. Börjesson, (Chalmers University of Technology, Sweden)
H. Wennerstrom (University of Lund, Sweden)
G. Parisi (Sapienza Università di Roma, Italy),
L. Cugliandolo (Ecole Normale Supérieure, France)

Polymer Physics:
G. Reiter (Physikalisches Institut der Universität Freiburg, Germany)
W. Paul (University of Mainz, Germany)

Biological Physics and Life Sciences:
M. Bolognesi (University of Milano, Italy)
P. Facci (S3 INFM-CNR, Modena, Italy)
P. Lindgard (Risø National Laboratory, Denmark)
C. Veigel (National Institute for Medical Research, United Kingdom)

Materials
T. Janssen (Radboud University Nijmegen, The Netherlands),

Methods for Cultural Heritage and Vacuum Science
M. Anderle (Fondazione Bruno Klesser, Italy)
L. Kover (University of Debrecen, Hungary)

Physics of Socio-Economic Systems:
J.P. Bouchaud (CEA Saclay, France)
M. Marsili (ICTP, Trieste, Italy)
S. Bornholdt (University of Bremen, Germany)

Local Committee Members:
M.G. Betti
G. Bonizzoni
M. Capone
S. Caprara
M. Grilli
C. Mariani
A. Polimeni
F. Ricci Tersenghi
F. Sciarrino
T. Scopigno

Local Scientific Secretariat:
Alba Perrotta

Treasurer: D. Lee
Secretary: EPS

Industrial relations: L. Cinquetti
### Programme at a Glance

**Monday, August 25, 2008**

<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>14:00–14:15</td>
<td>Aula Magna</td>
<td>Opening</td>
</tr>
<tr>
<td>14:15–15:00</td>
<td>Aula Magna</td>
<td>MONPL: Plenary 1</td>
</tr>
<tr>
<td>15:10–16:30</td>
<td>Aula Magna</td>
<td>MON1M: Surface, Interface and Low-Dimensional Physics - Self Assembled Organic Layer</td>
</tr>
<tr>
<td>15:10–16:30</td>
<td>Aula Amaldi</td>
<td>MON1A: Semiconductor Physics - Quantum Hall</td>
</tr>
<tr>
<td>15:10–16:30</td>
<td>Aula Conversi</td>
<td>MON1C: Joint Biological Physics &amp; Life Sciences and Polymer Physics I</td>
</tr>
<tr>
<td>15:10–16:30</td>
<td>Aula 1</td>
<td>MON1F1: Materials - Carbon Nanotubes</td>
</tr>
<tr>
<td>15:10–16:30</td>
<td>Aula 3</td>
<td>MON1F3: Magnetism - Magnetic Nanoparticles</td>
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<tr>
<td>15:10–16:30</td>
<td>Aula 4</td>
<td>MON1F4: Superconductivity and Highly-Correlated Systems - High Tc Superconductivity I</td>
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<tr>
<td>15:10–16:30</td>
<td>Aula 6</td>
<td>MON1F6: Liquids, Disordered and Off-Equilibrium Systems - Spin Glasses</td>
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<tr>
<td>16:30–16:50</td>
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<td>Coffee Break</td>
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<tr>
<td>16:50–18:30</td>
<td>Aula Magna</td>
<td>MON2M: Surface, Interface and Low-Dimensional Physics - Organic Interfaces</td>
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<tr>
<td>16:50–18:30</td>
<td>Aula Conversi</td>
<td>MON2C: Joint Biological Physics &amp; Life Sciences and Polymer Physics II</td>
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<tr>
<td>16:50–18:30</td>
<td>Aula 1</td>
<td>MON2F1: Materials - Stability and Dynamics of Graphene (Shared with Semiconductors Physics)</td>
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<td>16:50–18:30</td>
<td>Aula 3</td>
<td>MON2F3: Magnetism - Magnetic Properties and Structures I</td>
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<tr>
<td>16:50–18:30</td>
<td>Aula 4</td>
<td>MON2F4: Superconductivity and Highly-Correlated Systems - High Tc Superconductivity II</td>
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<tr>
<td>16:50–18:30</td>
<td>Aula 6</td>
<td>MON2F6: Liquids, Disordered and Off-Equilibrium Systems - Out of Equilibrium Systems</td>
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<tr>
<td>18:30–20:00</td>
<td>Aula Magna Terrace</td>
<td>Drink</td>
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**Tuesday, August 26, 2008**

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<th>Time</th>
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<th>Event</th>
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<tr>
<td>8:45–9:30</td>
<td>Aula Magna</td>
<td>TUEPL: Plenary 2</td>
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<tr>
<td>9:40–11:00</td>
<td>Aula Magna</td>
<td>TUE1M: Surface, Interface and Low-Dimensional Physics - Electronic Properties I</td>
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<tr>
<td>9:40–11:00</td>
<td>Aula Amaldi</td>
<td>TUE1A: Semiconductor Physics - Electronic Properties I</td>
</tr>
<tr>
<td>9:40–11:00</td>
<td>Aula Conversi</td>
<td>TUE1C: Joint Biological Physics &amp; Life Sciences and Polymer Physics III</td>
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<tr>
<td>9:40–11:00</td>
<td>Aula 1</td>
<td>TUE1F1: Materials - Dynamics of Quasicrystals</td>
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<tr>
<td>9:40–11:00</td>
<td>Aula 3</td>
<td>TUE1F3: Magnetism - Magnetoelectronics I</td>
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<tr>
<td>9:40–11:00</td>
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<td>TUE1F4: Superconductivity and Highly-Correlated Systems - New Materials with Strong Correlations I</td>
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<td>9:40–11:00</td>
<td>Aula 6</td>
<td>TUE1F6: Liquids, Disordered and Off-Equilibrium Systems - High Frequency Dynamics in Disordered Systems</td>
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<td>Aula Magna</td>
<td>TUE2M: Surface, Interface and Low-Dimensional Physics - Electronic Properties II</td>
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<tr>
<td>11:30–12:50</td>
<td>Aula Amaldi</td>
<td>TUE2A: Semiconductor Physics - Quantum Transport</td>
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<td>11:30–12:50</td>
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<td>TUE2C: Joint Biological Physics &amp; Life Sciences and Polymer Physics IV</td>
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<td>11:30–12:50</td>
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<td>TUE2F1: Materials - Multiferroics</td>
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<td>TUE2F3: Magnetism - Magnetoelectronics I</td>
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<td>TUE2F4: Superconductivity and Highly-Correlated Systems - New Materials with Strong Correlations I</td>
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<td>12:50–14:40</td>
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<tr>
<td>14:40–16:20</td>
<td>Aula Magna</td>
<td>TUE3M: Surface, Interface and Low-Dimensional Physics - Organic Interfaces</td>
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<tr>
<td>14:40–16:20</td>
<td>Aula Amaldi</td>
<td>TUE3A: Semiconductor Physics - Graphene</td>
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<tr>
<td>14:40–16:20</td>
<td>Aula Conversi</td>
<td>TUE3C: Joint Biological Physics &amp; Life Sciences and Polymer Physics V</td>
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<td>14:40–16:20</td>
<td>Aula 1</td>
<td>TUE3F1: Methods for Cultural Heritage and Vacuum Science</td>
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<td>14:40–16:20</td>
<td>Aula 3</td>
<td>TUE3F3: Magnetism - Magnetic Characterization Using Synchrotron Radiation</td>
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<td>Aula 4</td>
<td>TUE3F4: Superconductivity and Highly-Correlated Systems - New Materials with Strong Correlations III</td>
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<td>Aula 6</td>
<td>TUE3F6: Liquids, Disordered and Off-Equilibrium Systems - Quantum Fluids</td>
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<td>16:20–16:30</td>
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<td>Short Refreshment Break</td>
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<td>16:30–18:40</td>
<td>Rettorato</td>
<td>TUEp.MAG: Magnetism - Poster Session</td>
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<tr>
<td>16:30–18:40</td>
<td>Physics Department</td>
<td>TUEp.CUL: Poster Session - Methods for Cultural Heritage and Vacuum Science</td>
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<td>TUEp.SEMI: Semiconductors Physics - Poster Session</td>
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<td>TUEp.MAT: Materials - Poster Session</td>
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<td>16:30–18:40</td>
<td>Physics Department</td>
<td>TUEp.SUR: Surface, Interface and Low-Dimensional Physics I - Poster Session</td>
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**Wednesday, August 27, 2008**

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<th>Time</th>
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<tr>
<td>9:00–11:00</td>
<td>Aula Magna</td>
<td>WED1M: Surface, Interface and Low-Dimensional Physics - Electronic Properties of Insulating and Magnetic Interfaces</td>
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<td>9:00–11:00</td>
<td>Aula Amaldi</td>
<td>WED1A: Semiconductor Physics - Quantum Effects in Low-Dimensional Systems</td>
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<tr>
<td>9:00–11:00</td>
<td>Aula Conversi</td>
<td>WED1C: Joint Biological Physics &amp; Life Sciences and Polymer Physics VI</td>
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<tr>
<td>9:00–11:00</td>
<td>Aula 1</td>
<td>WED1F1: Materials - Pairing Symmetry and Lattice Effects in Superconductors</td>
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<tr>
<td>9:00–11:00</td>
<td>Aula 3</td>
<td>WED1F3: Magnetism - Magnetoelectronics III</td>
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<td>9:00–11:00</td>
<td>Aula 4</td>
<td>WED1F4: Superconductivity and Highly-Correlated Systems - Quantum Spin Systems and Spectroscopy I</td>
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<td>9:00–11:00</td>
<td>Aula 6</td>
<td>WED1F6: Liquids, Disordered and Off-Equilibrium Systems - Supercooled Liquids and Glass Transition</td>
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<td>11:00–11:30</td>
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<td>11:30–12:50</td>
<td>Aula Magna</td>
<td>WED2M: Surface, Interface and Low-Dimensional Physics - Adsorption and Nanopatterning</td>
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<td>Aula Conversi</td>
<td>WED2C: Joint Biological Physics &amp; Life Sciences and Polymer Physics VII</td>
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<td>11:30–12:50</td>
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<td>WED2F1: Materials - Domains and Textures</td>
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<td>11:30–12:50</td>
<td>Aula 3</td>
<td>WED2F3: Magnetism - Magnetic thin Films</td>
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**Thursday, August 28, 2008**

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<tr>
<td>8:45–9:30</td>
<td>Aula Magna</td>
<td>THUPL: Plenary 3</td>
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<tr>
<td>9:40–11:00</td>
<td>Aula Magna</td>
<td>THU1M: Surface, Interface and Low-Dimensional Physics - Electronic Properties III</td>
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<td>9:40–11:00</td>
<td>Aula Amaldi</td>
<td>THU1A: Semiconductor Physics - Quantum Transport</td>
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<td>9:40–11:00</td>
<td>Aula Conversi</td>
<td>THU1C: Joint Biological Physics &amp; Life Sciences and Polymer Physics VII</td>
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<tr>
<td>9:40–11:00</td>
<td>Aula 1</td>
<td>THU1F1: Materials - Carbon Nanotubes</td>
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<td>9:40–11:00</td>
<td>Aula 3</td>
<td>THU1F3: Magnetism - Strongly Correlated Electron Systems</td>
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<td>9:40–11:00</td>
<td>Aula 4</td>
<td>THU1F4: Superconductivity and Highly-Correlated Systems - High Tc Superconductivity I</td>
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<tr>
<td>9:40–11:00</td>
<td>Aula 6</td>
<td>THU1F6: Physics of Socio-Economic and Complex Systems - Financial Markets</td>
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<td>11:00–11:30</td>
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<td>Coffee Break</td>
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<td>11:30–12:50</td>
<td>Aula Magna</td>
<td>THU2M: Surface, Interface and Low-Dimensional Physics - Small Particle and Nanowires</td>
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<td>11:30–12:50</td>
<td>Aula Amaldi</td>
<td>THU2A: Semiconductor Physics - Quantum Effects</td>
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<td>11:30–12:50</td>
<td>Aula Conversi</td>
<td>THU2C: Joint Biological Physics &amp; Life Sciences and Polymer Physics IX</td>
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<td>11:30–12:50</td>
<td>Aula 1</td>
<td>THU2F1: Surface, Interface and Low-Dimensional Physics - Graphene</td>
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<tr>
<td>11:30–12:50</td>
<td>Aula 3</td>
<td>THU2F3: Magnetism - Magnetic thin Films</td>
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11:30–12:50 Aula 3  THU2F3: Magnetism - Magnetic Nanoparticles and Nanowires
11:30–12:50 Aula 4  THU2F4: Superconductivity and Highly-Correlated Systems - High Tc superconductivity II
11:30–12:50 Aula 6  THU2F6: Physics of Socio-Economic and Complex Systems - Socio-Economic Networks
12:50–14:40  Lunch Break
14:40–16:20 Aula Magna  THU3M: Surface, Interface and Low-Dimensional Physics - Electronic Properties and Surface Structure
14:40–16:20 Aula Amaldi  THU3A: Semiconductor Physics - Quantum Optics
14:40–16:20 Aula Conversi  THU3C: Joint Biological Physics & Life Sciences and Polymer Physics X
14:40–16:20 Aula 1  THU3F1: Surface, Interface and Low-Dimensional Physics (Shared with Semiconductor Physics) - Surface: Nanostructures
14:40–16:20 Aula 3  THU3F3: Magnetism - Magnetic Properties and Structures II
14:40–16:20 Aula 4  THU3F4: Superconductivity and Highly-Correlated Systems - Theoretical Methods for Many Body Computation
14:40–16:20 Aula 6  THU3F6: Physics of Socio-Economic and Complex Systems - Ecosystems and Other Applications
16:20–16:30  Short Refreshment Break
16:30–18:40 Rettorato  THUp.SUP: Superconductivity and Highly-Correlated Systems - Poster Session
16:30–18:40 Physics Department  THUp.SOC: Physics of Socio-Economic and Complex Systems - Poster Session
16:30–18:40 Physics Department  THUp.SUR: Surface, Interface and Low-Dimensional Physics II - Poster Session
16:30–18:40 Physics Department  THUp.BIO: Biological Physics & Life Sciences - Poster Session
16:30–18:40 Physics Department  THUp.POL: Polymer Physics - Poster Session
16:30–18:40 Physics Department  THUp.LIQ: Liquids, Disordered and Off-Equilibrium Systems - Poster Session

Friday, August 29, 2008

8:40–10:00 Aula Magna  FRI1M: Surface, Interface and Low-Dimensional Physics - Electronic Properties and Surface Structure
8:40–10:00 Aula Amaldi  FRI1A: Semiconductor Physics - Quantum Optics
8:40–10:00 Aula Conversi  FRI1C: Joint Biological Physics & Life Sciences and Polymer Physics XI
8:40–10:00 Aula 1  FRI: Talks from Exhibitors
8:40–10:00 Aula 3  FRI1F3: Magnetism - Magneto Electronics Materials I
8:40–10:00 Aula 4  FRI1F4: Superconductivity and Highly-Correlated Systems - High Tc Superconductivity and Quantum Criticality I
8:40–10:00 Aula 6  FRI1F6: Physics of Socio-Economic and Complex Systems - Self-Organization in Socio-Economic Systems
10:00–10:30  Coffee Break
10:30–11:50 Aula Magna  FRI2M: Surface, Interface and Low-Dimensional Physics - Electronic Properties IV
10:30–11:50 Aula Amaldi  FRI2A: Semiconductor Physics - Low Dimensional Systems
10:30–11:50 Aula Conversi  FRI2C: Joint Physical Science & Life Sciences and Polymer Physics XII
10:30–11:50 Aula 1  FRI1F: Surface, Interface and Low-Dimensional Physics - Nanowires, Nanoparticles
10:30–11:50 Aula 3  FRI2F3: Magnetism - Magneto Electronics Materials II
10:30–11:50 Aula 4  FRI2F4: Superconductivity and Highly-Correlated Systems - High Tc Superconductivity and Quantum Criticality II
10:30–11:50 Aula 6  FRI2F6: Physics of Socio-Economic and Complex Systems - Dynamics of Socio-Economic Systems
12:00–12:45 Aula Magna  FRI1P: Plenary 4
12:45–13:15 Aula Magna  Prize + Closing
Plenary and Invited Talks at a Glance

Monday, August 25, 2008

14:15 Aula Magna MONPL.1: Rafał Dunin-Borkowski, M. Pósfai, T. Kasama — Magnetic Microstructure of Closely-Spaced Ferrimagnetic Crystals in Magnetotropic Bacteria
15:10 Aula Magna MON1M.1: Aron Pinczuk — Quantum Hall Fluids: New Insights from Optics
15:10 Aula Amaldi MON1A.1: Aron Pinczuk — Quantum Hall Fluids: New Insights from Optics
16:50 Aula 1 MON1F1.1: Thomas Pichler — Unraveling the electronic structure of functionalized single wall carbon nanotubes
15:10 Aula 3 MON1F3.1: Gerardo Goya — Magnetic Hyperthermia for Biomedical Applications
15:10 Aula 4 MON1F4.1: Ming Shi, Joel Mesot — Electronic and Magnetic Excitations of High-Temperature Cuprate Superconductors Probed by ARPES and Neutron Scattering
15:10 Aula 6 MON1F6.1: Silvio Franz — Interfaces in Hierarchical and Finite Dimensional Spin Glasses.
16:50 Aula Conventi MON1C.1: Anna Niedzwiecka — Molecular Recognition of the mRNA 5'- and 3'-end Structures by Proteins
16:50 Aula 1 MON2F1.1: Mikhail Katsnelson — Graphene: A new bridge between condensed matter physics and quantum electrodynamics
16:50 Aula 6 MON2F6.1: Jorge Kurchan, Romain Maris, Florent Kizalak — Jamming versus Glass Transitions

Tuesday, August 26, 2008

8:45 Aula Magna TUE1M.1: Daniel Malterre, Yannick Fagot-Revurat, Bertrand Kien, Clément Didiot — Surface state in self-organized nanostructured surfaces
9:40 Aula Magna TUE1F1.1: Marek Mihalkovic, Marc Welland, Christopher Dobson — Physical aspects in protein aggregation
9:40 Aula Conventi TUE1F1.1: Marek Mihalkovic, Marc Welland, Christopher Dobson — Physical aspects in protein aggregation
9:40 Aula 3 TUE1F3.1: Paulo Freitas — Magnetic tunnel junctions
9:40 Aula 4 TUE1F4.1: Erko Tosatti, Massimo Capone, Michele Fabrizio, Claudio Castellani — Strongly correlated superconductivity and Mott transition of expanded A3C60 alkali fullerenes

9:40 Aula 6 TUE1F6.1: Francesco Sette — Science and Challenges at the European Synchrotron Radiation Facility
11:30 Aula Conventi TUE2C.1: Roland G. Winkler — Mesoscale simulations of polymers in external fields
11:30 Aula 1 TUE2F1.1: James F. Scott — New Results on Magnetoelectric Multiferroics
11:30 Aula 3 TUE2F3.1: Mathias Kläui — Current-induced Domain Wall Dynamics
14:40 Aula Magna TUE3M.1: Stefano Fabris — Understanding the Structure and Function of Self-Assembled Organometallic Nanomaterials by Computer Modeling
14:40 Aula Conventi TUE3C.1: Simon Scheuring — Structure and assembly of membrane proteins in native membranes by atomic force microscopy (AFM)
14:40 Aula 1 TUE3F1.1: Mark Dowsett, Annemie Adriaens — The use of Infrastructural Facilities for Cultural Heritage Research
14:40 Aula 3 TUE3F3.1: Tolek Tyliszczak, Yves Acremann, Bartel Van Waeyenberge, Hermann Stoll — Characterization of magnetization dynamics by scanning transmission x-ray microscope
14:40 Aula 6 TUE3F6.1: Riccardo Zecchina — Statistical Mechanics of Stoney Trees
15:20 Aula 1 TUE3F1.2: Gerd Ulrich Nienhaus — Nanoscience for the Conservation of Cultural Heritage

Wednesday, August 27, 2008

9:00 Aula Magna WED1M.1: Jose Ignacio Pascual, Isabel Fernandez-Torrente, Katharina Franke — Scanning tunneling spectroscopy of molecular donor-acceptor assemblies
9:00 Aula Amaldi WED1A.1: Massimo Rontani — An Electron Molecule in a Quantum Dot: Theory and Inelastic Light Scattering Experiments
9:00 Aula Conventi WED1C.1: Ludwik Leibler — Supramolecular plastics and self-healing rubbers
9:00 Aula 1 WED1F1.1: K. Alex Müller — Early signatures of s and d symmetries in high temperature superconducting copper oxides
9:00 Aula 3 WED1F3.1: Andreas Wieck — Ferromagnetic GaN by rare earth implantation
9:00 Aula 4 WED1F4.1: Henrik Ronnow — Neutron Experiments in Quantum Spin Systems
9:00 Aula 6 WED1F6.1: Jeppe C. Dyre, Ulf R. Pedersen, Nicholas Bailey, Thomas B. Schröder — “Strong pressure-energy correlations in the thermal equilibrium fluctuations of model liquids: Cause and consequences”
9:40 Aula Conventi WED1C.2: Gerd Ulrich Nienhaus, Karin Nienhaus — Protein-Ligand Interactions in Heme Proteins
11:30 Aula Amaldi WED2A.1: Carlo Sirtori, Sukhdeep Dhillon, Stefano Barbieri — THz transfer on an optical carrier
22nd General Conference of the Condensed Matter Division of the European Physical Society · Plenary and Invited Talks at a Glance

Friday, August 29, 2008

8:40 Aula Magna FRI1M.1: Werner A. Hofer — Dynamic Processes Observed by Scanning Tunnelling Microscopes: Conformation Changes, Diffusion and Vibrations

8:40 Aula Amaldi FRI1A.1: Andrew Shields — Nano-photonic devices for quantum information technology

8:40 Aula Conversi FRI1C.1: Gert Strobl — Laws Controlling Crystallization and Melting in Bulk Polymers

8:40 Aula 4 FRI1F4.1: Giacomo Ghiringhelli — Magnetic excitations measured by high resolution $L_3$ edge RIXS in cuprates and in NiO

8:40 Aula 6 FRI1F6.1: Janos Kertesz, Et Al. — Social networks and their modeling

15:00 Aula 6 FRI3F6.1: Andrea Baronchelli — Statistical physics approach to language dynamics

12:00 Aula Magna FRIPL.1: Annabella Selloni — Organic molecules on surfaces: insights from first principles simulations

Thursday, August 28, 2008

8:40 Aula Magna THU1M.1: Werner A. Hofer — Dynamic Processes Observed by Scanning Tunnelling Microscopes: Conformation Changes, Diffusion and Vibrations

8:40 Aula Amaldi THU1A.1: Antoine Georges — Condensed matter physics with light and atoms: ultra-cold fermions in optical lattices.

8:40 Aula Conversi THU1C.1: Thomas Russell — Directed Self-Oriented Self-Assembly of Block Copolymers: Bottom-Up Meeting Top-Down

8:40 Aula 6 THU1F6.1: Stefano Ciliberti — The stock option market as a tool to measure investor’s risk

11:30 Aula Conversi THU2C.1: Dimitris Vlassopoulos, Michael Kapnistos, Michael Lang, Wim Pychhout-Hintzen, Dieter Richter, Donghyun Cho, Taihyun Chang, Jacques Roovers, Michael Rubinstein — Dynamics of cyclic polymers

14:40 Aula Magna THU3M.1: Elias Vlieg, Wim Noorduin, Hugo Meekes, Willem van Enkevort, Toshiko Izumi, Donna Blackmond, Alessia Millemaggi, Bernard Kaptein, Michel Leeman, Richard Kellogg — Chiral purification using Ostwald ripening

14:40 Aula Conversi THU3C.1: Juan Colmenero — Dynamics of Asymmetric Polymer Blends

11:30 Aula 6 THU2F6.1: Joerg Reichardt — Block-Structure and Function in Networks

Magnetic Microstructure of Closely-Spaced Ferrimagnetic Crystals in Magnetotactic Bacteria — Rafal Dunin-Borkowski, M. Pósfaí, and T. Kasama

Chair: Lucia Sorba, Scuola Normale Superiore, Pisa, Italy

Off-axis electron holography in the transmission electron microscope is used to image the magnetic remanent states and magnetization reversal mechanisms, and to measure the magnetic moments, of arrangements of ferrimagnetic nanocrystals synthesized by magnetotactic bacteria.

Quantum Hall Fluids: New Insights from Optics — Aron Pinczuk

Chair: J.C. Maan, University of Nijmegen, Nijmegen, The Netherlands

Quantum Hall liquids support low-energy excitation modes that manifest emergent physics due to fundamental interactions. Inelastic light scattering experiments at very low temperatures access these modes to explore novel physics in reduced dimensionality.

Slow Dynamics and Glass Transition in Simulated Polymer Films — Simone Peter, Hendrik Meyer, and Jörg Baschnagel

Chair: G. Struck, Freiburg Universität, Freiburg, Germany

By computer simulations we explore the depression of the glass transition temperature for freely standing and supported polymer films. This depression results from a smooth gradient of enhanced dynamics, induced by the interfaces.

Unraveling the electronic structure of functionalized single wall carbon nanotubes — Thomas Pichler

Chair: H. Kuzmany, University of Wien, Wien, Austria

Examples of the electronic properties of functionalized SWCNT using high energy spectroscopy as a probe will be presented, emphasizing the influence of basic correlation effects, local field corrections on their (metallic) ground state.
15:10 – 16:30
MON1F3: Magnetism - Magnetic Nanoparticles
Chair: T. Tyliszczak, Ernest Orlando Lawrence Berkeley National Laboratory, USA

MON1F3.1 (Invited) 15:10
Magnetic Hyperthermia for Biomedical Applications
— •Gerardo Goya1, Ivan Marcos-Campos2, Laura Asín2, Teóraldo Torres1, Fanny de la Iglesia1, Valeria Graziu1, María Moros1, Nicolás Cassinelli1, Javier Godeno2, Ariel Silber1, Alejandro Tres2, and M. Ricardo Ibarra3 —
1Nanoscience Institute of Aragon (INA), University of Zaragoza, Pedro Cerbuna 12, 50009-Zaragoza, Spain. — 2Hospital Clínico Universitario ‘Lozano Blesa’, San Juan Bosco 15, Zaragoza, Spain. — 3Instituto de Ciências Biomédicas, Universidade de São Paulo. São Paulo, Brazil.

Magnetic hyperthermia (MHT) experiments were done to evaluate possible therapies on unicellular organisms. We studied the final location of the particles; the toxicity effects, and the effectiveness of MHT to induce cell death.

15:10 – 16:30
MON1F4: Superconductivity and Highly-Correlated Systems - High Tc Superconductivity I
Chair: E. Tosatti, SISSA, Trieste, Italy

MON1F4.1 (Invited) 15:10
Electronic and Magnetic Excitations of High-Temperature Cuprate Superconductors Probed by ARPES and Neutron Scattering
— •Ming Shi2 and Joel Mesot1 —
1Paul Scherrer Institute, Villigen, Switzerland — 2Swiss Light Source, Paul Scherrer Institute, Switzerland

Recent results obtained on LSCO will be presented. Issues such as the shape of the superconducting order parameter and its doping dependence, coherent vs incoherent excitations and anisotropic scattering will be discussed.

15:10 – 16:30
MON1F6: Liquids, Disordered and Off-Equilibrium Systems - Spin Glasses
Chair: R. Zecchina, Politecnico di Torino, Turin, Italy

MON1F6.1 (Invited) 15:10
Interfaces in Hierarchical and Finite Dimensional Spin Glasses.
— •Silvio Franz —
LPTMS Université Paris-Sud 11, Paris, France

I will describe a new method to study the stability of the spin glass phase against fluctuation of the order parameter. I will present analytical and numerical results for hierarchical spin glasses and the three dimensional model.
Monday

MON1M.2 16:10
Highly Organized Semifluorinated Alkane Monolayer — • PHILIPPE FONTAINE2, Lisa BARDIN1, 2, MARIE-CLAUDE FAURE2, Michel GOLDMANN2, MARIE-PIERRE KRAFFT3, and Eduardo Filipe3 — 1Synchrotron SOLEIL, Saint Aubin, France — 2Institut des NanoSciences de Paris, Paris, France — 3Institut Charles Sadron, Strasbourg, France — 4Instituto Superior Tecnico, Lisbon, Portugal
Using Grazing Incidence Small Angle X-ray Scattering, we demonstrate that Langmuir monolayers on the water surface of Semifluorinated alkanes (CnF2n+1CmH2m+1) exhibits an hexagonal network of nano-domains with a large parameter (30nm).

MON1A.2 16:10
Quantum Hall effect in random GaAs/AlGaAs superlattices — • YURY PUSEP1, Alberto RODRIGUEZ2,3, Aroldo ARAKANI1, and Carlos de SOUZA1 — 1Instituto de Fisica de Sao Carlos, Universidade de Sao Paulo, 13460-970 Sao Carlos, SP, Brazil — 2Centre for Scientific Computing, University of Warwick, Coventry, CV4, 7AL, UK — 3Departamento de Fisica Fundamental, Universidad de Salamanca, 37008, Salamanca, Spain.
Stability of the quantized Hall phases is studied in weakly coupled GaAs/AlGaAs multilayers as a function of the interlayer correlations controlled by the interlayer tunneling and by the random variation of the well thicknesses.

MON1C.3 16:10
Small-molecule diffusion in semicrystalline polymers — • Ulf GEDDE, Mikael Hedenqvist, Alessandro Mattozzi, and Bereket NEWMAY — Fibre and Polymer Technology, School of Chemical Science and Engineering, Royal Institute of Technology, SE-100 44 Stockholm, Sweden
Diffusion of n-hexane in poly(ethylene-co-1-hexene)s with different comonomer contents and crystallinities has been studied by desorption experiments, X-ray scattering, NMR and Raman spectroscopy, molecular dynamics simulation, and random-walk simulations based on computer-built spherical structures.

MON1F1.2 16:10
In-situ Raman spectroelectrochemistry: a method of choice to study carbon nanotubes — • Martin KALBAc1,2, Ladislav KAVAN1, and Lothar DUNSCHE2 — 1J. Heyrovsky Institute of Physical Chemistry, Academy of Sciences of the Czech Republic, Dobojkova 3, CZ-182 23 Prague 8, Czech Republic — 2Leibniz Institute of Solid State and Materials Research, Helmholtzstr. 20, D - 0109 Dresden, Germany
A detail analysis of the behavior of SWCNTs during electrochemical doping is presented. Special attention has been paid to the development of the Raman tangential mode.

MON1F1.3 16:10
An equimolar C2H2-CO2 reaction in the synthesis of Carbon Nanotubes — • Arnaud MAGREZ, Jin Won SEO1,2, Barbara KORBELY1,3, Marianna MIONIC1, and Laszlo FORRER4 — 1IPMC, EPF Lausanne, Switzerland — 2IPMC, EPP Lausanne, Switzerland — 3Leibniz Institute for Solid State and Materials Research, Dresden, Germany — 4Institute of Solid State and Materials Research, Helmholtzstr. 20, D - 0109 Dresden, Germany
We will show that mixing C2H2 and CO2 in an equimolar proportion (C2H2/CO2=1) provides outstanding kinetics of the carbon nanotubes synthesis reaction below 500 °C on numerous functional materials without any demanding catalyst pre-activation step.
Aula 4

16:30 – 16:50: Coffee Break

MON1F3.3 16:10
Magnetic microstructure of magnetite doped elastomers investigated by SANS and SAXS — •Maria Balasoiu1,2, Mihail-Liviu Craus1,3, Vasil Hramus4, Josef Plešttl5, Alexander Küblin1, Raul Erhan1, Eugen Mircea Antas1, Andreas Schreyer1, Mihai Lozovan3, Vasile Tripadus2, and Ioan Bica6 — 1Joint Institute of Nuclear Research, Dubna, Russia — 2National Institute of Physics and Nuclear Engineering, Bucharest, Romania — 3National Institute of Research and Development for Technical Physics, Iasi, Romania — 4GKSS Forschungszentrum, Geesthacht, Germany — 5Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Prague — 6The West University of Timisoara, Department of Electricity and Magnetism, Timisoara, Romania
Stomaflex elastomer filled with nanoscale magnetite particles have been investigated by Small Angle Neutron Scattering (SANS) and Small Angle X-ray Scattering (SAXS). Average size of the particles and the strain was determined by XRD.

16:30 – 16:50: Coffee Break

MON1F3.2 15:50
Spin-glass like freezing and enhanced magnetization in ultra-small CoFe2O4 nanoparticles — •David Peddis and Dino Fiorani — Istituto di Struttura della Materia - CNR. C.P. 10, 00161 Monterotondo Stazione (Roma), Italy
The results presented in this communication provide evidence of a magnetic transition to a frozen spin-glass like state at low temperature (below 30 K) accompanied by enhanced saturation magnetization and increase of magnetic anisotropy.

Aula 6

MON1F6.2 15:50
Aging dynamics of Ising Spin Glasses in three dimensions — •Francesco Belletti1, Maria Cotallo2,3, Andres Cruz2,3, Luis Antonio Fernandez3,5, Antonio Gordillo6, Marco Guidetti1, Andrea Maiorano2,3, Filippo Mantovani1, Enzo Marinari4, Victor Martin-Mayor3,5, Antonio Muñoz-Sudupe5, Denis Navarro6, Giorgio Parisi2, Sergio Pérez-Gaviro2,3, Juan Jesús Ruiz-Lorenzo7, Sebastiano Fabio Schipano1, Daniele Schirotto2,3, Alfonso Tarancón2,3, Raffaele Trippiccione1, Jose Luis Velasco2,3, and David Yllanes5 — 1 Dipartimento di Fisica, Università di Ferrara, 44100 Ferrara (Italy) — 2 Dipartamento di Fisica Teorica, Università di Zaragoza, 50009 Zaragoza (Spain) — 3 Instituto de Biocomputación y Física de Sistemas Complejos (BIFI), 50009 Zaragoza (Spain) — 4 Dipartimento di Fisica, Università di Roma “La Sapienza”, 00185 Roma (Italy) — 5 Departamento de Física Teórica, Universidad de Zaragoza, 50009 Zaragoza (Spain) — 6 Instituto de Investigación en Ingeniería de Aragón (I3A), Universidad de Zaragoza, 50018 Zaragoza (Spain) — 7 Departamento de Física, Universidad de Extremadura, 06071 Badajoz (Spain)
The aging behavior of the three-dimensional ±J Edwards-Anderson model is investigated numerically. The time scales of our simulation on the Janus supercomputer correspond to order 10−19 s of an experiment on a real sample.

MON1F6.3 16:10
Diluted 1-d spin glasses with power law decaying interactions — •Luca Leuzzi1, Giorgio Parisi1,2, Federico Ricci-Tersenghi2, and Juan-José Ruiz-Lorenzo3 — 1SMC-INFM-CNR, Rome, Italy — 2Dipartimento di Fisica, Università “Sapienza”, Rome, Italy — 3 Dipartamento di Fisica, Univ. Extremadura, Badajoz, Spain
We study a diluted 1-d spin glass model with algebraic decaying interactions finding static and dynamic evidence for the replica symmetry breaking theory out of the mean-field approximation. The effect of applying a magnetic field is presented.
22nd General Conference of the Condensed Matter Division of the European Physical Society - Monday 25 August 2008

Monday 25 August 2008

Aula Magna

16:50 – 18:30
MON2M: Surface, Interface and Low-Dimensional Physics - Organic Interfaces
Chair: P. Fontaine, Synchrotron SOLEIL, Saint Aubin, France

MON2M.1 16:50
Long-range order and interaction of the Pentacene/Cu(111) interface studied by Scanning Tunneling Microscopy (STM) and X-ray spectroscopy
— Mirco Chiodo1,2, Alvaro Cossaro2, Luca Floreano2, Alberto Morgante2, and Luca Gavogli1,2 —
1 Dipartimento di Matematica e Fisica, Università Cattolica del Sacro Cuore, via dei Musei 41, IT-25121 Brescia, Italy — 2 Laboratorio Nazionale TASC-CNR-INFM, Basovizza SS-14, Km 163-5, IT-34012 Trieste, Italy

Core-level and STM data on pentacene/Cu(111) surface show that substrate-induced long-range order substantially decreases above the first layer, as the molecule-metal interaction weakens. Changes of core-level lineshape and morphology for the annealed multilayer are discussed.

MON2M.2 17:10
First principles study of aromatic molecules on Copper substrates
— Andrea Ferretti1, Arigco Calzolari2, Rosa Di Felice2, Alicia Ruiz1,2, and Elisa Molinari1,2 —
1 Dipartimento di Fisica, Università di Modena e Reggio E., via Campi 213/A, IT-41100 Modena, Italy — 2 INFN-CNR-S3, Natl. Center on Nanostructures and bioSystems at Surfaces, via Campi 213/A, IT-41100 Modena, Italy

By combining experimental and theoretical approaches, we study the adsorption of pentacene on copper to investigate the coupling between aromatic molecules and metal surfaces. Our results demonstrate electronic mixing between molecular orbitals and metal states.

MON2M.3 17:30
Impurities in Self-Assembled Free-Standing Semiconductor Nanowires
— Bart Peters1, Bin Li1, Hartwin Pfeil2, Slachmuylers1, Wim Magnus1, and Francois Peeters1 —
1 Department of Physics, University of Antwerp, Belgium

We performed ab initio and effective mass calculations to study the localization of dopants and the shallow impurity states in free-standing semiconductor nanowires. Also the phonons are studied to determine the stability of these wires.

Aula Amaldi

16:50 – 18:30
MON2A: Semiconductor Physics - Invited Focus Symposium: Optical and Electronic Properties of Self-Assembled Quantum Dots, Rings and Wires
Chair: J. T. Devreese, Universiteit Antwerpen, Belgium

MON2A.1 16:50
Controlled Variation of Excitonic Fine Structure Splitting in Single Quantum Dots for Future Single Qbit and Entangled Photon Emitters
— Dieter Bimberg1,2, Institute für Festkörperforschung, Technische Universität Berlin, Hardenbergstraße 36, 10623 Berlin, Germany —

The excitonic fine-structure splitting in single InAs/GaAs quantum dots (QDs) is investigated both experimentally and theoretically. It can be tuned by QD size and ex-situ annealing. An electrically driven single-photon emitter is demonstrated.

MON2A.2 17:10
Optical and Electronic Properties of Self-Assembled Nanowires
— Lars Samuelson1, Lund University, Solid State Physics, Box 118, SE-221 00 Lund, Sweden —

Nanowires are formed via a self-assembling method, by which ideal 10nm-scale devices may be formed. In this talk is summarized the status of growth, optical and electronic properties and applications of III-V nanowires.

MON2A.3 17:30
Crystal structures and kinetic characterization of protoglobins: novel ligand-diffusion pathways to the heme
— Marco Nardini1, Alessandra Pesci2, Liesbet Thoors3, Jennifer A. Saito4, Sylvia Dewilde5, Maq- sudul Alam6, Paolo Ascenzi7, Massimiliano Coletta1, Chiara Caccio6, Luc Moens8, and Martino Bolognesi9 —
1 Department of Biomolecular Sciences and Biotechnology, CNR-INFM, University of Milano, Via Celoria 26, 20133-Milano, Italy — 2 Department of Physics, CNR-INFM and CEBR, University of Genova, Via Dodecaneso, 33, 16146-Genova, Italy — 3 Department of Biomedical Sciences, University of Antwerp, Universiteitsplein 1, B-2610 Antwerp, Belgium

We present a novel theoretical realization of an integer quantum Hall effect in a massless Dirac-electron system with a chiral boundary in a zero magnetic field. In particular, our findings apply to zigzag-terminated graphene.

Aula Conversi

16:50 – 18:30
MON2C: Joint Biological Physics & Life Sciences and Polymer Physics II
Chair: C. Cecconi, S3 INFM-CNR, Modena, Italy

MON2C.1 (Invited) 16:50
Molecular Recognition of the mRNA 5'-end by Specific and Poly(A)-Specific Exoribonuclease
— Alice Ruini1,2, Albano Cossaro2, Elisa Molinari1,2, and Luca Gavogli1,2 —
1 Dipartimento di Fisica and CNR-INFM, Università di Milano, Via Celoria 26, 20133 Milano, Italy — 2 Laboratorio Nazionale TASC—CNR-INFM, Basovizza SS-14, Km 163-5, IT-34012 Trieste, Italy

We demonstrated that a specific and poly(A)-specific exoribonuclease have been analyzed by biophysical methods.

MON2C.2 17:30
Surface quantum Hall state and spin accumulation in graphene in a zero magnetic field
— Grigory Tkachov and Martin Hentschel —

We present a novel theoretical realization of an integer quantum Hall effect in a massless Dirac-electron system with a chiral boundary in a zero magnetic field. In particular, our findings apply to zigzag-terminated graphene.

Aula 1

16:50 – 18:30
MON2F: Materials - Stability and Dynamics of Graphene (Shared with Semiconductors Physics)
Chair: A. Fasolino, Institute of Theoretical Physics Toernooiveld, Nijmegen, The Netherlands

MON2F1.1 (Invited) 16:50
Graphene: A new bridge between condensed matter physics and quantum electrodynamics
— Mikhail Katsnelson —

A review of "quantum relativistic" dynamics of charge carriers in single- and bilayer graphene is done, with a special emphasize of the effects of corrugations of graphene sheets.
Magnetism of coupled Fe chains deposited on Ir(100) surfaces — Riccardo Mazzarello, Andrea Dal Corso, and Erio Tosatti

Optical conductivity, Raman response and the correlation strength of high temperature copper-oxide superconductors — Luca de’ Medici, Armin Comanac, Massimo Capone, and Andrew J. Mellis

Superconducting pairing through the spin resonance mode in the high-Tc cuprates — Flora Onufrieva and Pierre Pfeuty

Intermittent response and spontaneous nucleation in off-equilibrium aging dynamics — Paolo Shibani

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MON2M.4 17:50

Functionalisation of Au and Si (111) surfaces by benzoic acid — 1Xin Zhang, Hahn-Meitner-Institut Berlin, Abteilung Silizium-Photovoltaik, Kekuléstr. 5, 12459 Berlin, Germany and 2Festkörperforschung, Forschungszentrum, Jülich, Germany — 3Department of Experimental Medicine and Biological Sciences, University of Rome “Tor Vergata”, Via di Tor Vergata, 135, 00133 Roma, Italy

We present the electrochemical deposition on clean Au and Si(111):H surfaces in both aqueous and non-aqueous solutions. Ex-situ infrared spectroscopic ellipsometry was applied to inspect the surface species.

MON2A.4 17:50

Quantum dot polarons: energy levels, relaxation and decoherence — 1Gerald Bastard, LPA-ENS 24 rue Lhomond F75005 Paris (France)

We present calculations of the relaxation, spin flip lifetime, four wave mixing signal (FWMS) of the quantum dot polarons in InAs/GaAs QD’s.

MON2C.3 17:50

Advanced NMR diffusion techniques to study bone marrow properties in trabecular bone network — 1Silvia De Santis1,2, Silvia Capuani1,2, and Bruno Maraviglia1,3

We investigated bone marrow in trabecular bone network with DTI and AD NMR methods. We found molecular diffusion anisotropy and fractal dimension to be important tools to describe the behaviour of water interacting with lipids.

MON2F1.3 17:50

Non-linear terahertz optics of graphene — 1Sergey Mikhailov and Klaus Ziegler — Institute for Physics, University of Augsburg, Augsburg, Germany

Non-linear kinetic theory of the electromagnetic response of graphene is developed taking into account self-consistent field effects. Radiative decay is calculated. Conditions of efficient higher harmonics generation of terahertz radiation in graphene are determined.

MON2M.5 18:10

Efficient coupling in organic-inorganic systems: a theoretical study — 1Giuseppe Mattioli1,2, Francesco Filipponi3, Paolo Giannoni3, Paola Alippi3, and 2Aldo Amore Bonapasta1 — 1Istituto di Struttura della Matiera (ISM) CNR, Via Salaria Km. 29.5, CP 10, 00016 Monterotondo Stazione, Italy — 2Dipartimento di Chimica, Università di Roma La Sapienza, P.le A. Moro 2, 00185 Roma, Italy — 3Dipartimento di Scienze dell’Informazione e dell’Interazione con l’Ambiente, Università degli Studi di Roma “Tor Vergata”, Via Salaria Km. 29.5, 00100 Roma, Italy

The electron and exciton energy spectra, the magnetization and the optical-transition probabilities are explained for strained In1−xGa1+xAs/GaAs self-assembled quantum rings. A theoretical model is developed using realistic parameters inferred from the cross-sectional scanning-tunneling microscopy data.

MON2A.5 18:10

Electron and Exciton Energy Spectra and the Aharonov-Bohm Effect in Self-Assembled Ring-Like Nanostructures — 1Vladimir Fomin, 2FPVS, Universiteit Antwerpen, Belgium — 3PSN, COBRA, TU Eindhoven, The Netherlands — 4INFM-CNR SOPT, Physics Department, University of Rome “La Sapienza”, Via A. Moro 2, 00185 Roma, Italy

The electron and exciton energy spectra, the magnetization and the optical-transition probabilities are explained for strained In1−xGa1+xAs/GaAs self-assembled quantum rings. A theoretical model is developed using realistic parameters inferred from the cross-sectional scanning-tunneling microscopy data.

MON2C.4 18:10

Proteins in binary solvents: an analysis of solvation properties and interactions by neutron and X-ray scattering techniques — 1Francesco Spinozzi, 2Flavio Carchioli2, 3Maria Grazia Ortoleva3, 4Raffaella Sinibaldi1, 5Paolo Mariani1 — 1Istituto di Struttura della Matiera (ISM) CNR, Bari, Italy — 2Dipartimento di Scienze dell’Informazione e dell’Interazione con l’Ambiente, Università degli Studi di Roma “Tor Vergata”, Via Salaria Km. 29.5, 00100 Roma, Italy — 3Enrico Fermi Center Roma, Italy

Aqueous protein solutions in the presence of co-solvent have been investigated with SAXS and SANS. Data analysis allows to determine the equilibrium constant of the bulk/solvent-layer co-solvent exchange and the protein-protein interaction potential.

MON2F1.4 18:10

Ab initio numerical GW many body effects in the electronic structure of real free-standing graphene — 1Paolo E. Trevisanutto1,2, Christine Giorgetti1,2, Massimo Ladisa1,3, Lu-cia Reining2,3, Massimo Ladisa1,3, and Paolo Mariani1 — 1Istituto di Struttura della Matiera (ISM) CNR, Bari, Italy — 2Laboratoire des Solides Irradiés, CNRS - CEA, École Polytechnique, Palaiseau, France — 3Istituto di Cristallografia, CNR, Bari, Italy

The electron electron dynamic correlation effects in the real free standing graphene have been investigated by using an ab initio GW many body approximation.
MON2F3.4  17:50
Interface exchange interactions in pulsed laser deposited CoPt/CoNi(1-x)O films — •Sara Lauri3, Elisabetta Agostinelli1, Dino Fiorani4, Alberto Maria Testa3, Gaspari Varvaro4, Amanda Generosi2, Barbara Paci2, and Valerio Rossi Albertini5 — 1ISM-CNR, Area della Ricerca Roma1, Via Salaria km 29.500- Monterotondo Scalo (RM) Italy — 2ISM-CNR, Area della Ricerca Roma2, Via Fossato del Cavaliere, 100 (RM), Italy

The aim was to study the magnetic exchange interactions in fcc CoPt/CoNi(1-x)O films grown by PLD. The system seems promising for obtaining exchange bias properties at room temperature, by modulation of the oxide stoichiometry.

MON2F4.3  17:50
First-order transition behaviour in presence of dilution in 3D — Luis Antonio Fernandez1,2,3, Antonio Gordillo-Guerrero2,3, Victor Martin-Mayor1,3, and Juan Jesus Ruiz-Lorenzo2,3 — 1Dept. Física Teórica. Universidad Complutense, 28040 Madrid, Spain. — 2Dept. Física Universidad de Extremadura, 06071 Badajoz, Spain. — 3Instituto de Biocomputación y Física de Sistemas Complejos (BIFI), 50009 Zaragoza, Spain.

Using a novel microcanonical method (entropy, rather than free energy, is the basic magnitude) we found a first-order phase transition in the presence of quenched disorder for the system (for the site-diluted four states Potts model).

MON2F4.4  17:50
Non-Fermi liquid regime in the two-dimensional Hubbard model at weak-to-moderate coupling — •Hermann Freihe1, Eberth Correa2, and Alvaro Ferraz2 — 1Max-Planck-Institute for Solid State Research, D-70569 Stuttgart, Germany — 2International Center for Condensed Matter Physics, Universidade de Brasilia, Caixa Postal 04607, 70910-900 Brasilia-DF, Brazil.

We study the 2D Hubbard model at weak-to-moderate coupling within a two-loop field-theoretical renormalization group approach. As a result, we find evidence of a non-Fermi liquid regime right in between the antiferromagnetic insulating and the d_{x^2−y^2}-wave superconducting phases.

MON2F4.5  18:10
Non-Fermi liquid in the periodic Anderson model — •Adriano Amarucci1,3, Giovanni Sordi1, and Marcelo Rozenberg1,3 — 1Laboratoire de Physique des Solides, Université de Paris-Sud, Orsay 91405, France — 2Dipartimento di Fisica, Università di Roma “Tor Vergata”, Roma 00133, Italy. — 3Departamento de Fisica. Universidad de Buenos Aires, Buenos Aires (1428), Argentina.

We show, within DMFT, the existence of a non-Fermi liquid state in the periodic Anderson model. We show that, down to very small temperatures, coupling to long-wavelength magnetic fluctuations isn’t prerequisite to breakdown Fermi liquids.

MON2F4.6  18:10
Shear-induced inhibition of the crystal nucleation and growth of crystals from solution — •Geoffrey Mitchell1, Supatra Wongsour2, Fred Davis1, and Robert Olley1 — 1Polymer Science Centre, University of Reading, Whiteknights, Reading RG6 6AF UK. — 2Department of Chemistry, Naresuan University, Phitsanulok 65000 Thailand

We show for the first time, that the nucleation and growth of crystals of a low molar mass compound from solution can be inhibited by shear flow which we attribute to a shear-dependent collision cross-section.
Spintronics: Fundamentals and Recent Developments

Albert Fert
UMP CNRS/Thales, 91767 Palaiseau, France

After an introduction on the fundamentals of spintronics and the discovery of GMR, I will review recent developments in this field: magnetic switching and microwave generation by spin transfer, spintronics with semiconductors and molecular spintronics.

TUE1A.1 9:40
Site-Controlled Quantum Dots with Tunable Emission Energy
Marco Felici, Arun Mohan, Benjamin Dvir, Kirill A. Karlsson, Giorgio Biasiol, Lucia Sorba, and Eli Kapon

Growth of InGaAs quantum dots (QDs) in sub-µm pyramidal recesses enables a superior control of the QD position and emission energy. This is exploited to achieve optimal coupling between single QDs and photonic crystal cavities.

TUE1F1.1 (Invited) 9:40
Vibrational Properties of Icosahedral Quasicrystal in Mg–Sc–Zn Alloy
Marek Mihalkovic and Marc de Boissieu

Vibrational properties of icosahedral quasicrystal with supreme structural quality, i-MgScZn, are studied using effective pair interactions fitted to the database of first-principles forces and structural energies.

TUE2 10:00
Optical Gain in Silicon Quantum Dots
Elena Degoli, Roberto Guerra, Olivia Pulci, and Stefano Ossicini

Dipartimento di Scienze e Metodi dell’Ingegneria, Università di Modena e Reggio Emilia, 41100 Reggio Emilia, Italy — Dipartimento di Fisica, Università di Modena e Reggio Emilia, 41100 Modena, Italy — European Theoretical Spectroscopy Facility (ETSF) and CNR-INFM.

This talk presents experimental and theoretical results on protein aggregation. The main focus will be on novel ways of probing and analysing the kinetics of amyloid growth and the mechanical properties of amyloid fibrils.

Tuomas Knowles, Mark Welland, and Christopher Dobson

This talk presents experimental and theoretical results on protein aggregation. The main focus will be on novel ways of probing and analysing the kinetics of amyloid growth and the mechanical properties of amyloid fibrils.

Vibrational properties of icosahedral quasicrystal with supreme structural quality, i-MgScZn, are studied using effective pair interactions fitted to the database of first-principles forces and structural energies.
9:40 – 11:00  
**TUE1F5:** Magnetism - Magnetoelectron-ics I  
*Chair: A. D. Wieck, Ruhr-Universität, Bochum, Germany*

**TUE1F3.1 (Invited) 9:40**  
Magnetic tunnel junctions — **Paulo Freitas** — INESC, Lisbon, Portugal  
Magnetic tunnel junctions will be discussed.

9:40 – 11:00  
**TUE1F4:** Superconductivity and Highly-Correlated Systems - New Materials with Strong Correlations I  
*Chair: O. Gunnarsson, Max-Planck-Institut für Festkörperforschung, Stuttgart, Germany*

**TUE1F4.1 (Invited) 9:40**  
Strongly correlated superconductivity and Mott transition of expanded $A_3C_{60}$ alkali fullerides — **Erio Tosatti**$^1$, **Massimo Capone**$^4$, **Michele Fabrizio**$^{1,2,3}$, and **Claudio Castellani**$^5$ — $^1$SISSA, Via Beirut 2/4, 34014 Trieste (Italy) — $^2$DEMCOCRITOS-INFM, Unità di Trieste, Via Beirut 2/4, 34014 Trieste (Italy) — $^3$ICTP, Strada Costiera 11, 34014 Trieste (Italy) — $^4$SMC, CNR-INFM Dipartimento di Fisica, Università “La Sapienza”, P.le Aldo Moro 2, I-00185, Roma, Italy, and ISC-CNR, Via dei Taurini 19, I-00185 Roma, (Italy) — $^5$Dipartimento di Fisica, Università “La Sapienza”, P.le Aldo Moro 2, I-00185, Roma, Italy  
DMFT solution of a 3-band Hubbard model yields a phase diagram close to that of expanded alkali fullerides $A_3(spacer)C_{60}$, indicating that superconductivity in these materials is both phonon driven and strongly correlated, with similarities to cuprates and organics.

9:40 – 11:00  
**TUE1F6:** Liquids, Disordered and Off-Equilibrium Systems - High Frequency Dynamics in Disordered Systems  
*Chair: G. Ruocco, Università La Sapienza, Roma, Italy*

**TUE1F6.1 (Invited) 9:40**  
Science and Challenges at the European Synchrotron Radiation Facility — **Francesco Sette** — European Synchrotron Radiation Facility, Grenoble, France  
The European Synchrotron Radiation Facility and its Users* Community are launching an innovative Upgrade Programme to address major research areas of Material Sciences in the next decade(s) which are relevant to nano-sciences, life-sciences, energy, transport and environment.
Curved crystals: a smart approach to surface science — ●Martina Corso, Frederick Schiller, Laura Fernandez, Javier Cordón, and Enrique Ortega — 1DIPC, Manuel Lardizábal 3, E-20018 San Sebastián, Spain — 2Universidad del País Vasco, Dpto. Física Aplicada I, Plaza Oñate 2, E-20018 San Sebastián, Spain — 3Unidad de Física de Materiales CSIC/UPV, Manuel Lardizábal 3, E-20018 San Sebastián, Spain

The structural and electronic properties of Au(111) and Cu(111) curved samples are presented in view of STM and ARPES investigations. Their optimal use as set of nanotemplates is exploited with decoration experiments.

Electronic states of Cu vicinal surface nanopatterned by oxygen-induced reconstruction — ●Carlos Eduardo Viol Barbosa, Jun Fui, Giancarlo Pannone, and GIORGIO Rossi — TASC National Laboratory, INFM-CNR, SS 14, km 163.5, I-34012 Trieste, Italy

Control of oxygen dose on Cu(332) surface induces CNR, SS 14, km 163.5, I-34012 Trieste, Italy — TASC National Laboratory, INFM-gio Rossi — Jun Fuji, and GIORGIO Rossi — 1DIPC, Manuel Lardizábal 3, E-20018 San Sebastián, Spain — 2Universidad del País Vasco, Dpto. Física Aplicada I, Plaza Oñate 2, E-20018 San Sebastián, Spain

We study electron confinement and magnetism of reconstructions with periodicity from 3 to 10 nm. Control of oxygen dose on Cu(332) surface induces CNR, SS 14, km 163.5, I-34012 Trieste, Italy — TASC National Laboratory, INFM-gio Rossi — Jun Fuji, and GIORGIO Rossi — 1DIPC, Manuel Lardizábal 3, E-20018 San Sebastián, Spain — 2Universidad del País Vasco, Dpto. Física Aplicada I, Plaza Oñate 2, E-20018 San Sebastián, Spain

Shape Oscillations of SiGe Islands on Patterned Si(001) Substrates — ●Maxun Zhang, Dietmar Pachinger, Friedrich Schäffler, Vladimir Jovanovic, Lis Nanner, and Günter Bauer — 1Institut für Halbleiter und Festkörperphysik, Johannes Kepler Universität, Altenbergstrasse 69, A- 4040 Linz, Austria — 2Laboratory of Electronic Components Technology and Materials, DINES, Delft University of Technology, 2628 CT Delft, The Netherlands

The morphological evolution of SiGe islands on patterned Si(001) substrates at a low Ge growth rate has been investigated. After the formation of dome-shaped islands, the islands evolve to barn-shaped and subsequently back to dome- and finally to barn-shaped again.


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Electromagnetic emission during plastic deformation in ionic crystals — Vlassios Hadjicontis, Claire MAVROMATOU, Tatiana Antsygina, and Konstantin Chishko — 1University of Athens, Panepistimiopolis, Zografos, TK 157 84, Athens, Greece — 2B. Verkin Institute for Low Temperature Physics and Engineering, 47 Lenin Ave., 61103 Kharkov, Ukraine

The minimal Cu and Zn binding site sequence in amyloid beta peptides: an XAS study — Vella Minicocci, Francesco Stella, Massimiliano Comai, Mauro Dalla Serena, Cristina Potrich, Wolfram Meyer-Klaucke, and Silvia Morante — 1Laboratorio di Trento, I-38100 Povo (TN), Italy — 2Consiglio Nazionale delle Ricerche, Fondazione Bruno Kessler, Istituto di Biofisica, Unità di Trento, I-38100 Povo (TN), Italy — 3European Molecular Biology Laboratory, c/o DESY, Notkestrasse 85, D-22603 Hamburg, Germany — 4CRS-SOFI, c/o Dipartimento di Fisica, Università di Roma La Sapienza, I-00185 Roma, Italy

X-ray Absorption Spectroscopy has been used to study the local structure around the metal in AJ peptides complexed with Cu or Zn ions and we recognized two different structures according to the complexed metal ion.


X-ray Absorption Spectroscopy has been used to study the local structure around the metal in AJ peptides complexed with Cu or Zn ions and we recognized two different structures according to the complexed metal ion.
TUE1F3.2 10:20
EELS analysis of interfaces in magnetic junctions — Giovanni Bertoni1,2, Jo Verreirck2, Corinne Ulhaq-Bouillet3, David Halley3, andThomas Fix3 — 1Fondazione Istituto Italiano di Tecnologia (IIT), via Morego 30, IT-16163 Genova, Italy — 2Electron Microscopy for Materials Science (EMAT), Université de Namur, Groenenborgerlaan 171, B-2020 Antwerp, Belgium — 3Institut de Physique et Chimie des Matériaux de Strasbourg, UMR 7504 ULPCNRS, 23 rue du Loess, BP 43, F-67034 Strasbourg Cedex 2, France
We present results on magnetic junctions consisting of few epitaxial layers. Electron energy loss in a scanning transmission microscope allows to investigate chemical concentrations and possible diffusion at metal/oxide interface.

TUE1F4.2 10:20
Band dispersions in fulleride films and bulk vs surface contribution in angle-resolved photoelectron spectroscopy — Andrea Goldoni — Sincrotrone Trieste, s.s.14 km 163.5 in Area Science Park, 34012 Trieste, Italy
The presence of band dispersions in fulleride films was demonstrated by photoemission. The LUMO lineshape in K3C60 remain the same by reducing the photon energy down to 6 eV: bulk and surface properties are similar.

TUE1F5.3 10:40
Resonant tunneling magnetoresistance in MnAs/GaAs/MnAs junctions — Garcia Vincent1, Jaffre Henri2, George Jean Marie2, Marangolo Massimiliano3, Ed-drief Mahmoud1, and Etgens Victor1 — 1INSF, Université Pierre et Marie Curie, Paris, France — 2Unité Mixte de Physique CNRS-Thales,Palaiseau
A resonant transport picture through a midgap defect band in a GaAs barrier can explain the intricate TMR bias dependence measured of fully epitaxial MnAs/GaAs/MnAs. The influence of an homogeneous distribution is also dicussed.

TUE1F4.3 10:40
Effects of Three-Dimensional Band Structure in Angle- and Spin Spin-Resolved Photoemission from Half-Metallic La2/3Sr1/3MnO3 — Juraj Krempasky — Paul Scherrer Institut, CH-5232 Villigen - PSI, Switzerland
We present an angle- and spin-resolved photoemission study of half-metallic LSMO. A reduction of the spin contrast is compared to simulations.

TUE1F6.2 10:20
High frequency dynamics and structural relaxation process in liquid ammonia — Paola Ghura1, Roberta Angelini2, Frederic Datchi3, Giancarlo Ruocco1, and Francesco Sette3 — 1IMPMC, Université Pierre et Marie Curie-Paris 6, 140 Rue de Lourmel, Paris, F-75015 — 2CNR-INFM CRS-SOFT Università di Roma “La Sapienza” P.le Aldo Moro 2, I-00185, Roma, Italy — 3European Synchrotron Radiation Facility, Btê de Postale 220, Grenoble, France
The THz timescale dynamic structure factor of l-NH3 is reported. The structural relaxation time and strength are extracted and the influence of the hydrogen bond and of the network connectivity on them pointed out.

TUE1F6.3 10:40
The Boson peak and its relation with acoustic attenuation in glasses — Benoit Rufflé1, Dmitri Pashin2, Eric Courtes3, and René Vacher3 — 1Laboratoire des Colloides, Verres et Nanomateaux, Université Montpellier II, F-34095 Montpellier Cedex 5, France — 2Sant Petersburg State Technical University, 195251 Saint Petersburg, Russia
Recent experimental results on the density of states and on the acoustic modes of glasses in the THz region are reviewed and compared to the predictions of existing theories.
Dangling-bond transitions in single-domain diamond C(111)-2x1 surfaces —• Gian Lorenzo Bussetti, Claudio Goletti, Piero Chiadra, and Trevor Derry — 1Dipartimento di Fisica and CNISM, Università di Roma Tor Vergata, Roma, Italy — 2School of Physics and Centre of Excellence in Strong Materials, University of Witwatersrand, Johannesburg, South Africa

Reflection Anisotropy Spectroscopy has been applied to measure the optical gap between filled and empty intrinsic surface states on a single-domain diamond C(111)-2x1. Therefore the semiconducting character of this surface has been definitively ascertained.

Atomic and electronic structure of non-polar 6H-SiC(11-20) and GaN(1-100) surfaces —• Marco Bertelli, M. Wenderoth, A Rizzi, J Homoth, P Loeptien, M Wenderoth, J Malindretos, R G Uhrich, M C Righi, L Martin-Samos, C M Righi, and A Catellani — 1Physikalisches Institut and Virtual Institute of Spin Electronics (VISel), 2Institute of Strong Materials, University of Duisburg-Essen, 3Laboratorio Nazionale TASC INFM-CNR, 4University of Göttingen, 5University of Düsseldorf, 6Univeristario per le Scienze Fisiche della Materia. — 1Institut für Physik, Universität Augsburg, 86135 Augsburg, Germany — 2University of Düsseldorf, 3University of Göttingen, 4University of Rome “Tor Vergata”, 5Universita’ di Modena e Reggio Emilia, CNISM, Consorzio Interuniversitario per le Scienze Fisiche della Materia. — 3CNR-IMEM, Parco Area delle Scienze, 47A, I-43010 Parma, and S3, Italy.

Filled and empty states STM topographies with atomic corrugation were measured for non-polar 6H-SiC(11-20) and GaN(1-100) surfaces. The experimental STM topographies show unreconstructed surfaces for both 6H-SiC and GaN in agreement with theory.

Hydrogen-induced plastic deformation of rare earth metal thin films and comparison with corresponding nanoparticles —• Mathias Getzlaff and Astrid Pundt — 1University of Düsseldorf, D-40225 Düsseldorf, Germany — 2University of Göttingen, D-37077

Spin Hall Effect in a 2DEG with Magnetic Couplings —• Peter Schwab, Michael Dzierek, Cosimo Gorini, Mirko Milletta, Luigi Colombo, and Roberto Raimondi — 1University of Freiburg, Institut für Physik, 2CNISM and Dipartimento di Fisica e Informatica per le Scienze della Terra, Università di Trento, and 3Institut f"ur Theorie der Elektronenstruktur, Technische Universität Dresden.

Strong Repulsive Interactions in Polyelectrolyte-Liposome Clusters close to the Isoelectric Point: a Sign of an Arrested State —• Simona Sensato, Domenico Truzzolillo, Federico Bordi, and Cesare Cametti — Dipartimento di Fisica e Informatica per le Scienze della Terra, Università di Trento, Italy.
Spin torque oscillator using a tilted easy-axis fixed layer — **Yan Zhou, Chao Lin Zha, Stefano Bonetti, Johan Persson, and Johan Åkerman** — Department of Microelectronics and Applied Physics, Royal Institute of Technology, Electrum 229, 164 40 Kista, Sweden

Low-energy electrodynamics and metal to insulator transition in strongly correlated vanadium oxides — **Benoit Houssiniere, Cren Tristan, Vaju Cristian, Jochen Krause, and Etienne Janod** — Institut des Materiaux Jean Rouxel (IMN), Universite de Nantes, CNRS, 2 rue de la Houssiniere, 44322 NANTES, France — **3**Institut des Nanosciences de Paris (INSP), CNRS UMR 7588, Universite Paris 6 (UPMC), 140 rue de Lourmel, 75015 Paris, France — **3**INAC, SPSMS, CEA Grenoble, 17 rue de Martyrs, 38054 GRENOBLE, France

Ideal Foam Models via Surface Energy Minimization — **Frank Heilmann** — BASF SE, 67056 Ludwigshafen, Germany

Experimental Evidence of Different Arrested States in a Charged Colloidal System — **Barbara Ruzicka** — Research Center SOFT INFM-CNR Dipartimento di Fisica Universita’ “La Sapienza” Roma, Italy

Current-induced Domain Wall Dynamics— Mathias Klaui — Fachbereich Physik und Zukunftskolleg, University of Konstanz, Konstanz, Germany

Current-induced Domain Wall Excitations by Electric pulses and AC currents are comprehensively reviewed. Direct imaging as well as magnetotransport measurements are employed to determine wall motion, wall spin structure transformations and oscillations.

LaNiO$_3$/LaAlO$_3$ heterostructures - a possible analogon to highTc cuprates — **Philipp Hansmann$^1$, Alessandro Toschi$^1$, Xiaoping Yang$^1$, Giyiyat Khalifullin$^1$, Ole Krog Andersen$^1$, and Karsten Held$^{1,2}$** — Max Planck Institute for Solid State Research, Heisenbergstrasse 1, D-70569 Stuttgart, Germany — **1**Institute for Solid State Physics, Vienna University of Technology, 1040 Vienna, Austria

We study the effect of strong correlations in LaNiO$_3$/LaAlO$_3$ heterostructures with LDA+DMFT to investigate possible analogies to ins-electronic cuprate structures. The paramagnetic phase is metallic with strong antiferromagnetic fluctuations, similar to the cuprates.

Electric pulse induced insulator to metal transition and possible superconductivity in the GaTa$_4$Se$_6$ Mott insulator — **Vaju Cristian$^1$, Carlo Laurent$^1$, Corazza Benoît$^1$, Janod Etienne$^1$, Dubost Vincent$^2$, Cren Tristan$^2$, Roditchev Dimitri$^2$, Braithwaite Daniel$^3$, and Chauchet Olivier$^1$** — **1**Institut des Materiaux Jean Rouxel (IMN), Universite de Nantes, CNRS, 2 rue de la Houssiniere, 44322 NANTES, France — **2**Institut des Nanosciences de Paris (INSP), CNRS UMR 7588, Universite Paris 6 (UPMC), 140 rue de Lourmel, 75015 Paris, France — **3**INAC, SPSMS, CEA Grenoble, 17 rue de Martyrs, 38054 GRENOBLE, France

GaTa$_4$Se$_6$ is a fragile Mott insulator which undergoes a metal-insulator transition (MIT) under pressure. Here we show that application of short electric pulses induces an Electronic Phase Separation, a non-volatile MIT and granular superconductivity.

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Tuesday 26 August 2008

Göttingen, Germany
Surface modification of thin Gd films and high islands representing nanopatterns during hydrogen adsorption as well as absorption has been investigated on the nanometer scale by means of scanning tunnelling microscopy.

"E. Amaldi", Universita di Roma Tre, Via della Vasca Navale 84, 00146 Rome, Italy
We examine the influence of magnetic impurities and magnetic fields on the spin Hall effect in a 2DEG. In both cases we find a finite spin Hall conductivity, for which we give explicit expressions.

TUE2M.4 12:30
Structure and Optical Properties of the Sh-Stabilized GaSe(001) Surface — •CONOR HOGAN1,2, RITA MAGNI4, and RODOLFO DEL SOLE1 — 1Department of Physics and European Theoretical Spectroscopy Facility (ETSF), University of Rome “Tor Vergata”, Via della Ricerca Scientifica 1, I-00133 Rome, Italy — 2Conseil National delle Ricerche (CNR-INFM) — 3CNR-INFM-SS and Dipartimento di Fisica, University of Modena and Reggio Emilia, Via Campi 213/A, I-41100 Modena, Italy
We perform theoretical calculations of the surface optical response and total energy for various models of the Sh-rich GaSe(001) surface, and compare with experiment. The importance of spin-orbit coupling is examined.

TUE2A.4 12:30
Exchange energies for two-dimensional systems: exploring Gaussian approximations — •STEFANO PITALIA1,2, ESA RAZA1,2, and ERBENIRK K. U. GROS1,2 — 1Freie Universitat Berlin, Arnimallee 14, D-14195 Berlin, Germany — 2European Theoretical Spectroscopy Facility (ETSF)
Motivated by the need of improved approximate density functionals for the energies of two-dimensional systems, we consider Gaussian approximations for the exchange energy of spin-polarized, current-carrying states. Good performance is verified for two-dimensional quantum dots.

TUE3A.1 14:40
Optical conductivity of graphene in the visible region of the spectrum — •TORIAS STAUBR1, NUNO PERES1, and ANDRE GEIM2 — 1Center of Physics and Physics Department, University of Minho, P-4710-057 Braga, Portugal — 2Manchester Centre for Mesoscience and Nanotechnology, University of Manchester, Manchester M12 5DQ, United Kingdom
We compute the optical conductivity of graphene beyond the Dirac cone approximation, including trigonal warping and next-nearest neighbour hopping. We then obtain the transmission and reflection coefficients which are also valid in the dispersive optics regime.
A novel spin torque oscillator, where the magnetization of the fixed layer is tilted out of the film plane, has been theoretically shown to be capable of strong microwave signal generation in zero magnetic field.

We analyze the transport properties of ballistic quantum wires with a localized spin-orbit (Rashba) interaction. We find a strongly modulated current that can be tuned with external magnetic field.

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By combining confocal microscopy and simulations, we present quantitative evidence that gelation is driven by an arrested liquid-gas separation in colloidal systems with short-range polymer-induced depletion attraction[1].

The thermodynamical behaviour of graphene is still largely unexplored. We present the temperature dependence of structural and mechanical properties of graphene, calculated by large scale atomistic Monte Carlo simulations based on the bond-order-potential LCBOPII.
A conductivity kink observed in the T-dependence of strongly correlated two-dimensional holes in undoped GaAs-FETs likely indicates a phase transition. The density-dependence of the kink locations exhibits a dichotomy at the critical density of MIT.

Possible Finite Temperature Phase Transition in Strongly Correlated GaAs Two-dimensional Holes in Zero Field — Jian Huang1, Jian-Sheng Xia2, Daniil Tschi2, Loren Pfeiffer3, and Ken West3 — 1Department of Physics, Taylor University, Upland, IN 46989, USA — 2Department of Physics, University of Florida, Gainesville, Florida, USA — 3Department of Electrical Engineering, Princeton University, Princeton, New Jersey 08544, USA — 4Bell Labs, Lucent Technologies, Murray Hill, New Jersey 07974, USA

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Second Sound Influence on Heat Processes in the Superfluid $^3$He-$^4$He Mixtures at Low Temperatures — Konstantyn Nemchenko and Svetlana Rogova — Energy Physics Department, Karazin Kharkiv National University, Kharkiv, UA-61077, Ukraine

Heat transfer in the superfluid $^3$He-$^4$He mixtures at low temperatures is considered. Full thermal flow is calculated. Influence of thermodynamic parameters values on second sound mode fraction in thermal flow is studied.

Strong electronic correlations in Li$_2$ZnPc organic metals — Marta Filibian1, Pietro Carretta1, Maria Cristina Mozzati1, Paolo Gigna2, Giorgio Zoppellaro3, and Mario Ruben1 — 1Department of Physics " A. Volta", University of Pavia, Via Bassi 6, I-27100 Pavia, Italy — 2Department of Physical Chemistry “M. Rolla”, University of Pavia, V.le Taramelli 16, I-27100 Pavia, Italy — 3Institut für Nanotechnologie, Forschungszentrum Karlsruhe, 76021 Karlsruhe, Germany

Li$_2$ZnPc are novel strongly correlated metals. From NMR, EPR and magnetization measurements we show that these compounds are close to a metal-insulator transition where a scenario analogous to the one of A$_x$C$_{60}$ can develop.

Transmission and Reflection of Phonons and Rotons at the Superfluid Helium-Solid Interface, and their Contributions to Osmotic Pressure — Igor N. Adamenko1, Konstantin E. Nemchenko1, Igor V. Tanatarov2, and Adrian F.G. Wyatt3 — 1Karazin Kharkov National University, Svobody Sq. 4, Kharkov, 61077, Ukraine — 2Akhiezer Institute for Theoretical Physics, NSC KIPT, Academycheskaya St. 1, Kharkov, 6108, Ukraine — 3School of Physics, University of New South Wales, Sydney, Sydney, Australia

Interfacial phenomena and microstructural arrangement in superconducting Sr$_2$RuO$_3$-Sr:Ru:O$_x$: eutectic crystals — Antonio Vecchione1, Rosalba Fitzpatrick1, Mario Cuoco2, Regina Ciancio1, Daniela Stornaiuolo2, Detlef Born3, Francisco Tapury2, Eva Olsson3, Shinichiro Kittaka4, Yoshitetu Maeno4, and Sandro Pace1 — 1CNR-INFM Laboratorio Regionale SuperMat and Universita’ di Salerno Dipartimento di Fisica, Via Consolato di Lecce 2, I-84084, Fisciano (Salerno), Italy — 2CNR-INFM Laboratorio Regionale SuperMat and Universita’ di Salerno Dipartimento di Fisica, Via Consolato di Lecce 2, I-84084, Fisciano (Salerno), Italy — 3Laboratoire pour l’Utilisation du Rayonnement Electromagnetique, CNRS, 15 rue des Martyrs, 38054 Grenoble Cedex, France — 4CNR-INFM Laboratorio Regionale SuperMat and Universita’ di Salerno Dipartimento di Fisica, Via Consolato di Lecce 2, I-84084, Fisciano (Salerno), Italy

We present a density functional investigation of X-ray magnetic circular dichroism spectroscopy,
in presence of correlation effects. Results at the L₂,₃ edges of bulk transition metals and selected molecular compounds will be discussed.

IT-84081 Baronesse (Sa), Italy — 2-CNRS-INFM Coherentia and Dipartimento di Scienze Fisiche, Universita' di Napoli Federico II, Napoli, Italy — 3-Microscopy and Microanalysis, Department of Applied Physics, Chalmers University of Technology, Goteborg, Sweden — 4-Department of Physics, Kyoto University, Kyoto 606-8502, Japan

Sr₂RuO₄-Sr₂Ru₂O₇ eutectic crystals superconductivity has been studied at the interface between the two phases and in a Sr₂Ru₂O₇ domain cut from the eutectic. Our study outlines the relationship between crystals structure and superconductivity.

TUE3F3.4 16:00
Atomic structure and electronic properties of realistic Fe/ZnSe(001) interfaces from first principles — 1-Massimiliano Marangolo and Fabio Finocchi — Institut des NanoSciences de Paris (INSP), Paris, France
We study several models for Fe/ZnSe(001) within DFT and analyze the DOS and spin polarization. Most stable interfaces contain mixed Zn-Fe layers in contact with Se-terminated ZnSe(001) and explain XPS data and the measured low TMR.

TUE3F4.5 16:00
Dynamics of Weyl quasiparticles in the presence of quantum noise — 1-Giuseppe Falci — MATIS-INFM, Unità di Catania — Dipartimento di Metodologie Fisiche e Chimiche (DMFCI), Università di Catania
Effects of quantum noise on the dynamics of quasiparticles in graphene are studied by an exact mapping to a conditional spin-boson model. Non-secular effects strongly affect the spin dynamics close to the Dirac points.
TUEp.MAG.9 16:30
Synthesis and Characterization of CoOxNi1-xFe2O4 nanoparticles
GIOVANNI ATOLENI, GERSON MARQUÉZ, EDGAR PÉREZ, FULVIO BOLZONI, VICENTE SAGEDEO
1IMEM-CNR Institute Parco Area delle Scienze 37A, 43010 Parma (Italy) — 2Lab. of Magnetism, Fac. of Ciencias, Universidad de Los Andes, Mérida, Venezuela

Nanocrystalline CoOxNi1-xFe2O4 (40-50 nm) were prepared by co-precipitation method using the metal nitrates as precursors. The nanoparticles were characterized by using TEM microscope; X-ray diffraction, magnetization measurements as a function of temperature and magnetic field.

TUEp.MAG.10 16:30
Antisymmetric Exchange in Antiferromagnetic Materials of Rhombohedral Structures — UNIVERSITY OF SILESIA, INSTITUTE OF PHYSICS, UL. MICHAŁA PASHEKOVICH

TUEp.MAG.11 16:30
Hysteresis phenomena, dynamic susceptibility, giant magnetoresistance and cluster spin glass states in the selected spinels and manganites — JÓZEF WARCZEWIKI, JÓZEK KOWALSKI, PAVEL GUSDIN, GREGORZ URBAŃ, GREGORZ WŁADARZ, AND Pawel Rudz
1University of Silesia, Institute of Physics, ul. Wysokogórna 2, 41-900 Katowice, Poland

The phenomena are related to frustration of magnetic moments, magnetocrystalline and exchange anisotropy as well as to reconstruction of AFM and FM clusters caused by the external magnetic field and accompanied by the charge tunneling.

TUEp.MAG.12 16:30
Exchange bias in Co layers deposited on SiO2 substrates — FARID FEITAR1,2, ALINE RAMOS1, HOUSED GARAD1, LUC ORTEGA1, AURELIO MACHON2, STEPHANE AUFFRET3, BERNARD ROIDMAÇQ1, AND BERNARD DUVYN1
1Institut NEEL, CNRS & Université Joseph Fourier BP166 F-38042 Grenoble Cedex 9, France — 2Department of Physics, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain — 3Scientific-Practical Materials Research Centre of NAS of Belarus, 19 P. Brovki Street, Minsk, 220072, Belarus — 4Belarussian State University, 4, Nezavisimosti Avenue, Minsk, 220030, Belarus — 5Instituto de Física, Universidad Federal do Rio Grande do Sul, 91501-970 Porto Alegre, RS, Brazil

We present a method and a test stand for measurement of the magnetoresistive sensors. The sensors, based on GMR principles, La0.54Sm0.11Sr0.35Mn1-xO0.3 thin film, have a good response in the 50 to +50 C temperature range.

TUEp.MAG.13 16:30
Ferromagnetic behaviour at RT of a 6 Å thick Co layer deposited on Si/SiO2 — HOUSED GARAD1, FARID FEITAR1,2, ALINE RAMOS1, LUC ORTEGA1, AURELIO MACHON2, STEPHANE AUFFRET3, BERNARD ROIDMAÇQ1, AND BERNARD DUVYN1
1Institut NEEL, CNRS & Université Joseph Fourier BP166 F-38042 Grenoble Cedex 9, France — 2Department of Physics, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain — 3Scientific-Practical Materials Research Centre of NAS of Belarus, 19 P. Brovki Street, Minsk, 220072, Belarus — 4Belarussian State University, 4, Nezavisimosti Avenue, Minsk, 220030, Belarus — 5Instituto de Física, Universidad Federal do Rio Grande do Sul, 91501-970 Porto Alegre, RS, Brazil

A few angstroms thick Co layer deposited onto SiO2 by ion beam sputtering presents a ferromagnetic behaviour at room temperature, differently from results published in the literature concerning low-thickness Co layers deposited on oxides.

TUEp.MAG.14 16:30
Method and Experimental Stand for Testing a Magnetoresistive Sensors — FABIO FETTAR1,2, MIREI LIU CHLAUS3, MIHAJ LOZOVAN3, CAR- MEN MITA3, NICOLETA CORNII3, AND NIANCO CORPUS4

We present a test stand and a method to perform a measurement for the magnetoresistive sensors. The sensors, based on GMR principles, La0.54Sm0.11Sr0.35Mn1-xCoO3 thin film, have a good response in the -50 to +50 C temperature range.

TUEp.MAG.15 16:30
Anisotropic reinforcement of nanocomposites tuned by magnetic orientation of the filler network — JACQUES JESTIN, FABRICE COUSIN1, EBBALE DUHOS1, CHRISTINE MÉNAGER2, RALPH SCHWING3, JULIEN OBIERES2, AND FRANÇOIS BOUL3
1Laboratoire Léon Brillouin (LLB), CEA/CNRS, CEACachy 91191 Gif/Yvette France — 2Laboratoire Léon Brillouin (LLB), CEA/CNRS, CEACachy 91191 Gif/Yvette France

We present an innovative nanocomposite in which anisotropic mechanical reinforcement can be tuned by application of an external magnetic field resulting from the local orientation of the filler network probed with neutron scattering (SANS) measurements.

TUEp.MAG.16 16:30
Temperature spin dynamics in the molecular magnetic ring Cr7Ni — JORGES LAGANCHALET1,2, FERDINANDO BORSA1, EDUARDO MICOTTO1, AND MAURIZIO CORI1

Spin dynamics in Cr7Ni ring using nuclear spin-lattice relaxation rate have been studied. Investigations in the temperature range around 30 K have been performed as a function of the temperature at different applied magnetic field.

TUEp.MAG.17 16:30
Interfacial properties of metallic/oxide interfaces in Pt/Co/AOx trilayers by hard X-Ray Reflectivity — HOUSED GARAD1, FARID FEITAR1,2, ALINE RAMOS1, LUC ORTEGA1, AURELIO MACHON2, STEPHANE AUFFRET3, BERNARD ROIDMAÇQ1, AND BERNARD DUVYN1
1Institut NEEL, CNRS & Université Joseph Fourier BP166 F-38042 Grenoble Cedex 9, France — 2Department of Physics, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain — 3Institut NEEL, CNRS & Université Joseph Fourier BP166 F-38042 Grenoble Cedex 9, France — 4Department of Physics, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain — 5Institut NEEL, CNRS & Université Joseph Fourier BP166 F-38042 Grenoble Cedex 9, France

We present a method and a test stand for measurement of the magnetoresistive sensors. The sensors, based on GMR principles, La0.54Sm0.11Sr0.35Mn1-xO0.3 thin film, have a good response in the 50 to +50 C temperature range.

TUEp.MAG.18 16:30
Magnetic properties of hydrogen plasma treated fullerene films — TATJANA MAKAROVA1, INNA ZAKHAROVA1, OLEG KVYTKOVSKYI2, SERGEI BUGA4, ALEKSANDR VOLKOY2, AND ANDREI SHELANKOY2
1University, 90187, Umeå, Sweden — 2Institute for Physical Chemistry, University of Milan, Via Saldini 50, 20133 Milan, Italy — 3Polytechnical University, St Petersburg, Russia — 4Technological Institute for Superhard and Novel Carbon Materials, 142190 Troitsk, Moscow Region, Russia

Photopolymerization of fullerenes films treated by hydrogen plasma creates a metastable magnetically ordered phase. Under structural relaxation the magnetic phase transforms to a diamagnetic mixture of C60 molecules, C60-C60 chains and singly bonded H-C60-C60-H dimers.

TUEp.MAG.19 16:30
Disagreement for discrimination in physics in the 21 century — SVENT FILIP2, ANDRAS RADWANSKI3, AND ZOFIA ROPKA1 — 1Center of Solid State Physics, Smt Filip 5, 31-150 Krakow, Poland

We inform the scientific community about ongoing disagreement of the localised crystal-field-based understandings of magnetism and electronic character of transition-metal 3d/4f/5f compounds, in particular in compounds exhibiting heavy-fermion phenomena and Mott insulators.
Focused Ion Beam fabrication and magneto-optical characterization of interacting single crystal Fe nanomagnets on MgO(001) — Alessandro di Bona1, Luca Signorolfi2, Gian Carlo Gazzadi1, and Sergio Valeri1,2 — CNR-INFM, Centro di Ricerca S3, via Campi 213/A, 41100 Modena, Italy — Universidad de Sevilla, Avda. Reina Mercedes 41, 41012 Sevilla, Spain

We report on growth-induced, magnetic anisotropy of single crystal Fe films grown on MgO(001) and its dependence on deposition conditions and coupling-induced magnetic anisotropy in arrays of square nanomagnets fabricated by Focused Ion Beam.

Magnetic Polaritons in Metamagnet Layered Structures — Paulo Mauro1, Manoel Vascconcelos1, Carlos Araujo1, and Eudension Albuquerqu2 — Departamento de Ciencias Exatas, CEFET-MA, Brazil — Departamento de Fisica, UFRN, Natal, Brazil

Magnetic polariton propagation in layered structures, made up by the stacking of a metamagnetic and a non-magnetic insulator layers, is theoretically studied by using a transfer matrix approach, considering all phases of the metamagnetic material.
Materials.

Tuesday 26 August 2008

**Poster Session - Methods for Cultural Heritage and Vacuum Science**

**TUEp.CUL.1** 16:30

Optical Coherence Tomography (OCT): a tool for imaging and spectroscopy on works of art — **Gaël Latour**, Julien Moreau**, Mady Elias**, and Jean Marc Frigerio**

— 1Institut des Nanosciences de Paris, Paris, France — 2Laboratoire Charles Fabry, Palaiseau, France

Optical Coherence Tomography (OCT) is a non-invasive and non-destructive technique which is very promising to analyse works of art. Three-dimensional imaging is realized but it is also possible to obtain spectral information from studied materials.

**TUEp.CUL.2** 16:30

The nanolime in Cultural Heritage conservation; treatment effectiveness on different natural lithotypes. — **Giovanna Taglieri**

— Department of Chemistry, Chemical Engineering and Materials, University of L'Aquila, Monteluco di Roio, I-67040 L'Aquila, Italy

In this work a nanolime, to be used in Cultural Heritage conservation, is produced and characterized in order to evaluate its carbonation process. The obtained nanoparticles are applied on natural lithotypes (Poggio Pincezze, Traversino and Basalito).

**TUEp.CUL.3** 16:30

Effect of firing on the structural properties of archaeological ceramics investigated by NMR T1-T2 correlation — **Cinzia Cameri**, Francesco De Luca**, and Camilla Terenzi**

— 1Research Center SOFT-INFM-CNR, Università ‘Sapienza’, P.le Aldo Moro 2, I-00185 Roma, Italy — 2Dipartimento di Fisica, Università di L'Aquila, V. Vetoio 10, I-67010 Coppito, L'Aquila, Italy

— 3Dipartimento di Fisica, Università ‘Sapienza’, P.le Aldo Moro 2, I-00185 Roma, Italy

T1-T2 correlation maps obtained by low resolution single-sided NMR may constitute an innovative fingerprinting tool for non-destructive ancient ceramic characterization, providing a marker of compositional and porosimetric properties induced by firing.

**TUEp.CUL.4** 16:30

Acoustical analysis of the big bell Tuba Dei as a tool for investigating its origin — **Paolo Lotti**, Giorgia Bianchi**, Simona Riva**, Gianni Antonolli**, and Remo Reverberi**

2Dipartimento di Chimica, Università di Parma, Italy — 3Dipartimento di Fisica, Università di Parma, Italy — 4CSAC, Università di Parma, Italy

Felt-tip pens inks, used in graphics, have been investigated by micro-FT-IR, micro-Raman, colormetry and SEER. Discriminant analysis has been applied also on aged materials. An application on Sottsass 1960-70's drawings is presented.

**TUEp.CUL.5** 16:30


— Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy — 2Dipartimento di Fisica, Università di L'Aquila, Via Vetoio 10, I-67010, L'Aquila, Italy — 3Dipartimento di Fisica, Università ‘Sapienza’, P.le Aldo Moro 2, I-00185 Roma, Italy

— 4CSAC, Università di Parma, Italy

The acoustic analysis of the big bell Tuba Dei in Europe - ”Tuba Dei” from Torun's cathedral in Poland is given and conclusions about probable origin of the bell and its master are presented.

**TUEp.CUL.6** 16:30

Acoustical analysis of the big bell Tuba Dei as a tool for investigating its origin — **Krzysztof P. Przegietka**

— Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy — 2Dipartimento di Fisica, Università di L'Aquila, Via Vetoio 10, I-67010, L'Aquila, Italy — 3Dipartimento di Fisica, Università ‘Sapienza’, P.le Aldo Moro 2, I-00185 Roma, Italy

— 4Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy

— 5Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy

— 6Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy

— 7Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy

— 8Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy

— 9Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy

— 10Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy

— 11Institute for Multidisciplinary Nanotechnologies, CNR-IMN, P.le Aldo Moro 2, I-00185 Roma, Italy

The acoustic analysis of the big bell Tuba Dei in Europe - ”Tuba Dei” from Torun’s cathedral in Poland is given and conclusions about probable origin of the bell and its master are presented.
Methylene Blue-Semiconductor Nanocrystal Hybrid System for Photodynamic and Photochemical Applications — Aliaksaandra Rakovich1, Tatiana Rakovich2, Vincent Kelly3, Yuhi P Rakovich4, and John F Donegan5

1 Semiconductor Photonics Group, School of Physics and Centre for Research on Adaptive Nanostructures and Nanodevices, Trinity College, Dublin, Ireland — 2 RNA Biology Group, School of Biochemistry and Immunology, Trinity College, Dublin, Ireland

We report the development of novel hybrid material with enhanced photochemical properties, based on methylene blue and CdTe nanocrystals, with the aim of exploiting this system for photovoltaic and photodynamic therapy applications.

Deep Level Parameters From Frequency Resolved Capacitance Spectroscopy (FRCS) Under Pressure — Ashok Kumar Saxena — I.I.T., Roorkee (Uttarakhand) India

The contribution has been withdrawn by the authors.

Collective elementary excitations of twodimensional magnetoelectrons in a state of Bose-Einstein Condensation with arbitrary wave vectors — Svetoslav Moskalenko, Michael Liberman2, and Evgeniy Dumanov

1 Institute of Applied Physics of the Academy of Sciences of Moldova, Academic Str. 5, Chisinau, MD2028, Republic of Moldova — 2 Department of Physics, Uppsala University, Box 530, SE-751 21, Uppsala, Sweden

We present ab initio calculations at the level of Hartree-Fock + 2nd-order Møller-Plesset perturbation theory applied to extended systems — Martin Mariman, Andreas Grünewälder, and Georg Kresse — Faculty of Physics, University Vienna, and Center for Computational Materials Science, Sensengasse 8/12, A-1090, Vienna, Austria

We develop a diagrammatic formalism for the evaluation of the ground state energy of a four-electron system in a quantum dot in a magnetic field for Wigner, spin-singlet and broken symmetry spin-singlet states — Artak Avetsyan1, Konstantinos Moulopoulos2, and Anahit Djotyan2 — University of Antwerp, Department of Physics, Groenenborgerlaan 171, B-2020 Antwerp — 2 University of Cyprus, Department of Physics, P.O. Box 20537, 1678, Nicosia, Cyprus — 3 Yerevan State University, Department of Physics, A. Manoogian 1, Yerevan-0025, Armenia

We develop a diagrammatic formalism for the evaluation of the ground state energy of a four-electron system in a quantum dot in a magnetic field for Wigner, spin-singlet and broken symmetry spin-singlet states.

Effect of internal crystal structure of quantum dot (wire)-in-matrix system on Raman scattering spectra — Anatoliy Yaremko, Volodymyr Dzhigan, and Volodymyr Yukhymchuk — Lashkaryov Institute of Semiconductor Physics, NAS of Ukraine, Kyiv 03028, Ukraine

Raman scattering from quantum dot (wires)-in-matrix system is studied theoretically using the Green function method with taking into account the crystal structure of both the matrix dot and surrounding matrix.

Quantum Hall Effect in Double Quantum Wells Made of the InAs-Based Heterostructures — Michael Yakunin1,2, Sergey Podgornyi1, Vladimir Neverov1, Anne de Visser2, Gianni Galistu1, and Yuri Sadofyev3 — 1 Institute of Metal Physics, RAS, Ural Branch, S. Kovalevskaya Str., 18, Ekaterinburg-GSP 170, 620041, Russia — 2 Van der Waals - Zeeman Institute, University of Amsterdam, Valckenierstraat 65, 1018 XE Amsterdam, The Netherlands — 3 Department of Electrical Engineering and Center for Solid State Electronic Research, Arizona State University, Tempe, Arizona 85287-5706

Unconventional features are observed in the quantum magnetotransport of double quantum wells (DQWs) made of InGaAs/AlGaAs and InAs/AlAs heterostructures, which are attributed to a large bulk g-factor than in traditional GaAs/AlGaAs DQWs.

Electronic Structure and Magnetism of ZnS, ZnO, and Cu2O-based Compounds Doped with 3d Transition Metal Ions — Tatiana Surkov2, Vadim Galakhov1, and Ernst Kuzmenko2 — Ural Division of the Russian Academy of Sciences, 620041 Ekaterinburg GSP-170, Russia

We show an influence of synthesis conditions on the local structure of impurity atoms of 3d elements and magnetism in semiconductor compounds. For this aim we have used X-ray absorption and X-ray emission spectroscopies.

Electronic excitations of homologous classes of polycyclic aromatic hydrocarbons for applications in photonics and electronics — Giancarlo Capellini1, Giuliano Malloggi2, and Gianrico Muscarella2

1 CNR-SCALCIS, Dipartimento di Fisica - Universita’ di Cagliari, Monserrato (Ca), Italy — 2 INAF - Osservatorio Astronomico di Cagliari, Capoterra (Ca), Italy

We report a systematic study of the electronic structure and the absorption spectra of some oligoacenes, n-phenacenes, and oligorylenes. General trends as a function of molecular size are reported.

Tunable Photonics with Optically Driven Color Centers in Diamonds — Jin Hui Wu1,2, Giuseppe La Rocca2, and Maurizio Artoni1 — 1 Department of Physics, Jilin University, Changchun, China — 2 Scuola Normale Superiore Pisa, Italy — 3 Department of Chemistry and Physics of Materials, University of Brescia, Italy

Inhomogeneously broadened optical transitions of nitrogen-vacancy centers in diamond may be employed with a bandwidth that can be devised to improve light storage efficiencies in solids quantum memory devices.

Nonlinear JFET: electronic structure and low-field mobility — Bart Sorek2 and Wim Magnus1,2 — 1 IMEC, Kapeldreef 57, B-3001 Leuven, Belgium — 2 Universiteit Antwerpen, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium

We consider a uniformly doped surrounding gate nanowire operated in JFET mode. We perform a self-consistent Poisson-Schroedinger calculation to obtain the electronic structure and calculate the low-field mobility taking into account the relevant scattering mechanisms.

Spin-Dependent Resonant Tunneling Current via Landau States Bound to Magnetic
It has been shown methodic of formation of porous silicon by the electrochemical etching without added applied source voltage. The surface morphology of porous silicon was very important for enhancement of electron field emission parameters.

TUEp.SEMI.15 16:30

Ultrafast nonlinear absorption and optical Kerr effect in chalcogenide glasses — Ivan Blonskyy1, Viktor Kadan1, Oleh Shpottyk2, Igor Pavlov1, and Mihail Iovu3

1 Dept. of Photonic Processes, Institute of Physics NAS of Ukraine, 46 Prospект Nauky, Kyiv, 03028, Ukraine — 2 Scientific Research Company “Catat”, 202, Styriska Str., Lviv, 79031, Ukraine — 3 Institute of Applied Physics AS of Moldova, Str. Academiei, 1, MD-2028 Chisinau, Moldova

Ultrafast nonlinear absorption for intra- and interband excitation and optical Kerr effect was measured in bulk chalcogenide glasses. Physical mechanisms of the absorbance dependence on mutual pump/probe polarization and other observed phenomena are discussed.

TUEp.SEMI.16 16:30

Spectral properties and dynamics of transient absorption induced by femtosecond laser pulses in BK7 glass — Ivan Blonskyy1, Viktor Kadan1, Oleh Shpottyk2, and Igor Pavlov1

1 Dept. of Photonic Processes, Institute of Physics NAS of Ukraine, 46 Prospект Nauky, Kyiv, 03028, Ukraine — 2 Scientific Research Company “Catat”, 202, Styriska Str., Lviv, 79031, Ukraine

Time- and spectrally-resolved measurements of absorption induced by femtosecond laser pulses in BK7 glass show that at delays > 300 fs dominant absorption mechanism is governed not by free carriers, but most probably by excitons.

TUEp.SEMI.17 16:30

Electron field emission from porous silicon layers grown by electrochemical etching without application of external voltage — Mykola Semenenko and Anatoly Evtukh

Laboratory of Physics of the Academy of Sciences of the Czech Republic, v.v.i, Cukrovarnicka 10, CZ-16200 Prague, Czech Republic

We report the catalyst-free growth of GaAs and InAs nanowires on Si by molecular beam epitaxy. Well ordered arrays of nanowires of both materials have been obtained. Electron microscopy is used to characterize the nanowires.

TUEp.SEMI.19 16:30

Surface conductivity of epitaxial graphene measured by microscopic probes — Cécile Naud1 and Silvia Rubini2

1 Laboratoire TASC, INFM-CNR, 34012 Trieste, Italy — 2 Laboratoire de Physique de l’Ecole Normale Supérieure, CNRS, 24 rue Lhomond, 75005 Paris, France

We present investigations on the structural and electronic structure of epitaxial graphene in connection with transport properties. In order to perform these direct measurements we are using microscopic multi-probes.

TUEp.SEMI.20 16:30

Effect of the microwave radiation treatment on photoluminescence spectra of gallium arsenide — Roman Redko1 and Vitaliy Sokolov2

1 V. Lashkaryov Institute of Semiconductor Physics, National Academy of Science of Ukraine, 45, prospect Nauky, 03028 Kyiv, Ukraine — 2 Fakultät Elektrotechnik und Informationstechnik, Technische Universität Berlin, 10587 Berlin, Germany

To study the long time effect of microwave radiation treatment on a radiative recombination in GaAs, we have obtained that the spectra of luminescence after treatment are changed as well as concentration of local centers.

TUEp.SEMI.21 16:30

Peculiarities of radiative recombination in indium phosphide caused low magnetic field treatments — Swatlana Redko1 and Volodymyr Redko2

1 V. Lashkaryov Institute of Semiconductor Physics, National Academy of Science of Ukraine, 45, prospect Nauky, 03028 Kyiv, Ukraine — 2 Scientific Research Company “Catat”, 202, Styriska Str., Lviv, 79031, Ukraine

Multiphonon resonant Raman scattering in self-assembled quantum disks is investigated using a nonadiabatic approach. The calculated ratio of the two- and one-phonon integral intensities is close to the experimental data for self-organized InAs/GaAs quantum dots.

TUEp.SEMI.22 16:30

All-electric detection of the polarization state of terahertz laser radiation — Sergei Danilov1, Wolfgang Weber1, Josef Kriermaier2, Peter Olbrich3, Dieter Schuh4, Werner Wegschneider5, Dominique Bougard6, Gerhard Abstreiter7, Wilhem Prettl1, and Sergey Ganichev1

1 Technische Universität Berlin, Physikalisches Institut, Hardenbergstrasse 36, D-10623 Berlin, Germany — 2 Institute of Applied Physics, University of Regensburg, D-93040 Regensburg, Germany — 3 Walter Schottky Institute, TU Munich, D-85748 Garching, Germany

Time- and spectrally-resolved measurements of absorption induced by femtosecond laser pulses in BK7 glass show that at delays > 300 fs dominant absorption mechanism is governed not by free carriers, but most probably by excitons.

TUEp.SEMI.23 16:30

One-dimensional transport in nanoscaled conductors : revisiting the Boltzmann equation — VDM Magnus1,2, Fons Brossens1, and Bart Soree2

1 Universiteit Antwerpen, Departement Fysica, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium — 2 Universite of Antwerpen Microelectronics Centre (IMEC), Kapeldreef 75, B-3001 Leuven, Belgium

We have investigated diffusive and ballistic transport of electrons coexisting in a one-dimensional confining potential. To this end we have solved the inhomogeneous Boltzmann equation in the relaxation time approximation, using the characteristic curves method.

TUEp.SEMI.24 16:30

Raman Scattering in Self-Assembled InAs/GaAs Quantum Dots — Sergey N. Klimin1, Vladimir M. Fomin2, Karol Kiermaier1, and Ivan Blonskyy

1 National Academy of Science of Ukraine, 41, Prospekt Nauky, 03028 Kyiv, Ukraine — 2 University of Regensburg, Institute of Physics, Bvd. Tempere 10, D-93040 Regensburg, Germany

On 3-dimensional Quantum Hydrodynamic Model for a Photovoltaic Nanostructure — Ioan Zaharie1, Ioan Zapevski2, Bogdan Cârstea3, and Ioan Luminosu4

1 University of Bucharest, Faculty of Physics, Department of Physics, Bvd. Unirii 1B, B-01231 Bucharest, Romania — 2 Institute of Solid State Physics, Academy of Sciences of Moldova, Str. Academiei, 1, MD-2028 Chisinau, Moldova — 3 University of Bucharest, Institute of Solid State Physics, P.O. Box 924, B-077125 Bucharest, Romania — 4 University of Bucharest, Faculty of Physics, Department of Physics, Bvd. Unirii 1B, B-01231 Bucharest, Romania

In this paper a theoretical model for the behavior of the propagation of electrons in a photovoltaic cell (the electron density and the current density functions) and has as the starting point the Schrödinger equation.

TUEp.SEMI.25 16:30

Imbalanced Fermi Gas in a Trap: Beyond the Mean-Field Approach — Jacques Tempere1, Serghei N. Klimin2, and Jozef T. Devreese3

1 Theoretische Fysica van de Vaste Stoffen (TFVS), Universiteit Antwerpen, B-2020 Antwerpen, Belgium — 2 Institut für Festkörperphysik, Technische Universität Berlin, PN 5-2, Hardenbergstrasse 36, D-10623 Berlin, Germany

We represent a path-integral treatment of trapped cold fermions with a population imbalance taking into account fluctuations beyond mean-field and effects of nonzero temperature. The calculated and measured density profiles compare favorably to each other.

TUEp.SEMI.26 16:30

On All Optical Quantum CNOT Gate Design Using Semiconductor Quantum Dots — Vlastimir Kräpke1, Jiří Oswald2, Alice Hopsdov-Kovář2, Karla Kudlová2, Jiří Pangrac2, Karél Melichar2, and Eduard Hulíček2

1 Institute of Condensed Matter Physics, Masaryk University, Kotlářská 2, CZ-61137 Brno, Czech Republic — 2 Institute of Physics of the Academy of Sciences of the Czech Republic, v.v.i, Čukrovnická 10, CZ-16200 Prague, Czech Republic

We report on InAs/GaAs quantum dots with ultra-thin capping layers exhibiting an efficient luminescence around 1.55 μm. The high emission wavelength is explained by the reduced strain and increased volume.

TUEp.SEMI.27 16:30

All Optical Quantum CNOT Gate Design Using Semiconductor Quantum Dots — Vlastimir Kräpke1, Jiří Oswald2, Alice Hopsdov-Kovář2, Karla Kudlová2, Jiří Pangrac2, Karél Melichar2, and Eduard Hulíček2

1 Institute of Condensed Matter Physics, Masaryk University, Kotlářská 2, CZ-61137 Brno, Czech Republic — 2 Institute of Physics of the Academy of Sciences of the Czech Republic, v.v.i, Čukrovnická 10, CZ-16200 Prague, Czech Republic

We report on InAs/GaAs quantum dots with ultra-thin capping layers exhibiting an efficient luminescence around 1.55 μm. The high emission wavelength is explained by the reduced strain and increased volume.
TIUEP SEMI.32 16:30
Theory of Hole Mobility in Ge P-channel Inversion Layer — Xian Zhang1,2, Massimo Fischetti1, Bart Sohre1, and Wim Magnus2,3
1University of Massachusetts, 01003 Amherst, USA — 2IMEC, Kapeldreef 75, B-3001, Leuven, Belgium — 3University of Antwerp, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium

A theoretical study of the hole mobility in Ge p-channel inversion layer for relaxed and compressive/tensile biaxial strained cases is performed. The calculated mobility will be compared with mobility measurements.

TIUEP SEMI.33 16:30
Full multiple scattering X-ray absorption investigation of hydrogen-nitrogen complexes in GaAsN — Giacomo Citto1, Federico Boscherini1, Francesco Filipponi2, Giuseppe Mattioli1, Aldo Amore Bonapasta2,3, Maria Bertì4, Gabriele Bergomi2, Davide Iotti4, Daniele Iotti4, Alberto Polimeni1, Mario Capizzì1, Silvia Rubini1, Faustino Martelli1, and Alfonso Franciosi6
1Synchrotron SOLEIL, L’Orme des Merisiers, 91191 Gif-sur-Yvette, France — 2Laboratorio Nazionale TASC INFM-CNR, Area Science Park, S.S. 14, Km. 163.5, 34012 Trieste, Italy — 3Materials Science Department, University of Pavia, via Marzolo 8, 35131 Padova, Italy — 4CNISM, University of Bologna, Viale C. Berti 4, 40136 Bologna, Italy — 5Department of Physics, Sapienza Università di Roma, Piazzale A. Moro 2, 00185 Roma, Italy — 6CNISM and NAFT Instruments, Via C. Lombardo, 18, 50144 Florence, Italy

We present our latest results regarding the fabrication of II VI group semiconductor nanowires fabrication using the template method. Multiseggment nanowires with tailored transport properties were also fabricated by this approach.

TIUEP SEMI.31 16:30
Exciton -Donor Complexes and Trions in Parabolic Semiconductor Quantum Dots in a Magnetic Field — Aashing Dhiyavan1, Abark Avetisyan2, Edward Kazarjan3, and Konstantinos Moulopoulos4
1Department of Physics, Yerevan State University, 1 A.Manoogian , Yerevan-0025, Armenia — 2Department of Physics, Kyushu University, Fukuoka, Japan — 3Russian *Armenian (Slavonic) State University, Yerevan, Armenia — 4Department of Physics, University of Cyprus, P.O. Box 20537, 1678, Nicosia, Cyprus

We have investigated the energetics of an exciton-donor complex as well as of a trion in semiconductor quantum dots in external magnetic field in adiabatic and non-adiabatic approximations, using a variational approach.

TIUEP SEMI.34 16:30
Electronic structure of fluorites: a DFT-LDA systematic study — Emiliano Cadelano1, Giancarlo Cappellini1, and Vincenzo Fiorentini1,2 — 1SLACS-CNMI and Dipartimento di Fisica, Università di Monserrate (Cagliari), Italy

We study the electronic structure of fluoride crystals, BaF2, CaF2, CdF2, PbF2, SrF2, by means of density functional theory within the local density approximation for the exchange correlation energy (DFT-LDA).

TIUEP SEMI.35 16:30
First-Principle investigations of intrinsic and Si-doped GaAs nanowires — Mirhad Ghaed1,2, Maria Peressi1,3, and Nadia Bingelli1,4 — 1CNRM-INM DEMOCRITOS Theory@Elettra Group, Trieste, Italy — 2Dep. of Physics, Isfahan Univ. of Technology, Iran — 3Dep. of Theoretical Physics, Univ. of Trieste, Italy — 4CTCP, Trieste, Italy

We investigate by first principles pseudopotential calculations the structural stability and the electronic properties of intrinsic GaAs nanowires and the relative stability of different donors and acceptors configurations in Si-doped nanowires with different diameters.

TIUEP SEMI.36 16:30
Fabrication and Properties of Transition-Metal Doped ZnO Nanowires — Elena Matei1 — 1National Institute for Materials Physics, Bucharest-Magurele, Romania

We present our new preparation on presentation ZnO nanowires doped with cobalt or with copper and manganese in nanoporous membranes. We found that the dopant concentration in the nanowires can be controlled by the deposition potential.

TIUEP SEMI.37 16:30
Fowler-Nordheim tunneling in Fullereen/Silicon hybrid hetero-junction diodes — Saeed Zamiri1,2, Gebhard Matt3, Thomas Fromhertz4, Christoph Luggenschmidt5, Mateusz Budzorze5, and Serhiy Niyazi Sariciftci2,3,4 — 1Konarka Technologies, Austria — 2Linz Institute for Organic Solar Cells (LIOS), Johannes Kepler University, Austria — 3Institute of Semiconductor and Solid State Physics, Johannes Kepler University, Austria — 4Konarka Technologies, Austria

We report on the electrical properties of Silicon/Fulleren hetero-junction diodes. A detailed analysis of the IV-characteristics featuring a Fowler-Nordheim tunneling will be presented.

TIUEP SEMI.38 16:30
Optical Investigation on the SiC by using Scanning Laser Microscopy Techniques — George Stanču1, Stefán Stanču2, Radu Hrust1, and Eustathios Polychroniadis2 — 1Center for Microscopy- Microanalysis and Information Processing, University Politehnica of Bucharest, Romania — 2Department of Physics, Aristotle University of Thessaloniki, Greece

The aim of this work is to present the results which we obtained by using different scanning laser microscopy techniques for investigations of silicon carbide (SiC).

TIUEP SEMI.39 16:30
Peculiarities of the linear propagation of light in semi-infinite fibre arrays — Ksenia Lyakhovskaya1 and Petr Khadzhii2 — 1Dnister State University, Tiraspol, MD 3900, Moldova — 2Institute of Applied Physics, Academy of Sciences of Moldova, Kishinev, 2028, Moldova

The spatial intensity distribution of laser radiation propagating in semi-infinite directional coupler based on Chebyshev, Hermitean, Legendre, and other types of polynomials, with different dependences of coupling constants on the fibre number is studied.

TIUEP SEMI.40 16:30
A Non-equilibrium Green’s Functions Solver for Fast Transients in Semiconductors — Andrea Kalvová1, Bedřich Velický2, and Václav Špička1 — 1Institute of Physics, v.v.i, Academy of Sciences of the Czech Republic, Na Slovance 2, 182 21 Praha 8, Czech Republic — 2Charles University, Faculty of Mathematics and Physics, DCMP, Ke Karlovu 5, 121 16 Praha 2, Czech Republic

A novel Non-equilibrium Green’s Functions solver for fast transients in semiconductors is presented combining a direct solution with reduction by Quasiaparticle Kadanoff-Baym Ansatz and satisfying the non-equilibrium Ward identity.

TIUEP SEMI.41 16:30
Experimental evidence of n-diamond nanocrystals self-assembling — Marco
The effects of quantum well numbers on optical properties of GaAs/GaInNAs quantum well structures — Ayse Erci, Metin Aslan, M. Cetin Arikan, Sakarya, Turkey — 2 Dipartimento di Scienze dei Materiali, Università di Salento, Via per Monteroni, 73100 Lecce, Italy

We report about the possibility to achieve single-crystal-like organized 3D particles (with size of some hundreds of nm), using as building blocks n-diamond (s.g. F-43m) nanocrystals (with size of few nm).

TUEp.SEMI.42 16:30
The effects of quantum well numbers on optical properties of GaAs/GaInNAs quantum well structures — Ayse Erci1, Metin Aslan2, M. Cetin Arikan3, and Mika Saarinen3 — 1 Istanbul University, Faculty of Science Physics Department Esentepe Campus, Sakarya, Turkey — 2 Dipartimento di Scienze dei Materiali, Università di Salento, Via per Monteroni, 73100 Lecce, Italy

As-grown and annealed GaInNAs/GaAs samples with 1, 3, 5, and 7 quantum wells were investigated using photoluminescence, photoconductivity, and in-plane photovoltage in order to determine the effects of the number of quantum wells.

TUEp.SEMI.43 16:30
Fabrication and Characterization of ZnO Semiconductor Thin Films by Electron Beam Evaporation Technique with Argon Plasma Assistance — Vivienne Falcão1,2, Milena Sarino1, Diego Miranda1, and José Roberto Branco1 — 1 CETEC, Belo Horizonte, Brasil — 2 CEFET-OP, Ouro Preto, Brasil

ZnO semiconductor thin films have been deposited on glass substrates by e-beam evaporation with argon plasma assistance. The films show good optical and electrical properties which make it a good material for solar cells applications.

TUEp.SEMI.44 16:30
Hybrid nanocrystal-fullerene heterojunctions for photovoltaics — Michele Sara, Agnieszka Gocalinska, Fabrizio Cordella, Francesco Quochi, Andrea Mura, and Giovanni Bongiovanni — Dipartimento di Fisica, Università di Cagliari, I-09042 Monserrato (CA), Italy

We measured the time needed to extract photogenerated carriers from colloidal quantum dots embedded in organic matrix and compared it with non-radiative Auger recombination time. Electron extraction dynamics turns out to be crucial for photovoltaic applications.

TUEp.SEMI.45 16:30
Quantum transport in 2D electron-hole system at a type II broken-gap p-GaInAsSh/p-InAs single heterointerface in high magnetic fields — Konstantin Moiseev1, Vyacheslav Bereozovets2,3, Maya Mikhailova1, Robert Parfeniev1, and Victor Nizhnikovskii2 — 1 A.F. Ioffe Physico-Technical Institute, RAS, 26 Politekhnicheskaya St., St. Petersburg, 194021, Russia — 2 International Laboratory of High Magnetic Fields and Low Temperatures, Wroclaw, 50-204, Poland

Planar and vertical quantum magnetotransport in a 2D electron-hole system at a single type II broken-gap InAs/GaInAs heterointerface has been studied. Spin-oriented tunneling current of electrons across the heteroboundary through 2D-interface states was found out.

TUEp.SEMI.46 16:30
Theory of Förster Resonant Energy Transfer in Two Dimensions Applied to a Mixed Quantum Dot Monolayer — Manuela Lune1, Louise Bradley1, Tim Chen2, and Yumi Gun-Ko2 — 1 conductor Photonic Group, School of Physics, Trinity College Dublin, Dublin 2, Ireland — 2 School of Chemistry, Trinity College Dublin, Dublin 2, Ireland

The Förster radius and energy transfer efficiencies in a mixed CdTe quantum dot monolayer can be analyzed using only lifetime measurements. Efficiencies of around 90% have been observed for acceptor:donor ratios larger than 1:1.

TUEp.SEMI.47 16:30
Effect of electronic excitations on spinodal decomposition of semiconductor solid solutions — Alexander Maslov and Olga Froshna — Ioffe Physical Technical Institute, St. Petersburg, Russia

The effect of elementary excitation on spinodal decomposition of semiconductor solid solution is investigated theoretically. The critical temperature $T_c$ and parameters of equilibrium state are calculated for a number of III-V compounds.

TUEp.SEMI.48 16:30
Photonic Band Gaps in Metamaterials — Manoel Vasconcelos1, Paulo Mauriz1, Fabio de Medeiros2, and Eudene Albuquerc2 — 1 Department of Physics, CEUFT-MA, 2 Department of Physica, UFRN, Brazil

We investigate the photonic band gaps spectra in quasiperiodic polaritonic photonic crystals, composed of both positive (silica) and negative (metal) refractive index materials, by using a theoretical model based on the transfer matrix approach.

TUEp.SEMI.49 16:30
Hole Density in (Ga,Mn)As layers grown on (110) and (311) GaAs substrates — Michael Hirmer, Michael Mayer, Tobias Korn, Ursula Wurstbauer, Dieter Schuh, Werner Weigsehied, and Christian Schüller — Universität Regensburg, Germany

We investigate Hall effect and Roman scattering measurements, to determine the hole concentration of thin (Ga,Mn)As epilayers grown on (001), (110), and (311)A substrates before and after annealing, and correlate this to the measured $T_c$.

TUEp.SEMI.50 16:30
Comparison of different techniques to determine long spin lifetimes in slightly n-doped GaAs bulk and GaAs/AlGaAs quantum wells, determined by time-resolved Faraday rotation (TRFR) technique, resonant spin amplification (RSA) technique and Haule effect measurements.

TUEp.SEMI.51 16:30
Electronic states in quantum rings of narrow-gap semiconductors — Clara Gonzalez-Antequera, Mario Amado, and Francisco Dominguez-Adame — GISC, Departamento de Física de Materiales, Universidad Complutense, E-28040 Madrid, Spain

We report on the theoretical electronic structure of two-dimensional quantum rings of finite width made of narrow-gap III-V semiconductors, under strong magnetic fields applied perpendicular to the plane of the quantum ring.

TUEp.SEMI.52 16:30
Flux-tunable Resonant Tunneling Diodes with Aharonov-Bohm-Casher Rings — Francesco Romeo, Giovanni Cipriani, and Maria Marinaro — Department of Physics “E.R. Caianiello” and CNSM Unit, Via S. Al- lende 84081 Baronissi (SA), Italy

We study a mesoscopic ring subject to the Rashba spin-orbit interaction and sequentially coupled to an interacting quantum dot, in the presence of Aharonov-Bohm flux, as proposed in a flux tunable tunneling diode.

TUEp.SEMI.53 16:30
Voltage percolation thresholds in nanocrystalline silicon — Magdalena Lidia Ciurea1, Vladimir Lincu2, and Ionel Stavarache1 — National Institute of Materials Physics, Bld. Al. I. Cuza, 077125 Magurele, Romania

We report on the theoretical electronic structure of two-dimensional quantum rings of finite width made of narrow-gap III-V semiconductors, under strong magnetic fields applied perpendicular to the plane of the quantum ring.
Thin semiconductor films in exciton range —

Two-dimensional samples of layered materials —

Beloussov

We show with examples of measurements.

Energy of sharpening of quantum dots: A new approach —

We study theoretically four-wave mixing, electromagnetically induced transparency and creation of slow light in a two-subband semiconductor quantum well structure, taking into account the effects of electron-electron interactions using a nonlinear density matrix approach.

Two-subband nonlinear optics in a semiconductor quantum well —

We study theoretically four-wave mixing, electromagnetically induced transparency and creation of slow light in a two-subband semiconductor quantum well structure, taking into account the effects of electron-electron interactions using a nonlinear density matrix approach.

Graphene made easy: Large area, two dimensional samples of layered materials —

We present a simple, scalable method for producing large two dimensional samples of layered materials. This opens up perspectives both for fundamental research as well as for applications as we show with examples of measurements.

Transmission of supershort light pulses by thin semiconductor films in exciton range of spectrum —

Taking into account the exciton-photon and elastic exciton-exciton interactions we investigated peculiarities of transmission of supershort light pulses by thin semiconductor films. We predict the appearance of time dependent phase modulation and dynamical red and blue shifts of transmitted pulse.

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Intraband contributions to the self-energy corrections in ab initio bandstructure calculations: an extrapolation scheme

- Marco Cazzaniga1,2, Nicola Manni1,2, Luca Guido Molinari1,2, and Giovanni Onida1,2

1 European Theoretical Spectroscopy Facility (ETSF) — 2Università degli Studi di Milano, Physics Department, via Celoria 16, 20133 Milano (Italy)

We calculate the GW corrections for gapless systems including Drude contribution to the screening by an extrapolation of the small-q trend of the independent-particle polarizability.

Dynamics of Weyl quasiparticles in the presence of quantum noise — Giuseppe Falci, MATIS-INFN, Unita’ di Catania — Dipartimento di Metodologie Fisiche e Chimiche (DMFCI), Universita’ di Catania

A combined theoretical and experimental analysis of band structure and recombination processes in 1.5 μm quantum dash lasers — Sorcha Healy1, Simon Osborn1, David Williams2, Eoin O’Reilly1,2, Francois Lelarge1, F. Poing2, A. Accardi3, F. Pommereau3, O. Legouezigou3, and Beatrice Dagens3,1

Tondal National Institute — 1University College Cork — 2Alcatel Thales III-V Laboratory

Calculations show electrons are not confined in the dashes in the 1.5 μm InAs/InGaAsP/InP quantum dash in a well structures. Calculations and photoabsorption measurements show strongly polarized recombination. The threshold current remains dominated by non-radiative paths.

Non-secular pseudospin dynamics, strongly modifies the phics close at the Dirac points.


In this contribution we present the results of our studies on structure, polar properties and mechanism of phase transitions in novel, pure organic, ferroelectric single crystal, TMNB.

Phase Transition in Doped Crystals - BabuR Gadhre — International University for Nature, Society and Man, Dubna, Russia

We investigated influence of the weak disorder on the phase transition. Dependence of critical indexes from fractal dimensions of defects distribution is obtained.

Structure and dynamics of point and extended defects in hard and soft ferroelectrics — Hueddiger-A. Eichel — TU Darmstadt

The defect chemistry of acceptor- and donor-type modified PZT ceramics is characterized by EPR spectroscopy. In particular, models for softening and hardening are developed. Furthermore, the kinetic behaviour is monitored, providing microscopic insight in the mechanism of ferroelectric aging.

Determining of The Electronic Structure of LaCrO3 Ceramic — Somayeh Hoseini1, Mohtapa Servatkhah2, and Hamidolah Salehi1 — 1Physics Dept., Shahid Chamran University of Ahvaz, Ahvaz, Iran — 2Physics Dept., Shiraz University, Shiraz, Iran

The structural and electronic properties of LaCrO3 in cubic and orthorhombic structure were investigated using a FP-LAPW method in the framework of DFT with various Approximations, considering spin-orbital coupling and neglecting it.
Tuesday 26 August 2008

TUEp.MAT.13 16:30

Determination of the Electronic Structure of LaCrO₃ Ceramic — Somayeh Hosseini, Mojtaba Seravatsioh, and Hamidollah Saheli — 1Phys. Dep., Shahid Chamran University of Ahvaz, Ahvaz, Iran — 2Phys. Dep., Shiraz University, Shiraz, Iran

Structural and electronic properties of cubic and homorhomic LaCrO₃ are discussed along the FP-LAPW Density Functional Theory and various approximations, taking account spin-orbital coupling. A strong covalent band between O-O, Cr-O, and La-O is found.

TUEp.MAT.14 16:30

Optimisation of CaCo₃ Precipitation Process by Ultrasonic Field — Irinel Chilibon, Carmenca Mateescu, Raluca Iospecu, and Dumitru Tucor — 1National Institute of R&D for Optronics, INOEO-2000, PO Box 28, 77125, Bucharest, Magurele, Romania — 2INCDM, Bucharest-Magurele, Romania — 3UPB, Bucharest, Romania

This paper presents aspects concerning the CaCo₃ process optimisation by ultrasonic field. The ultrasonic field contribute to the improvement of crystalline grain size distribution, important particles fraction of nanometer size and the solubility velocity decreasing.

TUEp.MAT.15 16:30

Oxygen diffusion in Ruddlesden-Popper phase type : the special case of LaCoO₄ — Lorc Le Dréau, Werner Paulus, Juerg Schefter, and Kamizke Conder — 1University Kassel, Science Department, Chemistry, Rechenstr. 12, 34121 Kassel, Germany — 2ETH Zürich & Paul Scherrer Institute, Laboratory for Neutron Scattering, 5232 Villigen PSI, Switzerland

We studied LaCoO₄ single crystals by neutron scattering and revealed a new oxygen long range ordering inducing an interesting oxygen mobility process.

TUEp.MAT.16 16:30

Raman spectroscopic study of pure and Nb-doped PbSnO₃ and PbSnO₃ relaxor ferroelectrics at high pressures — Anna-Maria Welisch, Boriana Mihalova, Ulrich Bismayer, Marín Gospodinov, Rainer Stosch, and Bernd Güttler — 1Universität Hamburg, Geodäkelalle 48, 20146 Hamburg, Germany — 2Institute of Solid State Physics, Štefanikovo nám.47, 814 36 Bratislava, Slovakia — 3PTB Braunschweig, Bundesallee 100, Braunschweig, Germany

Pure and Na-doped Pb-based perovskite relaxors PbSnO₃ and PbSnO₃ NbO₃ were investigated by Raman spectroscopy under high pressure up to 10 GPa at room temperature. New insights into pressure-induced structural transformations are reported.

TUEp.MAT.17 16:30

Magnetic anisotropy of aligned iron-filled carbon nanotube films — Tatiana L. Markov, Lyubov G. Bulusheva, Alexander V. Okotrub, and Alexander G. Kravin — Institute of Materials Physics, National Academy of Sciences, Novosibirsk, 630090 Russia

Films of iron-filled carbon nanotubes oriented perpendicularly to the substrate show differences in saturation magnetization, coercive force and even Curie temperatures for the magnetic field oriented along or perpendicularly the nanotube long axis.

TUEp.MAT.18 16:30

Metallic Nanotubes Prepared by Electrodeposition in Ion Track Membranes — Elena Matei, and Tatiana B. Anisimova — 1National Institute for Materials Physics, Bucharest Magurele, Romania — 2GSI Darmstadt, Germany

We prepared metallic micro and nanotubes by deposition on ion track nanoporous membranes. Self-supporting metallic nanotubes were deposited by a wide field of potential applications obtained by electrochemical thickening.

TUEp.MAT.19 16:30

Influence of additives on electrodeposition of metallic nanowires with magnetic properties — Elena Matei — 1National Institute of Materials Physics, Bucharest Magurele, Romania

We present our results in metallic nanowires preparation, using nonporous membranes as templates. When employing polyvinylpyrrolidone as an additive in the deposition bath, a pore filling efficiency of almost 80% was obtained.

TUEp.MAT.20 16:30

Plasmons in Single-Wall Carbon Nanotubes — Sascha Dmitriev, Tatjana Vukovic, Bozidar Nikolic, Milan Daminjanovic, and Ivanka Milosevic — Faculty of Physics, University of Belgrade, Studentski trg 12-16, P. O. Box 368, Belgrade 11001, Serbia

We have calculated dielectric functions and plasmon excitations in isolated single-wall carbon nanotubes of various chiralities within dipole approximation and RPA. Energetics of π and π+σ plasmon and π plasmon dispersion properties are the main results.

TUEp.MAT.21 16:30

Ab-initio investigation on point defects in SrTiO₃, SrFeO₃, SrMnO₃, and PbScO₃ — Mohammad Ali Damouri, Hamid Ameri, Hamid Reza Moeini, and Nikolai Alippi — 1CNR-IMM, Stradale Primosole 50, I-95127 Catania, Italy — 2CNR-ISM, via Salaria km. 29,300, I-00169 Mon- terotondo Stazione (RM), Italy

CCTO is highly indicated as a ferroelectric relaxor. The question is still open to dispute. Point defects are crucial for this debate. We present a wide theoretical screening of point defects in CCTO.

TUEp.MAT.22 16:30

Raman Scattering from Heterofullerenes and non-Fullerene Peapods — Wolfgang Plank, Hans Kuzmany, Herwig Peterlik, Simona Delugas, and Paul Alippi — 1Theoretical and Physical Chemistry Institute, Rudower Chaussee 6, 12623 Berlin, Germany — 2Faculty of Physics, University of Vienna, Strudlhofsgasse 4, 1090 Wien, Austria — 3Faculty of Materials Science and Engineering, 21st century COE (NanoFactory), Meijo University, Nagoya 468-8502, Japan — 4Theoretical and Physical Chemistry Institute, National Helicen Research Foundation, 48 Vasileos Constantinos Ave., Athens 11635, Greece

We studied peapods prepared with the heterofullerenes and the non-fullerene molecules ferrocene, o-carborane and adenine as filling species. Sample analysis was done by multiple-
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Physics Department

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TUEp.MAT.23 16:30
Exfoliation of Pristine Graphite from Bulk Graphite Using Liquid Phase Systems — • Mustapa Lotya, Yenny Hernandez, and Jonathan Coleman 1,2 — School of Physics, Trinity College Dublin, Ireland — Centre for Research on Adaptive Nanostructures and Nanodevices, Trinity College Dublin, Ireland

We show exfoliation of pristine graphite using liquid phase dispersion systems. The quality of exfoliation is assessed by a range of techniques including extensive transmission electron microscopy.

TUEp.MAT.24 16:30
Electrical features of packed homotype bundles formed by aligned single-walled carbon nanotubes — • Daniela Manno, Ast-tondo Serra, Emanuela Filippo, Maria Letizia Terranova, Silvia Orlanducci, and Marco Rossi — Dipartimento di Scienza dei Materiali, Università del Salento, Lecce, Italy — Dipartimento di Scienze e Tecnologie Chimiche and MINAS, Università di Roma "Tor Vergata", I-00133 Roma — Dipartimento di Energetica and CNIS, Università di Roma "La Sapienza", I-00161 Roma

In this work we report about the morphological, structural and electrical properties of ribbons constituted by homotypic SWCNT bundles. The effects of the bundle-bundle aggregation has been investigated.

TUEp.MAT.25 16:30
Phonon dynamics in Strontium Titanate Ceramics doped with Yttrium — • Abilio Almeida, J. Agostinho Moreira, Alex Pacheco, Tatiana Correia, Paula Vilainho, Da Khelil, and Andrei Khilkin — Department of Physics of Science Faculty, IFIMUP, University of Porto, Rua do Campo Alegre, 687, 4169-007 Porto, Portugal — 2 Department of Ceramics and Glass Engineering, CICECO, University of Aveiro, 3810-193 Aveiro, Portugal

TO1 dynamics of Y-doped STO ceramics has been studied by Raman spectroscopy to look for the existence of a polar state at room temperature suggested by PFM measurements. Discussion of experimental results will be presented.

TUEp.MAT.26 16:30
Polarized emission from micron scale patterns of nanorods ordered by fluid flow and external electric fields — • Roman Krahnke, Concetta Nobile, Luigi Carbone, Giovanni Morello, Milena De Giorgi, Libero Manno, and Raffa Cingolani — National Nanotechnology Laboratory of CNR-INFM, Lecco, Italy

CdSe/CdS nanorods, grown by wet chemistry, were aligned from solution on Si/SiO2 substrates by external electric fields and solvent fluid flow. Micron scale patterns of nanorods ordered in smectic phase show polarized emission of light.

TUEp.MAT.27 16:30
Structure and Properties of Ceramic Multiferroic Composites from PZT-BT Solid Solution — • Cornel Miclea, Constantin Tansaso, Cornelui Florin Miclea, Ion Spaulusescu, Luminita Amarnade, Alin Iuga, Marius Coanghier, Lucian Trupina, Ciprian Tiberiu Miclea, and Madalina Susu — National Institute of Materials Physics, Str. Atomistilor 105 bis, 077125, Magurele-Bucharest, ROMANIA — Hyperion University, Faculty of Physics, Calea Calarasi 169, Bucharest, ROMANIA

In the present investigation we prepared composites of ferroelectric lead zirconate titanate (PZT) and ferroelectric barium titanate (BT) nanorods. These materials were investigated by X-ray diffraction and electron microscopy and the piezoelectric properties were determined.

TUEp.MAT.28 16:30
Layered Structure Characteristics of Product Martensite in Copper Based Shape Memory Alloys — • Osman Adiguzel, Firat University Department of Physics 23169 Elazig / Turkey

Shape memory alloys undergo martensitic transition on cooling from high temperatures. The product phases have the unusual complex structures called long period layered structures such as 9R or 18R depending on the stacking sequence.

TUEp.MAT.29 16:30
Synthesis and luminescent properties of Gd2O3:Eu hollow spheres — • Jianguo Zhou, Yongxin Wang, Huizhen Wang, Fengying Zhao, and Lin Yang — College of Chemistry and Environmental Science, Henan Normal University, Xinxian 453007, Henan Province, P.R.China

In this paper we report for the first time the synthesis of Gd2O3:Eu hollow spheres. The structure and morphology and luminescent properties of Gd2O3:Eu phosphors were studied.

TUEp.MAT.30 16:30
Synthesis and luminescent properties of Y2O3:Eu3+ phosphors — • Jiangbo Zhou, Baolin Wang, Fengying Zhao, and Lin Yang — College of Chemistry and Environmental Science, Henan Normal University, Xinxian 453007, Henan Province, P.R.China

We show exfoliation of pristine graphene using liquid phase dispersion systems. The quality of exfoliation is assessed by a range of techniques including extensive transmission electron microscopy.

TUEp.MAT.31 16:30
phase transitions sequence in BA1-xBxP in system by infrared reflectivity — • Tatiana Dekola, Jose Ribiero, and Luis Vieira — 1 Centro de Física, Universidade do Minho, Campus de Gualtar, 4710-057 Braga, Portugal — 2 Centro de Física, Universidade do Minho, Campus de Gualtar, 4710-057 Braga, Portugal

The temperature dependences of vibrational modes confirm a complex mechanism underlying the phase transitions sequence in mixed in BA1-xBxP system.

TUEp.MAT.32 16:30
Energy Levels Scheme of Cr3+ Doped in LiLi508 Spinel — • Calin Abram, Mikhail Buri, Ilmo Sildos, and Nicolae Avram 1,3 — 1 Department of Physics, West University of Timisoara, Bulevardul Vasile Parn 4, Timisoara 300223, Romania — 2 Institute of Physics, University of Tartu, Riia Street 142, 51014 Tartu, Estonia — 3 Academy of Romanian Scientists, Sapplui Independente Nr.54, 050094 Bucharest, Romania

We calculated energy levels of Cr3+ ion doped in LiLi508 spinel using the exchange charge model. The obtained energy levels and estimated Racah parameters are in good agreement with experimental spectroscopic data.

TUEp.MAT.33 16:30
PtTiO3/PVDF Ceramic/Polymer Composites — • Ionila Chibris, Jose Marat-Mendes, Paulo Inacio, and Rui Igreja — 1 National Institute of R&D for Optoelectronics, INOE-2000, PO Box MG-5, 77125, Bucharest, Romania — 2 Department of Materials Science, Faculty of Science and Technology, University of Lisbon, 2829 - 516 Caparica, Portugal

Paper presents PtTiO3 ceramic powders obtained by sol-gel processing, for ceramic/polymer composites. Two PtTiO3/P(VDF-TrFE) ceramic/polymer composites were made by mixing PT and PVDF powders in 50% fraction volumes, presenting more than 17 kV/m electric field.

TUEp.MAT.34 16:30
Spatial dependence of observed Raman frequencies and disorder in monolayer graphene — • Eno Cazanell1,2, Marco Castrotia1,2, Daniela Paci1,2, Luigi Pappagano, and Gino Mariotto1,2 — 1 Department of Physics, University of Calabria, 87036-Rende (CS), Italy — 2 Laboratory LICRYL CNR-INFM and CEMIF-CAL, 87036- Rende (CS), Italy — Faculty of Sciences, University of Verona, Strada le Grazie 15, 37134-Verona (VR), Italy

The frequency of G’ (2D) Raman band shows a significant spatial dependence only in single layer (1L) graphene: its variation is about 20 cm−1, for displacements of about 10 µm, under the same excitation wavelength.
Thermoelectric mechanism of electromagnetic-acoustic transformation in organic conductors — Danica Krestovska and Olga Galbova – Faculty of Natural Sciences and Mathematics, Department of Physics, P.O. Box 162, 1000 Skopje

The thermoelectric mechanism of electromagnetic-acoustic transformation of energy in layered organic conductors with quasi-2D energy spectrum is considered. It allows new important information on the electronic structure of the organic conductors to be obtained.

Self-organisation of semiconductor conjugated polymers in thin layers and in bulk — Emil J. Samuelsen, Dag W. Brehy, Jens W. Andreassen, and Kalle Lienov

Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway — Polymer Department, Risø National Laboratory, Roskilde, Denmark — Chemical and Biological Science, Polytechnic University, Brooklyn, New York, USA

Deposited semi-conducting conjugated polymer layers are shown to self-organise relative to the substrate, as observed by diffraction and imaging. Additional self-organisation is evidenced through long-period superstructures revealed by small-angle x-ray scattering, interpreted as chain folding.

New Evidence of Molecular Adsorption of O2 on Si(111)-7x7 Surface — Rong-Li Lo1, Ing-Shouh Hwang2, and Tien T. Tsong2

1Department of Physics, National Tsing-Hua University, Hsinchu 300, Taiwan — 2Institute of Physics, Academia Sinica, Nankang, Taipei 115, Taiwan

By direct STM observations of O2-O2 reaction on Si(111)-7x7 surface at high temperatures, we achieve the confirmation of the molecular adsorption of O2 and the explanations for the previous contradictory conclusions on this subject.

Vanishing effects of the Landau level broadening as T → 0 — Ayda Gamgam and Cristine Villagonzalo

Structure and Thermoelectric mechanism of electromagnetic-acoustic transformation in organic conductors — Danica Krestovska and Olga Galbova
Tuesday 26 August 2008

Physics Department

Dynamics Group, National Institute of Physics, University of the Philippines Diliman, Quezon City, 1101 Philippines
The contribution has been withdrawn by the author.

TUEp.SUR.16 16:30
Electronic upconversion effect in nanodevices — Karel Kláž — Institute of Physics of Acad. Sci. of Czech Republic, v.v.i., Prague, Czech Republic
Electronic multiple scattering on the LO phonons can lead to a nonadiabatic effect of spontaneous generation of voltage between contacts of a nanodevice. The theory of the effect is discussed including the relation to experiments.

TUEp.SUR.17 16:30
The binary system Pt/Cu(111):An STM study of heteroepitaxial growth and subsequent alloy formation — Christian Brezlič, Séverine Le Moal, Conrad Becker, and Klaus Wandelt — Institute of Physical and Theoretical Chemistry, University of Bonn, Wegelerstr. 12, D-53115, Bonn, Germany
The heteroepitaxial growth of Pt on a Cu(111) surface in the submonolayer regime has been studied by LT-STM and evaluated quantitatively including the relation to experiments.

TUEp.SUR.18 16:30
Non-standard Dynamic Scaling on Riemannian Interfaces — Carlos Escudero — Instituto de Matemáticas y Física Fundamental, Consejo Superior de Investigaciones Científicas, C/Serrano 123, 28006 Madrid, Spain
Growth phenomena on Riemannian interfaces present properties completely different from their planar counterparts. Fundamental differences are the loss of the interface correlation through time and the irrelevance of the noise in two or higher dimensions.

TUEp.SUR.19 16:30
Characterization of bimetallic Au/Pd(110) surfaces — Marco Moors2, Marco Krahl3, Tobias Pertsch4, Conrad Becker1, and Klaus Wandelt4 — 1Institute of Physical and Theoretical Chemistry, University of Bonn, Wegelerstr. 12, D-53115, Bonn, Germany; 2Faculty of Chemistry, Warsaw University of Technology, Noakowskiego 3, 00664 Warsaw, Poland — 3Institute of Physics, P.O. Box 304, Zagreb HR-10000, Croatia
Au films on Pd(110) as studied with UPS, PAX and STM are found to form pseudomorphic unreconstructed and reconstructed Au overlayers, as well as stable Au/Pd surface alloys, depending on the Au coverage and temperature.

TUEp.SUR.20 16:30
Electron-electron interactions and the magneto-optical properties of graphene — Yuri Rybkon1,2, and Gerhard Martinez1 — 1GhMFLL, CNRS, B.P. 166, Grenoble Cedex 9, France — 2L.D. Landau Institute for Theoretical Physics, 117940 Moscow V-334, Russia
It is shown that the introduction of electron-electron interactions, within the Hartree-Fock approximation, in the magneto-optical response of graphene can explain quantitatively the different re-normalizations of the Fermi velocity as observed experimentally for all transitions.

TUEp.SUR.21 16:30
Probing the Initial Stages of Solid State Reactions — Sonia Pin1, Paolo Ghigna1, Eliana Quarteroni1, Giorgio Spino1, and Franca Marchetti1 — 1Dipartimento di chimica-fisica “M.R.Rola”, University of Pavia, Viale Taramelli 16, 1-27000, Pavia (Italy) — 2GILDA-CRG European Synchrotron Radiation Facility (ESRF), BP 220, F-38043 Grenoble Cedex, France
The initial stages of solid state reactions have been probed. The formation of Zn-Al spinel has been investigated using fluorescence EXAFS as a probe. Different orientations of the AI2O3 sub-strate give different reactivity towards ZnO.

TUEp.SUR.22 16:30
Quantum Confined Stark Effects of Excitons in Wurtzite Nitride Semiconductor Quantum Dots — Wei Yang3 and lei Shi2 — 1College of Science, Inner Mongolia Agricultural University, Hohhot 010018, P. R. China — 2Department of Physics, Inner Mongolia University, Hohhot 010021, P. R. China
Binding energies of excitons in wurtzite nitride quantum dot structures have been studied under an applied uniform electric field by taking the exciton with both branches of LO-like and TO-like interaction into account.

TUEp.SUR.23 16:30
Rotational disorder in few layer graphene films on 6H-SiC(000-1): A scanning tunneling microscopy study — Pierre Mallet, François Varchon, Fanny Hebel, Laurence Magaud, and Jean-Yves Veuillen — Institut de Physique Théorique, C.N.R.S. and Université Joseph Fourier, Boîte Postale 166, F-38042 Grenoble Cedex 9, France
Scanning tunnelling microscopy was performed on few-layer graphene films epitaxially grown on SiC(000-1). Most patterns reveal a misorientation angle between the graphene layers, which yields to an electronic interlayer decoupling detected in our data.

TUEp.SUR.24 16:30
Emission properties of nanostructured surfaces of GaN and AlGaN — Oleksandr Kyriienko1, Anatoliy Evtukh1, Volodimir Litovchenko2, Mykhailo Shchepk1, Oktay Yilmazoğlu1, Hans Hartnagel2, and Dimitris Pavlidis3 — 1Institute of Semiconductor Physics, 41 prospekt Nauki, 03026 Kiev, Ukraine — 2Technische Universität Darmstadt, Institut für Hochfrequenztechnik, Merckstr. 25, 64283 Darmstadt, Germany
Emission properties of nanostructured GaN and AlGaN surfaces have been investigated in details. The nanostructured surface was formed by photoelectrochemical method. The effective electron field emission was observed and explained in frame of proposed model.

TUEp.SUR.25 16:30
The characterization of the energetic states localized on the GaSe single crystal - oxide layer surface — Igor Evtyoev1, Elmira Cuculescu2, and Mihail Caraman1 — Faculty of Physics, Moldova State University, 60 A. Mateevici str., Chisinau, Moldova
The hot-electron energy-loss rate conditioned by acoustic-phonon interaction in a quantum wire is obtained. Both the cases of pure materials and materials containing point defects are considered.

TUEp.SUR.26 16:30
Circular dichroism in photoemission as a fingerprint of surface-related bands in the valence-band structure of a semiconductor — Vidal Fran9, Marangolo Massimiliano1, Torelli Piero2, Ennio Marcello3, and Panaccione Giancarlo3 — INRIP, Université Pierre et Marie Curie, Paris, France — 2INFN-CNR, National Research Centre for nanoStructures and bioSystems at Surfaces, Modena, Italy — 3FASC Laboratory INFN-CNR, Trieste, Italy
Circular dichroism core and valence XPS measurements of the ZnSe(001)-(c(2x2)) surface indicate that surface and bulk components exhibit different polar variations. We identify experimentally surface-related bands in the valence-band spectra based on symmetry considerations.

TUEp.SUR.27 16:30
Nonequilibrium thermodynamics of Griffith crack propagation along interfaces — Robert Goldstein1, Tariel Markvladze2, and Mikhail Sarychev2 — 1Institute for Problems in Mechanics, Russian Academy of Sciences, Moscow, Russia — 2Institute of Physics and Technology, Russian Academy of Science, Moscow, Russia
In the work, using the methods of nonequilibrium thermodynamics, a criterion of quasistatic propagation of Griffith cracks is obtained. Both the cases of pure materials and materials containing point defects are considered.

TUEp.SUR.28 16:30
Orientation and characterization of anisotropic noble metal nanoparticles — Wajid Ahmed, Stefan Yagi, Abend van Sijlhoout, and Bine Poliese1 — Solid State Physics, MESA+ Institute for Nanotechnology, University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands
Electric field-induced orientation of suspended metallic nanorods is investigated using optical techniques. Calculation of nanorod optical properties using Mie theory and the Discrete Dipole Approximation provides a benchmark for in situ monitoring of alignment processes.

TUEp.SUR.29 16:30
Thermal relaxation of electrons due to acoustic-phonon interaction in a quantum wire — Abdarakh Vartanian1, Anna Asatryan2, Lyudvig Vardanyan3, and Albert Khakosyan4 — 1Yerevan State University, Yerevan, Armenia — 2Russian-Armenian University, Yerevan, Armenia
The hot-electron energy-loss rate conditioned by confined acoustic phonons in a quantum wire is
indicated theoretically. The comparison of our results with the experimental results obtained in acoustic phonon scattering regime shows a sufficient agreement.

Tuesday 26 August 2008

22nd General Conference of the Condensed Matter Division of the European Physical Society - Tuesday 26 August 2008
Photoluminescence of strongly coupled J-aggregate microcavities — *V. SOLO MICHELITI* and GIUSEPPE LA ROCCA 1
1Dipartimento di Fisica, Università di Pisa Largo Bruno Pontecorvo 3, 56127 Pisa, Italy.

We build a model able to account for the photoexcitation dynamics of a J-aggregate microcavity. We discuss the main relaxation channels that determine the microcavity photoluminescence and compare our numerical results with the experimental evidences.

TUEP.SUR.44 16:30

Tight binding description of the quantum confined Stark effect in strained Ge-rich quantum well systems — *Michele Vigglio* and GIUSEPPE GROSSO — NEST-CNR-INFM and Dipartimento di Fisica E. Fermi, Università di Pisa, Largo B. Pontecorvo 3, 56127 Pisa, Italy

We investigate numerically the quantum confined Stark effect in Ge-rich SiGe quantum wells for different polarizations of the incident radiation. The evaluated absorption spectrum evidences the possibility of SiGe quantum wells as optical modulators.

TUEP.SUR.45 16:30

The adsorption of Tantalum at a Si(111)-7x7 surface — *Pingo Mutombo*, PAVEL SHUKRINGOV, MARTIN SVEC, PAVEL JELÍNEK, and VLADIMÍR ČRAB — Institute of Physics, ASCR, v.v.i., Cukrovarnická 10, 10253 Prague 6, Czech republic

DFT calculations performed to determine the adsorption site of a Ta atom at a Si(111)-7x7 surface indicate that it favored the hollow site. Simulated STM images are dominated by a strong electronic effect.

TUEP.SUR.46 16:30

Nernst–Ettlinger effect in layered conductors — *Olga Kirichenko*, OLGA GOLDNOVA, RAZA HASAN, BARANICA KRSTOVSKA, and VALENTIN PESCHANSKY 1 1Faculty of Natural Sciences and Mathematics, Physical Institute, P.O.Box 162, 1000, Skopje, Republic of Macedonia, 2Budapest University, West Bank, Autonomy of Palestine — 3J.E.Verkin Institute for Low Temperature Physics and Engineering, National Academy of Sciences of Ukraine, 47 Lenin ave, Kharkov, 61103, Ukraine

Investigations of Nernst–Ettlingerhausen effect in layered conductors with multilayered Fermi surface at different orientations of a quantizing magnetic field allows to determine electron energy spectrum and contributions to electron transport of different groups of carriers.

TUEP.SUR.47 16:30

Localized vs Charge-Transfer Excited States of Alizarin, Catechol and Polyacene Derivatives Adsorbed on TiO2 as Photosensitizers — AGNIYSSA NAJKROCKA 1, AGATA ZYRTI 1 1Institute of Physics, Maria Curie-Skłodowska University, 20-031 Lublin, Poland — 2Institute of Physics, Lublin Polytechnic, 20-618 Lublin, Poland

Electroabsorption measurements for dyes adsorbed on TiO2 nanoparticles are reported. They provide molecular dipole moment changes on excitation - a direct measure of electron delocalization into the solid. The involvement of charge-transfer states is assessed.

TUEP.SUR.48 16:30

Effect of magnetic field on optical anisotropy in strained CdZnSe/ZnSe Quantum Dots — SHEETAL KAPOOR, JITENDRA KUMAR, and BHANU K SEN — Shri G. S. Institute of Technology & Science, 23 Park road, Indore-450023, India

Electronic and optical properties of ZnCdSe quantum dots is investigated using the Luttinger Hamiltonian formulation. The magnetic field dependence of energy eigenvalues and degree of anisotropy in strained CdZnSe/ZnSe quantum dots is investigated using the Luttinger Hamiltonian formulation. The magnetic field dependence of energy eigenvalues and degree of anisotropy in strained CdZnSe/ZnSe single valley system.

TUEP.SUR.49 16:30

Electron-electron scattering effect on spin-relaxation in many-valley semiconducotor heterostructures — *Mikhail GLAZOV* and EUGENIE IVCHENKO — A.F. Ioffe Physico-Technical Institute, RAS, 194021 St-Petersburg, Russia

Dyakonov-Perel’ spin relaxation mechanism is studied theoretically in a two valley quantum well. Electron-electron scattering rates governing this process are found to be different from those in a single valley system.

TUEP.SUR.50 16:30

Conductance eigenchannels, a case study: Pt atomic chains with impurities — *Alessandra Smogunov* 1,2,3, GABRIELE SCLAUESSER 1,4, ANDREA DAL CORSO 1,4, and ERICO TORRATTI 1,2 1International Centre for Theoretical Physics (ICTP), Strada Costiera 11, 34014 Trieste (Italy) — 2Democritos-INFM, Unità di Trieste, Via Beirut 2/4, 34014 Trieste (Italy) — 3Voronezh State University, University Sq. 1, 394066 Voroněž (Russia) — 4International School for Advanced Studies (SISSA), Via Beirut 2/4, 34014 Trieste (Italy)

The analysis of ballistic transport in terms of conductance eigenchannels is implemented in the plane-wave code PWCOND and will be illustrated on the example of a Pt monatomic nanowire with various kinds of impurities.

TUEP.SUR.51 16:30

Thermal orientation of electron spins in nanostructures — *Sergey Tarasenko* A.F. Ioffe Physico-Technical Institute, 194021 St.Petersburg, Russia

It is shown that the spin orientation of free electrons occurs in low-symmetry semiconductor structures as soon as the electron gas is simply driven out of thermal equilibrium with the crystal lattice.

TUEP.SUR.52 16:30

Exact Numerical Calculation of the Electron Transmission Amplitude of a Correlated Quantum Dot: Few-particle vs. Mean-field regime — ANDREA BERTONI 1 and GIUGIO GOLDNOVA 2,3,4 — INFM-CNRS S1 National Research Center, Modena, Italy — 2Dipartimento di Fisica, Università di Modena e Reggio Emilia, Modena, Italy

The scattering amplitude of a model quantum dot containing few interacting electrons is calculated by using the ‘few-particle quantum transmitting boundary method’. Fano resonances are found, where the transmission phase shows discontinuities.

TUEP.SUR.53 16:30

Microwave Assisted Tunneling through a Single Impurity in Si nanoMOSFET — *Enrico Prati*, ROSSELLA LATESPA, and MARCO FANCHIOLI — Laboratorio Nazionale MDM, CNR-INFM, via Olivetti 2 - 20041 Agrate Brianza - Italy

Photon assisted tunneling up to 40 GHz at 300 mK through a single As impurity in a nanoflash MOSFET is reported. Microwave power effects are observed as different conduction regimes and through excited states.

TUEP.SUR.54 16:30

Splitting of composite vortices due to boundary effects in mesoscopic two-gap superconductors — *Liviu Chibotaru* and *Vu Hung Dao* — Division of Quantum and Physical Chemistry and INPAC, University of Leuven, Leuven, Belgium

In mesoscopic two-gap superconductors with sizes of the order of the coherence length noncomposite vortices are found to be thermodynamically stable in a large domain of the T- H phase diagram.

TUEP.SUR.55 16:30

Destruction of global coherence by long range modifications of disorder in superconducting nanocylinders — *Vu Hung Dao* and *Liviu Chibotaru* — Division of Quantum and Physical Chemistry and INPAC, University of Leuven, Leuven, Belgium

In long superconducting nanocylinders the long-range modulation of the disorder is found to be responsible for the anomalous broadening and the multistep character of the resistive transition between normal and superconducting states in magnetic field.

TUEP.SUR.56 16:30

Bulk and surface waves in a 2D model of anisotropic crystal — *Darbuz TWAROG*, DOMINIK TRZUPEK 1, and PIOTR ZIELinski 1,2 1The H.Niewodniczański Institute of Nuclear Physics PAN, ul. Radzikowskiego 152, 31-342 Kraków, Poland — 2Cracow Technical University, Institute of Physic, ul. Reymonta 4, 30-059 Kraków, Poland

Model of polar anisotropy in external field is shown to exhibit complete stop acoustic band. Surface waves within bulk bands occur in it at specific surface parameters.
Symmetry breaking effect in the ferrocene electronic structure by hydrocarbon monosubstitution: an experimental and theoretical study — Alice Bocchia, Andrea Giacomino Marrani, Stefano Stranges, Robertino Zanoni, Michele Alagia, Mauro Cossi, and Maria Francesca Iozzi.

We use a combined Quantum Monte Carlo, Direct Diagonalization and Tight-Binding approach to study the stability and optical signatures of excitons, trions, and bi-exciton in carbon nanotubes of arbitrary chirality and diameter.

We consider the dynamics of two mesoscopic cavities coupled in series by an edge state. We study the nonlinear response to periodic modulations, in particular the possibility of charge detection and joint interference effects.


We propose a closed formula for the shape of Coster-Kronig preceded Auger transitions covering the whole range between weak and strong correlations. The spectra are computed within an Anderson-like model evaluating a three-body Green’s function.

Dimensional dependence of self-trapping transition of acoustic polarons — Junhua Hou and Xiaxiang Li.

The dependence of the self-trapping of acoustic polarons on the dimensionality is analyzed by a criterion. The results show that the self-trapping of acoustic polarons is more easily to be observed in lower dimensionalities.

Periodic nanostructure in conducting polymer polyaniline — Boris Mirnov, Sergei Asryan, and Sergei Chekalin.

A photoelectron image of a fragment of polyaniline has been obtained with the aid of laser photoelectron projection microscopy. The periodic nanostructure with a period of about 5 nm have been observed.

We consider the charge deep level transient spectroscopy was applied to test a recharging of nanocrystals in a dielectric matrix and to extract information about the quantum confinement levels, the nanocrystal size and concentration.
Aula Amaldi 9:00 – 11:00
WED1A: Semiconductor Physics - Quantum Effects in Low-Dimensional Systems
Chair: T. Ihn, ETH Zurich, Zurich, Switzerland

WED1A1 (Invited) 9:00
An Electron Molecule in a Quantum Dot: Theory and Inelastic Light Scattering Experiments
- Massimo Rontani - CNR-INFM Research Center S3, Modena, Italy
We report the emergence of roto-vibrational modes of a molecular state of correlated electrons in a quantum dot. This relies on a joint experimental and theoretical investigation of the neutral excitations of the electrons.

WED1A2 9:40
Microwave induced magnetism in isolated quantum dots.
- Alexander Chiepialkaski, Sophie Gruen, Helene Bouclat, Frederic Pierre, Ulf Gennser, Antonella Cavanna, Universite Paris-Sud, CNRS, 91405 Orsay, France
- LPN-CNRS, route de Nozay, 91460 Marcoussis, France
We investigate experimentally the interaction between a Bunimovich billiard under microwave irradiation and a high mobility Hall bar set up. Our results suggest that strong magnetic fields up to several Gauss can be created near the stadium.

WED1A3 10:00
Experimental Test of the Dynamical Coulomb Blockade Theory for Short Coherent Conductors
- Carlos Altimiras, Helene Le Sueur, Ulf Gennser, Antonella Cavanna, Dominique Mailly, and Frederic Pierre - Laboratoire de Photonique et de Nanostructures, (LPN)-CNRS, Marcoussis, France
By measuring the Coulomb corrections on the re-

Aula Amaldi 9:00 – 11:00
WED1B: Materials - Pairing Symmetry and Lattice Effects in Superconductors
Chair: A. Bussmann-Holder, Max-Planck-Institut, Stuttgart, Germany

WED1B1 (Invited) 9:00
Supramolecular plastics and self-healing rubbers
- Ludwik Leibler - Matiere Molle et Chimie, ESPCI, UMR 7167, Paris, France
- We will discuss how to harness small molecules to exhibit polymer-like properties thanks to directional interactions and supramolecular chemistry. We show that thus obtained supramolecular rubbers can show amazing self-healing properties.

WED1B2 9:40
Admixture of an s-wave component to the d-wave gap symmetry in high-temperature superconductors
- Albert Furrer - Laboratory for Neutron Scattering, ETH Zurich & PSI Villigen, CH-5232 Villigen PSI, Switzerland
The relaxation behavior of crystal-field transitions in rare-earth based high-temperature superconductors is studied by neutron crystal-field spectroscopy. The data analysis is consistent with a mixed gap function of d-wave (75%) and s-wave (25%) symmetry.

WED1B3 10:00
Universal observation of multipole order parameters in cuprate superconductors
- Ruslan KhSANOV - Alexander ShENGELAY, Alexander MArSBAUDEZ, Daniele DI Castro, Simon S. STREBEL, Fabio La Mattina, Janusz KarpiNSKI, Nikola ZHIGALO, Takahiko MASUY, Shin'ichi MIYASA, Setsuko TAJIMA, Annette BUSSMANN-HOLDER, Hugo KELLER, and Karl Alex MULLER - Laboratory for Muon Spin...
Ferromagnetic GaN by rare earth implantation — •Andreas Wüeck — Lehrstuhl für Angewandte Festkörperphysik, Ruhr-Universität Bochum, D-44780 Bochum, Germany
In the two-dimensional electron gas of GaN heterostructures, focussed Gd ion beams are implanted to a concentration of 1016 cm⁻³. The GaN:Gd becomes ferromagnetic, maintaining its electronic conduction. At T=4.2K, extraordinary Hall effect is observed.

Magnetic excitations and feedback resonances in anisotropic superconductors — •Peter Thalmeier¹, Jun Chang², Ilva Eremkin², David Parker³, and Peter Fulde¹
Max Planck Institute for Chemical Physics of Solids, 01187 Dresden, Germany — Max Planck Institute for the Physics of Complex Systems, 01187 Dresden
Superconducting feedback effect on magnetic excitations in unconventional heavy fermion superconductors UPd₂Al₃, CeCoIn₅ and CeCu₂Si₂ leads to resonance formation in inelastic neutron scattering. Enhancement of Tc in (Pr,La) skutterudite superconductor is due to quadrupolar excitations.

Gap anisotropy in CaC₆: evidence from directional point-contact Andreev-reflection spectroscopy — •Mauro Tortello¹, Renato S. Gonnelli¹, Dario Daghero¹, Debora Deulaud³, Giovanni A. Ummarino¹, Valeri A. Stepanov², Jun Sung Kim³, Reinhard K. Kremer³, Antonio Sanna³, and Sandro Massidda² — Dipartimento di Fisica and CNISM, Politecnico di Torino, C.so Duca degli Abruzzi 24, 10129 Torino, Italy — ²P.N. Lebedev Institute for the Physics of Complex Systems, 01187 Dresden, Germany — ³Institute for the Physics of Complex Systems, 01187 Dresden, Germany
We show simulations and experiments revealing the universal correlation of the structural relaxation time and the vibrational amplitude when the former increases from a few picoseconds to thousands of seconds through the glass transition.

Thermodynamic signature of growing amorphous order in glass-forming liquids — Giulio Biboli¹, Jean-Philippe Boucaud², Andrea Cavagna³, Tommaso Grigera¹, and Paolo Verrocchio¹
— Dipartimento di Fisica and CNISM, Politecnico di Torino, C.so Duca degli Abruzzi 24, 10129 Torino, Italy — ²P.N. Lebedev Institute for the Physics of Complex Systems, 01187 Dresden, Germany — ³Institute of Physics, University of Pisa, Largo B. Pontecorvo 3, 56127 Pisa, Italy — ³Centre for Statistical Mechan...
A magnetization reorientation transition has been observed in Fe$_{81}$Ni$_{19}$/Co superlattices. Our calculations identify it as being due to the competition between in-plane interface and bulk out-of-plane anisotropies, the latter being caused by tetragonal distortions.

Quantum computers could revolutionize information technology, and electron spins in semiconductor quantum dots (QDs) are preferred quantum information carriers. I will show how quantum logic gates can be built in a range of QD systems.

The temperature dependence of superfluid density was determined for three cuprate families. The results disclose generic trends for HTS's, namely the $s+ d$-wave gap in CuO$_2$ planes and $s$-wave gap along the c-axis.

Unconventional oxygen-isotope effects in cuprate superconductors on various quantities, including the transition temperature, the gap, the penetration depth, the pseudogap temperature, the antiferromagnetic transition temperature, and the spin-glass freezing temperature, are presented.

What do NMR data tell us about the symmetries of pairing and spin fluctuations in cuprates? — Peter F. Meier — Physik-Institut der Universität Zürich, Winterthurerstrasse 190, Ch-8057 Zürich, Switzerland

Unconventional isotope effects in cuprate superconductors — Hugo Keller — Physik-Institut der Universität Zürich, Winterthurerstrasse 190, Ch-8057 Zürich, Switzerland

Unconventional oxygen-isotope effects in cuprate superconductors on various quantities, including the transition temperature, the gap, the penetration depth, the pseudogap temperature, the antiferromagnetic transition temperature, and the spin-glass freezing temperature, are presented.

The temperature dependence of superfluid density was determined for three cuprate families. The results disclose generic trends for HTS's, namely the $s+ d$-wave gap in CuO$_2$ planes and $s$-wave gap along the c-axis.
The origin of ferromagnetism in the Co-doped TiO2 semiconductor has been clarified by performing a beyond DFT study of Co interstitials, oxygen vacancies (VO), Co-VO complexes, and complexes formed by Co and atomic H.

Physical Institute, Russian Academy of Sciences, 119991 Moscow, Russia — 3Max-Planck-Institut für Festkörperforschung, D-70569 Stuttgart, Germany — 4Institut für Theoretische Physik, Freie Universität Berlin, D-14195 Berlin, Germany — 5SLACS-INFM/CNR and Dipartimento di Fisica, Università degli Studi di Cagliari, 09042 Cagliari.

We present the first experimental evidence of gap anisotropy in the novel superconductor CaCu3, obtained by means of point-contact Andreev-reflection spectroscopy. Results are in good agreement with theoretical curves calculated from first principles.

Uniaxial anisotropy and temperature driven magnetization reversal of Fe deposited on a MnAs/GaAs(001) magnetic template. — Massimiliano Marangolo1, Sacchi Maurizio2,3, Berthweiser Romain1,2, Spezzani Carlo1, Milano Julian2, Etgens Victor1, Luning Jan2, Jaquen Nicolas3, and Coelio Laetitia4 — 4NSP, Université Pierre et Marie Curie, Paris, France. — 2Laboratoire de Chimie Physique - Matière et Rayonnement, UPMC - Univ.Paris 6, Paris, France. — 3Synchrotron SOLEIL, Paris, France. — 4Sincrotrone Trieste S.C.p.A, Trieste, Italy. — 5Centro Atómico Bariloche and Instituto Balseiro CNEA, Bariloche, Argentina. — 6Universidade Federal de Minas Gerais, Minas Gerais, Brazil.

MnAs/GaAs (001) presents ordered stripes alternating ferromagnetic/paramagnetic micrometric domains (10°C and 40°C). Iron grown above this structures presents a complex ferro/antiferro magnetic texture. We present some unexpected effects of lithium doping on the gaps of MgB2, as evidenced by point-contact Andreev-reflection measurements. The results are discussed within the two-band Eliashberg theory for superconductivity.

X-ray scattering with angle and energy resolution and electronic excitations in transition-metal magnetic ions and elemental transition metals. — Ivan Marrò1, Carlo Maria Bertoni1, and Paolo Ferrabini2 — 1INFN-CNRS, National Research Center on nanoStructures and bioSystems at Surfaces S3, CNISM - Consorzio Nazionale Interuniversitario per le Scienze Fisiche della Materia and Dipartimento di Fisica della Materia and Dipar-
We investigate theoretically facilitated protein diffusion along coiled DNA and suggest a mechanism of DNA-protein electrostatic recognition based on charge complementarity on their surfaces. We analyze electrostatic potential distribution on DNA-protein complexes using PDB data.
We present angle- and polarization-resolved RIXS for Ni and compounds, calculated with different methods: a) single-ion many-electron model, b) one-electron multiple-scattering approach, c) de- tailed band-calculations. We confirm the possibility to observe a crucial anisotropy.

Magnetic anisotropy of single atoms and clusters of Fe and Co on Pt(111) — Timofey Balashov1, Tobias Schuh1, Albert F. Takács1, Sergey Ostadin2, Arthur Ernst1, Jürgen Henk1, Toshio Miyamachi3, Shigemasa Sug3, and Wulf Wulfhekel1 —

1Physikalisches Institut, Universität Karlsruhe, Wolfgang-Gaede-Str. 1, 76131, Karlsruhe, Germany — 2Max-Planck-Institut für Mikrostrukturphysik, Weinberg 2, 06120 Halle, Germany — 3Graduate School of Engineering Science, Osaka University, Toyonaka, Osaka 560-8531, Japan

Magnetic anisotropy of individual Fe and Co atoms, as well as dimers and trimers on a Pt(111) surface was investigated using inelastic scanning tunneling spectroscopy. The results are compared to theoretical calculations.

WED2F3.2 11:50
High resolution imaging of domain walls and vortex cores in ferromagnetic nanomaterials — Mathia Klaui1, Olivier Boulle2, Johannes Klimli1, Ulrich Rüdiger1, and Giancarlo Faini2 —

1Fachbereich Physik, Universität Konstanz, 78457 Konstanz, Germany — 2LPN-CNRS, Marcoussis, France

We obtain high-resolution images of the spin structure of domain walls in in-plane and out-of-plane magnetized samples, which allows us to determine the wall type and the wall width for different structure geometries and materials.

Dissecting the hydrogen bond: a Quantum Monte Carlo approach — Fabio Sterpini1, Leonardo Spanu2, Luca Ferraro3, Sandro Sorella2, and Leonardo Guidoni1 —

1CASPUR, Via dei Tizii 6b, 00185, Roma, Italy — 2International School for Advanced Study (SISSA/ISAS), Via Beirut 4, 34014 Trieste, Italy — 3Department of Chemistry, University of California, Davis 95616 USA — 4Dipartimento di Fisica, La Sapienza - Università di Roma, P.le A. Moro 2, 00185 Roma, Italy

We present angle- and polarization-resolved RIXS for Ni and compounds, calculated with different methods: a) single-ion many-electron model, b) one-electron multiple-scattering approach, c) detailed band-calculations. We confirm the possibility to observe a crucial anisotropy.

Multi-photon Transitions in the System of Coupled Superconducting Flux Quibits — Sergey Shevchenko1, Simon van der Plouw2, Miroslav Grajcar2,3, Evgeniy Luchacz2, Alexandre Omylanchouk1, and Hans-Georg Meyer2 —

1B. Verkin Institute for Low Temperature Physics and Engineering, 47 Lenin Ave., 61103, Kharkov, Ukraine — 2Institute of Photonic Technology, P.O. Box 100239, D-07702 Jena, Germany — 3Department of Experimental Physics, Comenius University, SK-84248 Bratislava, Slovakia

The multi-photon resonant excitations in both single and two coupled flux quibits are investigated. In particular, we discuss the spectroscopy measurements, Landau-Zener interferometry, and the multiphoton fringes in the system.

Fully Frustrated Josephson Junction Arrays With Non Trivial Geometry As Topologically Protected Quibits — Gerardo Cristofano1, Vincenzo Marotta1,2, Adele Naddeo3, and Giuliano Niccoli4 —

1Dipartimento di Scienze Fisiche, Università di Napoli “Federico II” and Istituto Nazionale di Fisica Nucleare, Sezione di Napoli, C. U. Monte-S. Angelo, Via Cintia, IT-80126 Napoli, Italy — 2Dipartimento di Scienze Fisiche, Università di Napoli “Federico II” and Istituto Nazionale di Fisica Nucleare, the cracks, the fracture can be explained in terms of thermally activated fracture.

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Fully Frustrated Josephson Junction Arrays With Non Trivial Geometry As Topologically Protected Quibits — Gerardo Cristofano1, Vincenzo Marotta1,2, Adele Naddeo3, and Giuliano Niccoli4 —

1Dipartimento di Scienze Fisiche, Università di Napoli “Federico II” and Istituto Nazionale di Fisica Nucleare, Sezione di Napoli, C. U. Monte-S. Angelo, Via Cintia, IT-80126 Napoli, Italy — 2Dipartimento di Scienze Fisiche, Università di Napoli “Federico II” and Istituto Nazionale di Fisica Nucleare,
**Wednesday 27 August 2008**

**WED2M.3 12:10**

One-Dimensionally Ordered Metal Nanodot Arrays on Carburized W(110) —
- Magdalená Bachmann, Martin Gabl, Norbert Memmel, and Erminald Berteil — Institute of Physical Chemistry, University of Innsbruck, A-6020 Innsbruck, Austria

One-dimensionally ordered Ag and Co nanodot arrays with extremely narrow size distribution are grown on a (15x12)C/W(110) template. Differences between these metals are discussed and cluster-cluster interactions analyzed on the basis of the 1D-ising model.

**WED2A.2 12:10**

Semiconductor injection lasers in quasi-periodic resonators — Lukas Mahler¹, Alessandro Tredicucci², Fabio Beltram¹, Diederik Wiersma², Berend Witteveen³, Christoph Walther³, Jerome Faist⁴, Harvey Beere⁵, and David Ritchie⁴ — ¹NEST-INFM and Scuola Normale Superiore, Piazza dei Cavalieri 7, I-56126 Pisa, Italy — ²European Laboratory for Nonlinear Spectroscopy, INFM-BEC, I-50019 Sesto Fiorentino, Italy — ³Integrated Systems Laboratory, ETH Zürich, CH-8093 Zürich, Switzerland — ⁴Quantum Optoelectronics Group, Institute for Quantum Electronics, ETH Zürich, CH-8093 Zürich, Switzerland — ⁵Cavendish Laboratory, University of Cambridge, J J Thomson Avenue, Cambridge CB3 0HE, United Kingdom

A one-dimensional Fibonacci sequence is used to provide distributed feedback for a semiconductor laser at Terahertz frequencies. Lasing on both band-edges of the optical pseudo-gap is demonstrated.

**WED2C.2 12:10**

Chain Conformations and Ionization of Annealed Polyelectrolytes Studied by a Combination of Molecular Dynamics and Monte Carlo Simulations — Peter Kosovan, Zuzana Limpouchova, and Karel Prochazka — Department of Physical and Macromolecular Chemistry, Faculty of Science, Charles University in Prague, Albertov 6, CZ-12843 Prague 2, Czech Republic

Water is generally poor solvent for annealed polyelectrolytes. The conformational transition, they undergo with increasing ionization, has been little studied in comparison with quenched polyelectrolytes. We addressed the conformational changes using computer simulations.

**WED2F1.2 12:10**

Nano-crystalline grain growth: A Monte Carlo Potts model approach — Dana Zoller and Peter Streitenberger — Otto-von-Guericke-Universität Magdeburg, Universitätstrasse 2, D-39106, Magdeburg, Germany

Nano-crystalline grain growth is modelled using a modified Monte Carlo Potts model. We assume that the grain boundary mobility is limited at small grain sizes. The simulated growth kinetics is in agreement with experimental results.

**WED2M.4 12:30**

Atomic pathways during the manipulation of single atoms at semiconductor surfaces using FM-AFM — Pavel Jelinek², Pablo Pou², Yoshiaki Sugimoto³, Masayuki Abe³, Oscar Custance², Seizo Morita³, and Ruben Perez² — ²Institute of Physics of the ASCR, Cukrowicka 10, CZ-102 00 Prague, Czech Republic — ³Graduate School of Engineering, Osaka University, Japan

We have combined precise experimental data with an extensive set of first principles DFT simulations in order to identify the atomistic processes involved in the single-atom manipulation.

**WED2A.3 12:30**

Laser emission at 730 and 950 GHz from quantum cascade structures with magnetically assisted gain — Giacomo Scalari², Christoph Walther³, Milan Fischer¹, Harvey Beere⁴, David Ritchie⁵, and Jerome Faist⁴ — ¹Institute of Quantum Electronics, Swiss Federal Institute of Technology Zürich, Zürich, Switzerland — ²Cavendish Laboratory, University of Cambridge, Cambridge, UK

Laser emission at 950 GHz and 730 GHz is demonstrated from quantum heterostructures grown in the AlGaAs/GaAs material system which rely on magnetically enhanced gain to reach laser threshold.

**WED2C.3 12:30**

Skin color modeling using the radiative transfer equation and the inverse problem — Caroline Magnain, Mady Elias, and Jean-Marie Frigerio — Institut des NanoSciences de Paris, UMR CNRS 7588, Université Pierre et Marie Curie, Paris, France

The skin color is modeled thanks to the radiative transfer equation. The parameters responsible for the diversity of skin color are determined and then evaluated from experimental spectra.

**WED2F1.3 12:30**

Unified description of uniaxial ferroelectrics from low temperatures to critical point at presence of strain coupling — Mirosław Galakza¹, Piotr Zielinski¹,², Przemyslaw Sk łarz³, and Grażyna Bator³ — ¹The H. Niewodniczanski Institute of Nuclear Physics PAN, Kraków, Poland — ²Cracow University of Technology, Institute of Physics, Kraków, Poland — ³Faculty of Chemistry University of Wroclaw, Wroclaw, Poland

Equations of state compatible with scaling hypothesis at critical point and with order parameter saturation at low temperatures are constructed for uniaxial ferroelectrics and compared with experiment.
We propose a QMC approach based on a Valence Bond representation to dissect hydrogen bond intermolecular interactions into their elementary terms such as dispersion and covalent energy. The method is applied to the water dimer.
12:50 – 14:30: Lunch Break

14:30 – 16:20
EPS14.1: 14th General Conference of the European Physical Society - Part I
Chair: Albert Fert, UMP CNRS/Thales, Palaiseau, France

EPS14.1.1 (Plenary) 14:50
Graphene: Magic of Carbon Flatland
— Andre Geim and Kostya Novoselov —
Manchester Centre for Mesoscale & Nanotechnology, University of Manchester M13 9PL, U.K.
Graphene is a rapidly rising star on the horizon of condensed matter physics, revealing a cornucopia of new phenomena. I will overview our work on graphene concentrating on its next-to-magic properties and speculate about applications.

EPS14.1.2 (Plenary) 15:35
2011 - Odyssey in Nanospace — Helmut Dosch — Max Planck Institute for Metals Research, Heisenbergstr. 3, 70569 Stuttgart, Germany
In this lecture I discuss the future challenges and breakthroughs in Nanoscience and Nanotechnologies by the use of European Megafacilities.

16:20 – 17:00: Coffee Break

17:00 – 18:35
EPS14.2: 14th General Conference of the European Physical Society - Part II
Chair: Klaus Wandelt, University of Bonn, Bonn, Germany

EPS14.2.1 (Plenary) 17:00
News from Quantum Hall Physics
— Klaus von Klitzing — Max Planck Institute for Solid State Research, Stuttgart, Germany
Every day a new QHE paper is published. The talk summarizes the applications of this effect in metrology and the most recent basic research on coupled QHE devices which show properties of exciton condensation and superfluidity.

18:35 – 20:00: Reception
THUPL: Plenary 3

Chair: Giorgio Parisi, University La Sapienza, Roma, Italy

THUPL.1 (Plenary) 8:45
Condensed matter physics with light and atoms: ultra-cold fermions in optical lattices. — Antoine Georges — Ecole Polytechnique and CNRS, Palaiseau, France

A new form of condensed matter physics is emerging from the study of ultra-cold fermionic atoms in optical lattices. I will review some recent achievements and future challenges in this field.

THU1M: Surface, Interface and Low-Dimensional Physics - Electronic Properties III

Chair: Daniel Malterre, Université Henri Poincaré, Nancy, France

THU1A: Semiconductor Physics - Quantum Transport

Chair: G. Grosso, Università di Pisa, Italy

THU1C: Joint Biological Physics & Life Sciences and Polymer Physics VIII

Chair: Hans Riegler, MPIKG, Potsdam, Germany

THU1F1: Materials - Carbon Nanotubes

Chair: T. Pichler, University of Wien, Wien, Austria

THU1M.1 (Invited) 9:40
One-Dimensional Physics on Surfaces: Charge Density Waves, Fluctuations, and Phase Transitions — Erminald Bertel, Alexander Menzel, and Enrico Donà — Institute of Physical Chemistry, University of Innsbruck, Innsbruck, Austria

Phase diagram and electronic properties of adsorbate/Pt(110) surfaces are explored using variable-temperature STM, angle-resolved photoemission and low-energy electron diffraction. Evidence for a Peierls transition, fluctuations and phase separation typical for quasi-1D correlated systems is found.

THU1A.1 (Invited) 9:40
Electronic transport in quantum dots: from GaAs to graphene — Thomas Ihn, Simon Gustavsson, Thomas Müller, Stephan Schnez, Johannes Güttinger, Françoise Molitor, Christoph Stampaeff, and Klaus Ensslin — Solid State Physics Laboratory, ETH Zurich, Schafmattstrasse 16, 8093 Zurich, Switzerland

Experiments on quantum dots will be reviewed in which a capacitively coupled quantum point contact is used as a charge detector. This technique is applied for studying quantum dots in GaAs and in graphene.

THU1C.1 (Invited) 9:40
Directed Self-Oriented Self-Assembly of Block Copolymers: Bottom-Up Meeting Top-Down — Thomas Russell — Department of Polymer Science and Engineering University of Massachusetts

By combining directed self-orienting self-assembly of block copolymers, the bottom-up approach, with micro-fabrication processes, the top-down approach, faster, better and cheaper devices can be generated in very simple, yet robust, ways.

THU1F1.1 9:40
Towards a Controlled Assembly of Molecular Chains: Functionalized Fullerenes inside Carbon Nanotubes — Rudolf Pfeiffer1, Thomas W. Chamberlain2, Herwig Peterlik1, Hans Kuzmany1, Christian Krämer1,2, Ferenc Simon3, Francesco Zerbetto1, Manuel Melle-Franco1, Luke Staddon2, Neil R. Champness2, G. Andrew D. Briggs4, and Andrei N. Khlobystov2 — 1Faculty of Physics, University of Vienna, Austria — 2School of Chemistry, University of Nottingham, Nottingham NG7 2RD, UK — 3Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany — 4TU Budapest, Hungary — 5Dipartimento di Chimica, Università di Bologna, V. F. Selmi 2, 40126 Bologna, Italy — 6Department of Materials, University of Oxford, Oxford OX1 3PH, UK

SWCNTs were filled with alkyl- and aryl-functionalized fullerenes. By changing the attached sidegroups we can engineer the distance between the encapsulated fullerenes, which is important for the production of 1D spin chains.

THU1F1.2 10:00
Electron-electron correlation effects in graphene and graphite — Claudio Attacalite — Universidad del País Vasco, Unidad de Física de Materiales Centro Mixto CSIC-UPV/EHU Centro Jose Mari Korta, Avd, Tolosa 72 E-20018 San Sebastian, SPAIN
THU1F3.1 9:40
Room temperature ferromagnetism in the TiO$_2$ rutile system: The role of oxygen vacancies and transition metal impurities —
Luigi Sangaletti$^1$, Giovanni Drera$^1$, Maria Cristina Mozzati$^2$, Pietro Galinetto$^2$, Yu A. Diaz-Fernandez$^3$, Lorenzo Malavasi$^3$, Adolfo Speghini$^4$, and Marco Bettinelli$^5$ —
$^1$Dipartimento di Matematica e Fisica, Università Cattolica, Via dei Musei 41, 25121, Brescia, Italy — $^2$CNISM and Dipartimento di Fisica "A. Volta", Università di Pavia, Via Bassi 6, 27189, Pavia, Italy — $^3$Dipartimento di Chimica fisica, Università di Pavia, Via Bassi 6, 27100, Pavia, Italy — $^4$DiSTeMeV, Università di Verona and INSTM, UdR Verona, Villa Lebrecht, Via della Pieve 70, 37029 San Floriano, Verona, Italy — $^5$Dipartimento Scientifico e Tecnologico, Università di Verona, Strada Le Grazie 15, 37134 Verona, Italy
The effects of oxygen stoichiometry on the magnetic properties of pure and doped TiO$_2$ rutile are presented. Ferromagnetism is detected already at room temperature and increases with the concentration of oxygen defects.

THU1F3.2 10:00
Magnetism in Sr$_3$Ru$_2$O$_7$/Sr$_4$Ru$_3$O$_{10}$ Eutectic Crystals —
Danilo Zola$^{1,2}$, Rosalba Fittipaldi$^{1,2}$, Massimiliano Polichetti$^{1,2}$, Antonio Vecchione$^{1,2}$, Mario Cuoco$^{1,2}$, Francesco Laviano$^{3}$, Enrica Mezzetti$^{3}$, and Sandro Pace$^{1,2}$ —
$^1$SuperMat CNR-INFN Regional...
Electron-phonon effects on transport and one-particle properties of two-dimensional spin-orbit electron systems — •Emmanuele Cappelluti1,2, Claudio Grimalti3, and Frank Marsiglio4 — 1SMC Research Center, INFN-CNRM CNR c/o Dept. of Physics, University “La Sapienza”, P.le A. Moro 2, 00185 Roma, Italy — 2Istituto dei Sistemi Complessi (ISC), CNR, v. dei *Taurini 19, 00185 Roma, Italy — 3LPM, Ecole Polytechnique Fédérale de Lausanne, Station 17, CH-1015 Lausanne, Switzerland — 4Deutsches Elektronen-Synchrotron, D-15699 Hamburg, Germany

We studied the effect of the electronic correlation on the band structure of graphite and graphene within GW approximation and determine the electron-phonon coupling on various approximations to explain recent Raman and ARPES experiments.

Cylindrical 2DEG in a Magnetic Field: Landau Levels and Aharonov-Bohm Effect — •Giulio Ferrari1, Andrea Bertoni1, Guido Goldoni1,2, and Elisa Molinar1,2 — 1S3 CNR-INFM National Research Center, Via Campi 213/A, 41100 Modena, Italy — 2Dipartimento di Fisica, Università di Modena e Reggio Emilia, Modena, Italy

We compute energy bands, density of states and eigenfunctions of carriers on a cylindrical surface in a magnetic field. Tuning the intensity and the direction of the field, Aharonov-Bohm effect and Landau levels are investigated.

Diffraction Intensities of Double-Wall Carbon Nanotubes: Symmetry Based Characterization — •Tatjana Vukovic and Milan Damjanovic — Faculty of Physics, University of Belgrade, Studentski trg 12-16, P. O. Box 368, Belgrade 11001, Serbia

We present a full symmetry based analysis of diffraction intensities of double-walled carbon nanotubes enabling direct insight into various effects of chirality of its walls, as well as its mutual position, on the intensity distribution.
We discuss the magnetic properties of Sr$_3$Ru$_2$O$_7$/Sr$_3$Ru$_4$O$_{16}$ eutectic crystals where the two phases shape a multilayered structure. The magnetism in these crystals cannot be discussed as superimposition of the magnetic properties of the single phases.

**THU1F3.3**

**Broken Time-Reversal Symmetry in Triplet Superconductor Junctions** — **PHILIP BRYDON**$^1$, **CHRISTIAN ISODITAKIS**$^2$, **DIREK MAENKE**$^3$, and **MANFRED SIGREST**$^2$ — $^1$Max-Planck-Institut für Festkörperforschung, Stuttgart, Germany — $^2$ETH-Zürich, Zürich, Switzerland

We demonstrate that the breaking of time-reversal symmetry in Josephson junctions between triplet superconductors stabilizes a magnetic moment at the junction barrier. The consequences of this novel behaviour are investigated.

**THU1F4.2**

**CuO$_2$ in-plane phonon anomaly in high Tc superconductors: the case of the Oxchlorides** — **MATTEO D’ASTUTO**$^1$, **MATTIA CALANDRA**$^1$, **PAOLA GIURA**$^1$, **IKUYA YAMADA**$^2$, **MORITZ HOERSCHE$^2$, **MICHAEL KRISCH**$^2$, **MASAKI AZUMA**$^3$, **MIKIO TAKANO**$^1$, **ANDREA GAUZZI**$^1$, **FRANCESCO MAURU$^1$, and **ABHAY SHUKLA**$^1$ — $^1$ETH-Zürich, Zürich, Switzerland — $^2$European Synchrotron Radiation Facility, BP 220, F-38043 Grenoble cedex, France — $^3$Institut de Minéralogie et de Physique des Milieux Condensés (IMPMC), Univ. Pierre et Marie Curie Paris 6, 140 rue de Lourmel, 75015 Paris, France

We will present our new measurements and calculations on the phonon dispersion and lifetime in superconducting Cu$_2$-O$_2$Cl$_2$, and discuss the electron-phonon coupling strength in this system and in cuprate.

**THU1F6.3**

**Causality, information flow, and efficient prices in financial markets** — **FABRIZIO LILLO** — Dipartimento di Fisica e Tecnologie Relative, viale delle Scienze, I-90128 Palermo, Italy — Santa Fe Institute, 1399 Hyde Park Road, Santa Fe, NM 87501, USA

We study the community structure of the trading networks of brokers in the Spanish Stock Exchange. We explain the asymmetric causality between order flow and returns in terms of delayed market clearing and market efficiency.
22nd General Conference of the Condensed Matter Division of the European Physical Society - Thursday 28 August 2008

Thursday 28 August 2008

Aula Magna
11:00 – 11:30: Coffee Break

11:30 – 12:50

THU2M: Surface, Interface and Low-Dimensional Physics - Small Particle and Nanowires
Chair: E. Molinari, Università di Modena e Reggio Emilia and CNR-INFM S3, Modena, Italy

From sphere to star: shape dependence of surface plasmons in gold nanoparticles studied by STEM-EELS
• STEFANO MAZZUCCO, ODELE STEPHAN, MATHEU KOCLAK, and CHRISTIAN COLLIEX - Laboratoire de Physique des Solides, Univ. Paris-Sud, CNRS, UMR 8502, F-91405 Orsay Cedex, France

We present experimental nanometer-scale maps showing how morphology affects surface plasmons of gold nanoparticles. Moving from sphere-like to star-like nanoparticles a supplementary sharpness-dependent tip mode arises beside the core plasmon sphere.

Aula Amaldi
11:00 – 11:30: Coffee Break

11:30 – 12:50

THU2A: Semiconductor Physics - Quantum Effects
Chair: Marco Capizzi, Sapienza Università di Roma, Rome, Italy

Self-sustained magnetoelectric oscillations in magnetic double barrier structures
• DIMITRIS VLAISOPoulos1,2, MICHAEL KAPNISTOS1,2, MICHAEL LANG1,5, WIM PYSCHOUT-HIJZEN2, DIETER RICHTER2, DONGHUY CHO2, TAHYUN CRANG2, JACQUES ROOVERS8, and MICHAEL RUBINSTEIN2 - 1Institute of Electronic Structure and Laser, Foundation for Research and Technology Hellas, Heraklion, Crete, Greece - 2Department of Materials Science & Technology, University of Crete, Heraklion, Greece - 3Department of Chemical Engineering, University of California, Santa Barbara, CA, USA - 4Department of Chemistry, University of North Carolina, Chapel Hill, NC, USA - 5Leibniz Institute for Polymer Research, Dresden, Germany - 6Institute of Solid State Research, Forschungszentrum Jülich, Jülich, Germany - 7Department of Chemistry, Pohang University of Science & Technology, Pohang, Korea - 8Institute for Chemical Process & Environmental Technology, National Research Council, Ottawa, Ontario, Canada

We theoretically investigate the highly nonlinear dynamics of a ferromagnetic semiconductor double barrier structure, in which the transport and magnetic properties are strongly coupled. The occurrence of intrinsic self-sustained current and magnetization oscillations is predicted.

Aula Conversi
11:00 – 11:30: Coffee Break

11:30 – 12:50

THU2C: Quantum Transport in Magnetic Fields - Time-Resolved Quantum Effects
Chair: K. Saawächter, Martin-Luther-Universität Halle-Wittenberg, Halle, Germany

Dynamics of cyclic polymers
• DIMITRIS VLAISOPoulos1,2, MICHAEL KAPNISTOS1,2, MICHAEL LANG1,5, WIM PYSCHOUT-HIJZEN2, DIETER RICHTER2, DONGHUY CHO2, TAHYUN CRANG2, JACQUES ROOVERS8, and MICHAEL RUBINSTEIN2 - 1Institute of Electronic Structure and Laser, Foundation for Research and Technology Hellas, Heraklion, Crete, Greece - 2Department of Materials Science & Technology, University of Crete, Heraklion, Greece - 3Department of Chemical Engineering, University of California, Santa Barbara, CA, USA - 4Department of Chemistry, University of North Carolina, Chapel Hill, NC, USA - 5Leibniz Institute for Polymer Research, Dresden, Germany - 6Institute of Solid State Research, Forschungszentrum Jülich, Jülich, Germany - 7Department of Chemistry, Pohang University of Science & Technology, Pohang, Korea - 8Institute for Chemical Process & Environmental Technology, National Research Council, Ottawa, Ontario, Canada

We investigate from first principles the opto-electronic properties of graphene nanoribbons (GNRs) with the inclusion of many-body effects. We show that strong exciton binding is accompanied by relevant effects of edge passivation and width modulation.

Aula 1
11:00 – 11:30: Coffee Break

11:30 – 12:50

THU2F1: Optical Properties of Graphene Nanoribbons - Boron-doped graphene and ab-initio study
• FRANÇOIS VAOURC'H, PIERRRE MALLET, JEAN-YVES VIEULLEN, and LAURENCE MAGAUD - Institut Néel, C.N.R.S. and Université Joseph Fourier, Boîte Postale 166, F-38042 Grenoble Cedex 9, France

STM and ab initio studies allow us to give a description of the graphene/SiC(0001) interface at the atomic scale. We demonstrate the existence of substrate-induced ripples in the graphene monolayer.

THU2F1.1 11:30

Optical properties of graphene nanoribbons
• DEBORAH PREZZI1, DANIELE VAIRANO2, ALICE BUENI2, ANDREA MARINI3, and BRUNA VOLODOMYR DIHAGAN3 - 1INFN-CNR-S3, National Center on NanoStructures and BioSystems at Surfaces, I-41100 Modena, Italy - 2Dipartimento di Fisica, Università di Modena e Reggio Emilia, I-41100 Modena, Italy - 3Dipartimento di Fisica, Università di Roma “Tor Vergata”, I-00133 Roma, Italy

We investigate from first principles the opto-electronic properties of graphene nanoribbons (GNRs) with the inclusion of many-body effects. We show that strong exciton binding is accompanied by relevant effects of edge passivation and width modulation.

THU2F1.2 11:30

Soft ripples in the first graphene layer on SiC(0001) surface: A joint STM and ab-initio study
• FRANÇOIS VAOURC'H, PIERRRE MALLET, JEAN-YVES VIEULLEN, and LAURENCE MAGAUD - Institut Néel, C.N.R.S. and Université Joseph Fourier, Boîte Postale 166, F-38042 Grenoble Cedex 9, France

STM and ab initio studies allow us to give a description of the graphene/SiC(0001) interface at the atomic scale. We demonstrate the existence of substrate-induced ripples in the graphene monolayer.

THU2F1.3 12:10

Even-odd effect in graphene valley filter
• ALESSANDRO CRESTI1, GIUSEPPE GROSSI1, and GIUSEPPE PASTORI PARRAVICINI2 - 1Dipartimento di Fisica, Universita‘ di Pisa, Italy - 2Dipartimento di Fisica, Universita‘ di Pavia, Italy

We analyze the peculiar even-odd dependence of...
Characterization of interactions and switching behavior in particulate magnetic materials by scalar and vector (rotational) first-order reversal curves (FORC) diagrams — D’Addato1, Stoleriu1, Alexandru2, and Andrei3 — 1Department of Physics, Alexandru Ioan Cuza University, Blvd. Carol I, 11, Iasi, Romania — 2Department of Electrical and Computer Engineering, Florida State University and Florida A&M University, Tallahassee, FL, USA

One presents a comparative study of the physical meanings of data extracted from the scalar FORC diagrams and the newly-introduced vector FORC diagram, measured on the rotational hysteresis describing a material’s vector switching properties.

Correlation of structural and magnetic properties of size-selected FeCo alloy nanoparticles on surfaces — Getzlaff1, Spizzo1, Valeri2, and Kleibert3 — 1University of Ulm, D-89069 Ulm, Germany — 2University of Düsseldorf, D-40225 Düsseldorf, Germany — 3Department of Electrical and Computer Engineering, Florida State University and Florida A&M University, Tallahassee, FL, USA

We report an enhancement of Tc in LSCO(x=0.35) /LSCO(x=0.15) with respect to the bare LSCO film. The enhanced transition displays 2D characteristics and is attributed to increased phase stiffness induced by the overdoped layer.

Morphological and magnetic characterization of Ni nanoparticles films — D’Addato1,2, Gragnaniello1,2, Alessandro di Bona1, Alberto Rota1, Sergio Valeri1,2, Franco Ronconi1, and Federico Spizzo1 — 1INFN-CNR, S3 Research Centre, — 2A. F. Ioffe Physico-Technical Institute, 194021 Saint Petersburg, Russia — 3DESY, Hamburgerstrasse 52, D-22607 Hamburg, Germany

The role of the vortex-core energy within the Kosterlitz-Thouless transition — Benfatto1, Castellani2, and Giamarchi2 — 1Dipartimento di Fisica “E.R. Caianiello” and CNISM Unit, Via S. Alfonsina, 400184, Rome, Italy — 2Dipartimento di Fisica “E.R. Caianiello” and CNISM Unit, Via S. Alfonsina, 400184, Rome, Italy

Enhancement of the superconducting transition temperature in LSCO bilayers: Role of pairing and phase stiffness — Yuli1, Avishai2, Leonid Iomin2, Gad Koren2, Oded Millo1, and Dror Orgad1 — 1Racah Institute of Physics, The Hebrew University of Jerusalem, Jerusalem 91904, Israel — 2Department of Physics, Technion — 3Racah Institute of Physics, The Hebrew University of Jerusalem, Jerusalem 91904, Israel

We report an enhancement of Tc in LSCO(x=0.35) /LSCO(x=0.15) with respect to the bare LSCO film. The enhanced transition displays 2D characteristics and is attributed to increased phase stiffness induced by the overdoped layer.
adsorbed CO molecules on monatomic Pt-chains shows that the CO molecules repel each other. This repulsion, caused by electron depletion, gradually fades away within 3-5 nm.

Spin Coulomb Drag — •SAMUEL BADALYAN1,2, CHANG SUB KIM3, and GIOVANNI VIGNALE4 — 1Department of Radiophysics, Yerevan State University, 1 A. Manoukian St., Yerevan, 375025, Armenia — 2Department of Physics, Institute for Theoretical Physics, 93040 Regensburg, Germany — 3Department of Physics, Chonnam National University, Gwangju 500-757, Korea — 4Department of Physics and Astronomy, University of Missouri - Columbia, Missouri 65211, USA

We investigate the spin Coulomb drag (SCD) in a quasi-two-dimensional electron gas beyond the random phase approximation. Our results are in a very good agreement with the experimental findings and verify the observation of SCD.

Chromophore States in Photocromic Green Fluorescent Protein Mutants: a Raman Study — •STEFANO LINI1,2, VALENTINA TOZZINI1,2, MICHELA SERI1,3, and FABIO BELTRAMI1,2,3 — 1Scuola Normale Superiore — 2SISSA, ISIT, Trieste, Italy — 3Max Planck Institute for Theoretical Physics, 93040 Trieste, Italy

We studied the chromophores of and in reversibly switchable fluorescent proteins, starting with the experimental and calculated Raman spectra of their states; these have been distinguished by their different protonation or cis-trans isomerization.

Curved graphene sheets grown at the edges of stacked graphene planes — ISKANDAR KHOLOMANYO1,2, EMANUELE CARAVELLEI1,2, MATTIA FANETTI1,2, CINZIA CEPERI2, and LUCA GAVIOLI1,2 — 1Dipartimento di Matematica e Fisica, Università Cattolica del Sacro Cuore, via dei Musei 41, 25121 Brescia, Italy — 2Laboratorio nazionale TASC INFN-CNRM, Area Science Park, Basovizza S.S. 14 Km 163.5, IT-34012 Trieste, Italy

We fabricate a structurally new form of graphene, namely curved graphene sheets, synthesized by chemical vapor deposition on HOPG. Scanning tunneling microscopy shows that the CGS has grown at the edges of topmost graphene bilayers.

The current-blocking effect in bipolar graphene junctions obtained in zigzag nanoribbons. We present numerical simulations and propose a symmetry-breaking interpretation of the effect.
We present the results of a morphological and magnetic study of Ni nanoparticles ultrathin films. The films grow in random paving mode, with evidence of two regimes: collective blocking ($T < 70$ K) and reversibility ($T > 70$ K).

We investigate the role of the vortex-core energy on the occurrence of non-universal Kosterlitz-Thouless physics in layered anisotropic systems and in 2D systems at finite magnetic fields.

The magnetic properties of oxidized ferromagnetic Co-Ni nanowires have been investigated. The temperature dependence of the coercive and exchange bias fields shows the correlation of exchange bias and superparamagnetic fluctuations of antiferromagnetic CoO grains.

We studied spectra of adjacency matrix and of Laplacian for uncorrelated random network with arbitrary degree distribution, founding minimal degree of the vertex to be most important network's characteristics.

We show that, in contrast with what expected, weighted networks display strong residual structural correlations after randomization. We fully characterize these correlations analytically in terms of Bose statistics. New unbiased weighted definitions are therefore necessary.
THU3M.1 14:40
Chiral purification using Ostwald ripening — •Elias Vlieg1, Wim Noorduin1, Hugo Meekes3, Willem van Enckevort1, Toshiko Izumi1, Hugo Meekes3, and Richard Kellogg3 — 1Badhoud University Nijmegen, The Netherlands — 2Imperial College, London, UK — 3DSM, Gelsen, The Netherlands — 4Syncrom BV, Groninge, The Netherlands
We have found a method based on attrition-enhanced Ostwald ripening to produce crystals of single handedness starting from a mixture of left and right-handed crystals.

THU3A.1 14:40
What is the main factor which determines the extent of N disorder induced in the band structure of III-V dilute nitride semiconductor alloys? — Andrew Lindsay1 and •Eoin O’Reilly2,1 — 1Tyndall National Institute, Lee Maltings, Cork, Ireland — 2Department of Physics, University College Cork, Cork, Ireland
We show that the main factor determining the extent of N-disorder in the conduction band states is the energies of basic key N-clusters and where they lie in relation to the host conduction band edge.

THU3A.2 15:00
Hydrogen behavior in InN — •Giorgio Pettinari1, Antonio Polimeni1, Mario Capezz1, Valmire Lepesde2, Volkert Cimalla2, Oliver Ambacher2, Maria Losurdo3, Giovanni Bruno3, Tong-Ho Kim4, Soojeong Choi4, and April Brown4 — 1CNISM-Dipartimento di Fisica, Sapienza Universita di Roma, P.le A. Moro 2, 00185 Roma, Italy — 2Fraunhofer Institute for Applied Solid State Physics, Tullastr. 72, 79108 Freiburg, Germany — 3Institute of Inorganic Methodologies and of Plasmas, IMP-CNIR, via Orabona 4, 70125 Bari, Italy — 4Electrical and Computer Engineering Department, Duke University, 27708 Durham, NC USA
The effects of hydrogen incorporation in InN are reported. Hydrogen leads to an increase of the carrier concentration by two orders of magnitude and to a dramatic opening of the bandgap by about 0.5eV.

THU3A.3 15:20
Tunable Photonics with Optimally Driven Color Centers in Diamonds — Jin Hui Wu1, Giuseppe La Rocca2, and Maurizio Artoni3 — 1department of physics, jilin university, changchun, china — 2department of chemistry and physics of materials, university of brescia, italy — 3department of physics, university of modena, modena, italy
Inhomogeneously broadened optical transitions of nitrogen-vacancy centers in diamond may be employed to attain all-optically tunable photonic band-gap structures that can be devised to improve light storage efficiencies in solids quantum memory devices.

THU3C.1 14:40
Dynamics of Asymmetric Polymer Blends — •Juan Colmenero1 — Centro de Fisica de Materiales (CSIC-UPV/EHU), Apartado 1072, 20080 San Sebastian, Spain
Miscible polymer blends where the two components have very different time scales for segmental dynamics (dynamic asymmetry) show very peculiar dynamic features. Here we summarize the results obtained by neutron scattering and molecular dynamics simulations.

THU3C.2 15:20
Kinetics of Intramolecular Contact Formation in Disordered Peptides and Unfolded Proteins — •Marco Bisoglia1, Andrea Sabatino, and Tommaso Bellini1 — Dipartimento di Chimica, Biochimica e Biotecnologie per la Medicina, Università degli Studi di Milano, via F.lli Cervi 93, 20090 Segrate (Milano), Italy
Quenching of the triplet state of tryptophan after nanosecond laser excitation is used to probe the rate of intra-chain contact formation in disordered peptides and in the unfolded state of simple proteins.

THU3F1.1 14:40
Selective Ge nano island growth on Ga terminated vicinal silicon surfaces — •Mortiz Speckmann1, Thomas Schmidt2, Torben Clausen1, Jan Ingo Flege2, Peter Sutter4, Andrea Locatelli3, Stefano Heun2, and •Jens Falta3 — University of Bremen, Bremen, Germany — 2Brookhaven National Laboratory, Upton (NY), United States — 3Sincrotrone ELETTRA, Trieste, Italy — 4TASC INFM-CNR, Trieste, Italy
Ga adsorption can be used to tune Ge growth on vicinal silicon surfaces. For Si(113) and Si(112) the impact of growth temperature on the Ge island shape, size and density will be presented.

THU3F1.2 15:00
Non-equilibrium superconducting proximity effect in interacting quantum dots — •Michele Govorovali1, Marco G. Pala2, and Jürgen König1,3 — 1Institut für Theoretische Physik III, Ruhr-Universität Bochum, 44780 Bochum, Germany — 2IMEP-LAHC-MINATEC (UMR CNRS/INPG/UJF 5130), 38016 Grenoble, France — 3Theoristische Physik, Universität Duisburg-Essen, 47045 Duisburg, Germany
We investigate transport through a three-terminal setup, consisting of a quantum dot tunnel coupled to two phase-biased superconducting leads and one voltage-biased normal lead, by means of a real-time diagrammatic theory.
Spin dynamic and magnetic phase transition in quasi two-dimensional Mn[CoH$_6$(O)\(\text{COO})_2\]•2H$_2$O — Konstantin Debachev, Mireiha Kobets, Eugen Kratsko, Vitalii Kirustalev, and Volodymir Pushchenko — Institute for Low temperature Physics 47 Lenin Ave. 31103 kharkov, Ukraine

EPR spectrum and magnetic properties of the antiferromagnet Mn[CoH$_6$(O)\(\text{COO})_2\]•2H$_2$O are studied. Spin relaxation process parameters were found in high temperature limit. The spin-reorientations magnetic phase transitions was studied in pulse magnetic field.

THU3F3.2 15:00

Cubic helimagnets in magnetic field and at pressure — Sergey Maleyev — Petersburg Nuclear Physics Institute, Gatchina, St. Petersburg 188300, Russia

Magneteto-elastic interaction in cubic helimagnets is considered. Lattice deformation, anisotropic energy and negative contribution to spin-wave gap are calculated. Origin of quantum phase transition in MnSi is discussed.

THU3F3.3 15:20

Mechanisms of spin-mixing instabilities in antiferromagnetic molecular wheels — Alessandro Soncini and Liviu Chibotaru — Division of Quantum and Physical Chemistry, University of Leuven, Leuven, Belgium

The microscopic theory of field-induced spin-mixing instabilities in antiferromagnetic molecular wheels, fully accounting for the main experimental features in CsFe$_8$, is proposed. It includes field-dependent permanent and vibronic mixing and phonon interactions.

THU3F3.4 15:20

The Dynamical Vertex Approximation: spatial correlations beyond Dynamical Mean Field Theory — Alessandro Toschi$^1$, Andrea Katnani$^{1,2}$, and Karsten Held$^{1,3}$ — Max Planck Institute for Solid State Physics, Stuttgart, Germany — 2Institute of Metal Physics, Ekaterinburg, Russia — 3Institute for Solid State Physics, Vienna University of Technology, Vienna, Austria

Treating spatial correlations beyond DMFT is at the frontier of condensed-matter research. Our new approach, coined dynamical vertex approximation (DVA), allows for the inclusion of long-range correlations and is, hence, complementary to cluster-DMFT schemes.

THU3F5.6 15:20

Statistical modeling of wind velocity: individual and collective perspective — Saviero Beyona, Giovanni Bonanno, Riccardo Burlon, Davide Gurrera, and Claudio Leone — Dipartimento di Fisica e Tecnologie Relative - Università degli studi di Palermo - Viale delle Scienze - Ed.18 - I-90128 Palermo - Italy

We discuss univariate and multivariate statistical properties of wind velocities recorded at different locations in Sicily. We show that tools of complex systems can be used to reproduce properties of the investigated time series.
Liquid water-Au(111) interface: Insights by classical molecular dynamics simulations. — 1STEFANO CORN1, ARREGIO CALZOLARI1, ALESSANDRA CATELLANI1, and FRANCESCO IORI1 — 1CNR-IFM S3 National Research Center on nanoStructures and bioSystems at Surfaces, IT- 41100 Modena, Italy — 2CNR-IMEM Istituto dei Materiali per l’Elettronica ed il Magnetismo, IT- 43010 Parma, Italy — 3Dept. of Physics, University of Modena and Reggio Emilia, IT- 41100 Modena, Italy

The water - Au(111) interface is fundamental for several phenomena, including protein-surface interactions mediated by water. We performed classical molecular dynamics simulations of this system, analyzing gold wettability in terms of the surface water structure.

Detection of near to mid infrared light with an organic/inorganic hybrid hetero-junction — 1GERHARD MATT1, THOMAS FROMHERZ1, CHRISTOPH LUNGENSCHMID1, GUILLAUME GONCALVES2, MATTEO BEDNOREK2, SAIED ZAMIRI2, SERBAS NIAYAZ SARICICHTI1, and GÜNTHER BAUER2 — 1Linz Institute for Organic Solar Cells (LIOS), Johannes Kepler University, Austria — 2Institute for Semiconductor and Solid State Physics, Johannes Kepler University, Austria

Here we report on a novel IR light sensing device (1.1-3 µm) based on a silicon/fullerene hetero-junction. It will be shown that the nature of the interface causes the IR photo-current.

Optical Conductivity of Polaron: Analytic Approaches — 1JOSEF T. DEVREESTE1 and SERGIUS N. KLININ1 — 1Theoretische Fysica van de Vaste Stoffen (TFVS), Universiteit Antwerpen, B-2020 Antwerpen, Belgium

Recent optical measurements of perovskite materials stimulate a new interest to polarons. We have derived an analytically exact in the strong-coupling limit polaron optical conductivity, which is in a good agreement with Monte Carlo results.

Detection of near to mid infrared light with an organic/inorganic hybrid hetero-junction — 1GERHARD MATT1, THOMAS FROMHERZ1, CHRISTOPH LUNGENSCHMID1, GUILLAUME GONCALVES2, MATTEO BEDNOREK2, SAIED ZAMIRI2, SERBAS NIAYAZ SARICICHTI1, and GÜNTHER BAUER2 — 1Linz Institute for Organic Solar Cells (LIOS), Johannes Kepler University, Austria — 2Institute for Semiconductor and Solid State Physics, Johannes Kepler University, Austria

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Molecular visualization of polymer crystal growth — 1WENBING HU1 — 1School of Chemistry and Chemical Engineering, Nanjing University, Nanjing, China

We report molecular simulations of polymer crystal growth exhibiting molecular segregation, regime transitions, self-poisoning, and co-crystallization of binary mixtures of different chain lengths, which provide us more insights into the kinetics of polymer crystal growth.

Spin-orbit Induced Triplet-singlet Relaxation of Multielectron Spin States in Cylindrical Quantum Dots — 1ANDREA BERTON1, JUAN CLIMENTE1, GUIDO GODOLIS1,2, MASSIMO RONTANI1, and ELISA MOLINARI1,2 — 1CNR S3 National Research Center, Modena, Italy — 2Diapartimento di Fisica, Università di Modena e Reggio Emilia, Modena, Italy

Triplet-singlet relaxation in cylindrical quantum dots containing few interacting electrons is studied numerically via direct diagonalization of Coulomb and spin-orbit interactions. The transitions induced by the coupling with phonons can be tailored by magnetic fields.

Superconductivity and Highly-Correlated Systems - Poster Session

Several Interesting Things — 1MASSIMO CAFONEL1, LUCA DE’ MEOI2, ALESSANDRO TOSCHI1, and GIORGIO SANGIOVANNI1 — 1SMC, CNR-IFM and University of Rome La Sapienza, Piazzale Aldo Moro 2, 00185, Roma — 2Rutgers University, Piscataway, NJ USA — 3Max Planck Institut Stuttgart, Stuttgart, Germany

We theoretically analyze some of the anomalies of the optical sumrules in the high-temperature superconductor. We find many nice things that you can find in the extended abstract.

Several Interesting Things — 1MASSIMO CAFONEL1, LUCA DE’ MEOI2, ALESSANDRO TOSCHI1, and GIORGIO SANGIOVANNI1 — 1SMC, CNR-IFM and University of Rome La Sapienza, Piazzale Aldo Moro 2, 00185, Roma — 2Rutgers University, Piscataway, NJ USA — 3Max Planck Institut Stuttgart, Stuttgart, Germany

We theoretically analyze some of the anomalies of the optical sumrules in the high-temperature superconductor. We find many nice things that you can find in the extended abstract.

Extrinsic Carrier Self-Trapping in the Anisotropic Polar Materials — 1EMRUMUHAMAD DUSHANOVA1,2, SARIYAN DEHMUJANOVA,2, and ALSHANBAEV AYBYRAEVA1

1Joint Institute for Nuclear Research, Dubna, Russia — 2Institute of Nuclear Physics, Tashkent, Uzbekistan

Using the continuum model and adiabatic approximation, the ground-state energies of doped holes in the hole-doped cuprates are calcu-
22nd General Conference of the Condensed Matter Division of the European Physical Society - Thursday 28 August 2008

Aula 3

THU3F4.4 15:40
University classes for Coulomb-frustrated phase separation — CARMINE ORTIX1,2,3, JOSE LORENZANA1, and CARLO DI CASTRO1,4 — Institute-Lorentz for Theoretical Physics, Universiteit Leiden, Postbus 9506 2300 RA Leiden, The Netherlands — Dip. di Fisica Università del Salento and INFN Sez. di Lecce, Via per Arnesano, 73100 Lecce, Italy — SMC-INFM, ISC-CNR, Dip. di Fisica Università degli Studi di Roma “La Sapienza”, P. Aldo Moro 2, 00185 Roma, Italy — Dip. di Fisica Università degli Studi di Roma “La Sapienza”, P. Aldo Moro 2, 00185 Roma, Italy

We discuss universal aspects of Coulomb-frustrated phase separation in negative short-range compressibility systems and systems with a cusp singularity in the energy. Both situations often arise in strongly correlated electronic systems.

THU3F5 16:00
Giant Magnetostriction of Composite — GIULIO DEGREG1, FRANCO VINAI2,3, PAOLA TERRITO1, and FEDERICA CECILOTTO1 — INRIM, Electromagnetism Division, Strada delle Cacce 91, 10135 Torino (TO), Italy

Spin reorientation transition and perpendicular magnetic anisotropy in FeSiB amorphous thin films have been tailored by varying preparation conditions, thickness and resulting stresses. A vector model provides full understanding of in- and out-of-plane anisotropy roles.

THU3F6.3 15:40
Lévy flight in a two competing species dynamics — DAVIDE VALENTI1, ANGELO LA COGNATA1, BERNARDO SPAGNOLO1, and ALEXANDER DUKHOV2 — Dipartimento di Fisica e Tecnologie Relative, Università di Palermo and CNISM-INFM, Unità di Palermo, Group of Interdisciplinary Physics, Viale delle Scienze, I-90128 Palermo, Italy — N.I. Lobachevsky State University of Nizhniy Novgorod, 23 Gagarin Ave., Nizhniy Novgorod 603950, Russia

We analyze the dynamics of two competing species described by generalized Lotka-Volterra equations, with random interaction parameter and multiplicative Lévy noise. Mean extinction time of one species is analyzed as a function of noise intensity.

Rettorato

THUp.SUP.5 16:30
Luttinger liquid state with effective attractive hard-core interaction — IGOR KARNAUKHOV1 — Institute of Metal Physics, Vernadsky Street 36, 63142 Kiev, Ukraine

A model of coupled free-fermion chains is proposed and solved exactly by the means of the Bethe ansatz. An effective attractive hard-core interaction induces a new phase state of the coupled chains.
Electronic structure of strongly correlated electronics and mechanisms of high temperature superconductivity in cuprates — Sibylle Gavrichkov1,2, Vladimir Gavrichkov1,2, Maxim Korshunov1,3, and Elena Sinkevich1,3 — INFN-Laboratori Nazionali di Frascati,

Nanotubes, and magnetic field effects on the Luttinger Liquid regime in Carbon Nanotubes — INFN-Laboratori Nazionali di Frascati.

Ab-initio hole localization and singlet polaron in 1D cuprates — Alessio Filippetti and Vincenzo Fiorentini — CNR-INFM-SC-ALSAC and Physics Dept., Cagliari University, Italy.

We present an ab-initio band-theory-based description of spin-compensated polarons in the 1D hole-doped cuprate CaCuO2. They turn the inulating undoped antiferromagnet into a gap insulator, a metallic paramagnet, and finally an inulating diamagnet.

Spin-vibronic superexchange and dynamical vibronic order in ammoniated cubic Bi2Sr2CaCu2O8+δ — Gianluca Mazzuelo, Virginio Fiorentini, and Alessio Filippetti — CNR-INFM-SC-ALSAC and Physics Dept., Cagliari University, Italy.

The ground state and low-lying excitations in the cubic fulleride Li3(NH3)6 C60 are governed by a new type of exchange interaction, the spin-vibronic superexchange between neighbour fullerene sites.

Fermi-surface evolution across the magnetic phase transition in the Kondo lattice model. — Paolo Barone1, Michele Fabrizio1,2, and N. Lanata1,2 — International School for Advanced Studies (SISSA) and CNR-INFM-DMC, Italy.

We derive the phase diagram of the Kondo lattice model by means of an extended Gutzwiller wave-function. We find that generally the model displays an f-electron Mott localization which may desistance from the onset of magnetism.

Characterization of the quantum phase diagram of the one-dimensional bond-charge extended Hubbard model — Alessio Alfonsi1,2, Adriana Montorsi1, and Cristian degli Esposti Boschi1,2 — Dipartimento di Fisica, Università di Roma “La Sapienza”, Italy.

We characterize the zero-temperature quantum phase diagram of the one-dimensional bond-charge extended Hubbard model at half-filling.

Condensed matter properties in 6d — Enzo Bonacci — Institute of Physics, INFM-SC-ALSAC.

Flux flow resistivity above critical temperature is analyzed based on increased evidences that high temperature superconductors are intrinsically homogeneous and local nonpercolating superconducting domains persist far above critical temperature.
Condensed Cooper Pairs and gravimagnetic anomalies may find a unitary explanation in a 6d reference frame after some recent proofs of time’s three-dimensionality leading to the consequent six-dimensional extension of Einstein field equations.

THUp.SUP.21  16:30
Annealing and Nanoparticle Doping Effects on Superconducting and Normal-state Properties of MgB2 Bulk Samples grown by Reactive Mg Liquid Infiltration Technique — 
Laurenza Gazzellino1,2, Gianluca Giorgi1, Franco Levigno1, Laura Pardini1,2, Bruno Minetti1,2, Franco Monticone1, Chiara Portesi1, and Enrica Mezzetti2. — 1 Dipartimento di Fisica, Politecnico di Torino, C.so Duca degli Abruzzi 24, 10129 Torino, Italy. 
Within utility function approach to binary choice, data of a medium-size health organization has been analyzed. 
A data mining analysis, based on the theory of local-World Networks with Node Competitions, is introduced. 
In such networks a transformation from assortative to disassortative. We have studied the order-disorder transitions are uncoupled.

THUp.SUP.23  16:30
Chain metallicity and antiferromagnetism-paramagnetism competition in underdoped YBa2Cu3O7−x films — 
Gianluca Giorgi1,2, Bruno Minetti1,2, Roberto Gerbaldi1,2, Laura Gazzellino1,2, Franco Levigno1,2, Bruno Minetti1,2, Roberto Cherubini1,3, Alberto Rovelli1,2, and Enrica Mezzetti1,2. — 1 Departamento de Fisica, Politecnico di Torino, C.so Duca degli Abruzzi 24, 10129 Torino, Italy. 
Nonlinear effects in magnesium diboride thin films are investigated in the microwave regime by a coplanar resonator technique, with particular focus on vortex-avalanche-induced and on weak-link-induced jumps in the resonance curves.

THUp.SUP.24  16:30
Localized nanostructural functionality of superconducting YBa2Cu3O7−x films — 
Gianluca Giorgi1,2, Bruno Minetti1,2, Laura Gazzellino1,2, Franco Levigno1,2, Bruno Minetti1,2, Roberto Cherubini1,3, Alberto Rovelli1,2, and Enrica Mezzetti1,2. — 1 Departamento de Fisica, Politecnico di Torino, C.so Duca degli Abruzzi 24, 10129 Torino, Italy. 
The x-dependent in-plane antiferromagnetic-paramagnetic and chain order-disorder transitions are uncoupled.

THUp.SOC.1  16:30
Critical network size of terrorist conspiracies — 
Graph-theoretic network percolation theory has been applied to the social networks of terrorists. It is shown that there is a tipping point in the number of conspirators, beyond which interdiction becomes increasingly likely.

THUp.SOC.2  16:30
Institutional structures as Benard-Taylor processeses — 
Mouni Purica — IPE Romanian Academy, Bucharest, Romania. 
A model was developed in which the reaction-diffusion of mimes (Dawkins) in a human niche (Popper) is described as a Brusselator presenting far from equilibrium stabilities of Benard-Taylor type associated to evolution of institutional structures.

THUp.SOC.3  16:30
Multi-stability: Social Systems and Stabilities — 
Katarzyna Ostaszewicz, Andrzej Radosz, and Piotr Magnuszewski. 
Institute of Physics, Wrocław University of Technology, Wybrzeże Wyspianskiego 27, 50-370 Wrocław, Poland. 
Within utility function approach to binary choice, logistic distribution of random term leads to the mean-field statistical physics result of finite Ising model. The status of this distribution in the utility function method is discussed.

THUp.SOC.4  16:30
A data mining approach to health organization problems — 
Giancarlo Cappellini1,2, Luigi Minerva2,3, Alessandro Chessa1,3, Gian Mario Ieva1,3,4, and Nicola Piera1,4. — 1 CNR-NE, D. di Cagliari, Monserrato (Ca), Italy. 
2 Public Health Department - Policlinico Universitario, Cagliari, Italy. 
3 Linkalab - Center for the Study of Complex Networks, Cagliari, Italy. 
A data mining analysis, based on the theory of complex networks, of one-year standard discharge data of a medium-size health organization has been performed and discussed in detail.

THUp.SOC.5  16:30
Path-integral option pricing in a stochastic interest rate Heston model — 
Damian Lemmens1, Michiel Wouters1, Jacques Tempere1, and Sven Foulon2. — 1 TFYS, University of Antwerpen, Belgium. 
2 KBC Bank, Belgium. 
A path-integral calculation scheme is presented (and checked with Monte-Carlo) to obtain option prices in a setting where both the interest rate and volatility are stochastic. It is uniquely suited for pricing path-dependent exotics.

THUp.SOC.6  16:30
Robustness and Spreading Processes in Local-World Networks with Node Competition — 
Tatiana Prokoglu, Bahruz Gadjev, and Darja Schetina. — International University for Nature, Society and Man, Dubna, Russia. 
Local-world networks with nodes competition is introduced. In such networks a transformation occurs with the change of the local-world size from assortative to dissortative. We have studied spreading processes in these networks.
Evolving networks by merging nodes — FARINAZ ROSHANI — Department of Physics, Alzahra University, Tehran, 19938-91167, Iran.

We study merging mechanism for the creation of complex networks in several models.

Application of Exponential Model for Option in the Ibovespa Index — ANTONIO KAHOS and GIOVANI VASCONCELOS — Pernambuco Federal University, UPPE, Av. Professor Luiz Freire, s/n Recife-PE, Brazil

We make a comparative study between the market prices for Ibovespa call options and the corresponding predictions of the standard Black-Scholes model and an empirical model that assumes an exponential distribution for returns.

Statistical Physics Methods in Elections — CHUNG-I CHOU1, SAIPING L2, JILUN TSENG2, and SUN-CHONG WANG3

1Department of Physics, Chinese Culture University, Taipei 111 Taiwan. — 2Institute of Physics, Academia Sinica, Taipei 115 Taiwan. — 3Institute of Physics, National Central University, Chungli 320 Taiwan. The contribution has been withdrawn by the authors.

Dynamical Financial Networks in Financial Markets — KYUNGSEK KIM1, S00 YONG KIM2, and ENRICO SCALAS3 — 1Department of Physics Pukyong National University, Busan 608-737, Korea. — 2Department of Physics, KAIST, Daejeon 350-701, Korea. — 3Department of AST, East Piedmont University, Alessandria 15100, Italy.

We investigate four financial networks in the KSE, TSE, CSM, and NYSE, using numerical simulations and scaling arguments. We present the cross-correlation, degree distribution, and edge density estimated numerically from the market graph.

Lost Work, Extra Work and Entropy production for a system with complexity: the nano-stepwise Carnot cycle — FRANCESCO DI LIBERTO — Dipartimento di Scienze Fisiche, Universita di Napoli Federico II, Napoli, Italy and CNR-INFN, Unità di Napoli di liliberto@na.infn.it. +39 081 676346

Lost Work, and Extra Work are analyzed and evaluated for a process with complexity: the nano-stepwise Carnot cycle, a cycle performed by means of N very small weights added and removed from the piston.

Robust oscillatory dynamics in the Ibovespa Index — DAVIDE VALENTI, DOMINIQUE PERSANO ADORNO, and BERNARDO SPAGNOLI — Dipartimento di Fisica e Tecnologie Relative, Università di Palermo, Viale delle Scienze, Ed. 18 - 90128 Palermo, Italy

The dynamics of cancer progression is modeled by considering the stochastic evolution of cell populations which can experience genetic mutations. Several scenarios in the evolutionary dynamics of leukemic cells are described for different modeled therapies.

Three-body Interactions in Coalition Forming — MARCELO DEL CASTILLO-MUSSOT, FERNANDO SAMANIEGO-STEFA AND, GERARDO GARCIA NAUSIS — Institute of Physics, National Autonomous University of México (UNAM), Apartado Postal 20-364, 01000 México D. F., México

We present a study of the effects of three-body interactions in the process of coalition formation, and we apply the model to a simplified scenario of the Iraq war.
Field emission studies on carbon nanotubes in alumina templates — Fabrizio Odorici, Renato Angelucci, Ilario Boscolo, Simone Cialdi, Alessandro Corbera, Marco Cuffiani, Luciana Malferri, Alessandro Montanari, Rita Rizzoli, Marco Rossi, Vito Sessa, Maria Letizia Tesorone, Gian Luca Vergnano, and Gilles Guiochon

THUp.SUR.6 16:30

The adsorption of Pb on Si (100)-2x1 surface: Intermixing at interface. — Pavel Shukryna, Martin Svec, Martin Vondracek, Pingo Mutombo, and Vladimir Chab — Institute of Physics, Academy of Sciences of the Czech Republic, Cukrovarnicky 10, CZ 162 53, Prague, Czech Republic.

We studied Pb adsorption on the Si (001)-2x1 surface deposited at RT using VT STM/STS. New chains with contrast different from Pb chains are found on the surface. They are parallel to the Pb rows.

THUp.SUR.7 16:30

Ordered surface-alloys formation in the Hf/W(100) adsorption system — Anna Ciesielski, Arthur Tremblulowicz, Leszek Jurczyn, and Zbigniew Szczudlo — Institute of Experimental Physics, University of Wroclaw, pl. Malea Borna 9, 50-204 Wroclaw, Poland.

Surface alloying in Hf/W(100) system was studied using STM, LEED and AES. Two ordered c(2x4) and (1x5)xR26.6 phases were observed. Ab-initio molecular dynamics calculations proved that they respectively correspond to H3EW and H4W surface alloys.

THUp.SUR.8 16:30


We have demonstrated the possibility of calculating of anisotropic conductance oscillation caused by electron scattering by the defect. The analysis of interference patterns makes it possible to find the position of the defect below surface.

THUp.SUR.9 16:30

Field emission studies on carbon nanotubes in alumina templates — Fabrizio Odorici, Renato Angelucci, Ilario Boscolo, Simone Cialdi, Alessandro Corbera, Marco Cuffiani, Luciana Malferri, Alessandro Montanari, Rita Rizzoli, Marco Rossi, Vito Sessa, Maria Letizia Tesorone, Gian Luca Vergnano, and Gilles Guiochon

THUp.SUR.10 16:30

Nonequilibrium Potential Approach: New Aspects —Horacio S. W. — Instituto de Fisica de Cantabria, Santander, SPAIN.

SR in spatially extended systems, including non-local contributions with an "optimal" value giving a SR's maximum response, are obtained; a NEP for KPZ, conjectures proved, and SR in a "bounded KPZ" discussed.

THUp.SUR.11 16:30

Potential energy surface of sliding interfaces: insight into the tribological properties of nanoscale materials, two cases studied — Giovanna Zeliotto, Maria Clelia Ricchi, Mauro Ferreiro, and Carlo Maria Berthon — 1-CNR IMM sezione di Bologna, V. Gobetti 105, 40126 Bologna, Italy — INFN and Dipartimento di Fisica Università di Milano, via Celoria 16, 20133 Milano, Italy — 2-Dipartimento di Matematica, Università di Milano, via S. Geremia 24, 20133 Milano, Italy — 3-CNR IMM sezione di Bologna, V. Gobetti 105, 40126 Bologna, Italy — INFN and Dipartimento di Fisica Università di Milano, via Celoria 16, 20133 Milano, Italy — 4-Dipartimento di Fisica, Università Roma La Sapienza, via A. Scarpa 16, 00161 Roma, Italy — 5-Dipartimento di Fisica Università di Bologna, V. Le B. Pichat 6/2, 40127 Bologna, Italy — INFN, V.le B. Pichat 6/2, 40127 Bologna, Italy — 6-Dipartimento di Scienze e Tecnologie Chimiche, MINASlab, Università di Roma Tor Vergata and INFN, via della Ricerca Scientifica, 00133 Roma, Italy.

Carbon nanotubes electronic and geometrical properties make them almost ideal nanomaterial for building electronic devices. Open questions about field emission are discussed by comparing simulations with measurements on carbon nanotubes in alumina templates.

THUp.SUR.12 16:30

Boundary between bcc and hcp lattices in a 4 He Quantum Crystal (Local oscillations and dissipation) — Victor Lykhar and Eugene Syrkin — National Technic University “Kharkiv Polytechnic Institute”, 21 Prunne Str., Kharkiv, 61002, Ukraine — 2-Institute for Low Temperature Physics and Engineering of NAS, 47 Lenin Ave., Kharkiv, 61103, Ukraine.

Microscopic transition between bcc and hcp phases is considered. The form and energy of the boundary are found. Spectral local oscillations on the boundary is found. The mechanism meets recent experiments in solid He.

THUp.SUR.13 16:30

Light-induced growth and demolition of alkali metal nanoparticles in porous silica — Alessia Burchianti — CNISM and Physics Department, University of Siena, I-53100 Siena, Italy.

Light-induced structural changes of alkali-metal nanoparticles grown in porous silica are analysed. Light, depending on its frequency, induces either growth or demolition of alkali metal clusters with size and shape determined by the host-guest interaction.

THUp.SUR.14 16:30

Physical properties of nanostructured Si layers induced by high energy ions implantation — Antonio Serra, Daniela Mano, Emanuela Filippi, Luccio Calcagnile, Giannicola Quarta, Luccio Maruccio, and Marco Rossi — 1-Dipartimento di Scienza dei Materiali - Universita* a Salento I-73100 Lecce (Italy) — 2-Dipartimento di Ingegneria dell’Innovazione - Universita* a Salento CEDAD, I-73100 Lecce (Italy) — 3-Dipartimento di Energetica * Universita* di Roma *La Sapienza* I-00161 Roma (Italy).

In this work a tandem-type accelerator at 3 MV acceleration voltage, has been used to implant oxygen ions on Si(001). The detailed understanding of the physical properties has resulted the application of complimentary techniques.

THUp.SUR.15 16:30

Van der Waals interactions by Wannier functions and the adsorption of Ar on graphite — Karima Benyahia, and Pier Luigi Silvestrelli — Dipartimento di Fisica *Galilei*, Università di Padova, via Marzolo 8, I-35131 Padova, Italy.

We apply the novel Maximally localized Wannier functions (Van der Waals interactions) to adsorption of Ar on graphite.

THUp.SUR.16 16:30

Charge and Discharge Process on SiO2 by SPM Techniques: Towards Data Stor- age Devices — Elsange Silva-Pinto and Bernardo Ruckger Almeida Neves — Departamento de Física, Universidade Federal de Minas Gerais, Av. Antônio Carlos, 6627, Cep. 30123-970 - Belo Horizonte, Minas Gerais, Brasil.

Careful study of charging and discharging processes on SiO2 is realized by SPM techniques. The influence of air relative humidity and surface hydrophobicity is analyzed and a complete route to develop memory devices is presented.

THUp.SUR.17 16:30

Electrical Conduction Mechanism in Titan- nium Oxide Thin Films — Diana Mandare and Gheorghe I. Rusu — Alexandru Ioan Cuza University, Faculty of Physics, Iasi,Romania.

In this study, a model have been proposed (Bac- caranii) to explain the mechanism of electrical conduction in TiO2 sputtered thin films. Impurity concentration and the constant interface-state distribution have been calculated using Bac- caranii model.

THUp.SUR.18 16:30


Using six-band hole Hamiltonians, we analysed excitons in wurtzite AlGaN/GaN quantum-well heterostructures. A non-adiabatic approach is needed in order to quantitatively interpret the observed positions and ratios of the intensities of the photoluminescence peaks.

THUp.SUR.19 16:30

High-field electronic transport in thin- film systems of the metal/organic poly- mer/metal type — Gheorghe Rusu, AN-
Electronic properties of Si(111)/alkyl monolayer interfaces — DAMIEN AUREAU — Laboratoire de Physique de la Matière Condensée, Ecole Polytechnique, Route de Saclay 91120 Palaiseau, France — Hahn-Meitner-Institut Abteilung Silizium-Photovoltaik, (SE1) Kekuléstrasse 5D-12489 Berlin

Si-alkyl surfaces were investigated using infrared spectroscopy, in-situ photoluminescence and photovoltaic measurements. They exhibit the same electronic quality as Si-H surfaces with a higher stability, even in contact with buffer solutions up to pH 9.

Size and shape tuning of silver nanostuctures by a rapid microwave assisted green method — EMANUELA FELIPPO, DANIELA MANNO, and ANTONIO SERRA — Dipartimento di scienza dei Materiali - Università del Salento— Dipartimento di Fisica, Università di Modena e Reggio E., via Campi 213/A, IT-41100 Modena, Italy — 1NFNM-CNR-SiS, Natl. Center on nanOS- tructures and bioSystems at Surfaces, via Campi 213/A, IT-41100 Modena, Italy — 2Instituto di Fisica “G. Ciocca”, Università di Pavia, Cisalde Universitaria, SP-5508-900 São Paulo, Brazil

We investigate from first-principles the electronic and transport properties of hybrid organic-silicon interfaces made with conjugated molecules. The effects on transport of molecule–substrate bonding are explicitly analysed. Oxygen-bonded interfaces are identified as promising systems.

Antiferromagnetic Ordering in Adsorbed C60 on the Si(100) Surface: Density-Functional Theory Calculations — YOUNG LEE, MYUNG HO KANG, and JUN-HYUNG CHO — 1Department of Physics, Pohang University of Science and Technology, Pohang 790-784, Korea — 2BK21 Program Division of Advanced Research and Education in Physics, Hanyang University, 17 Haengdang-Dong, Seongdong-Gu, Seoul 133-791, Korea

We study the atomic and magnetic properties of the C60/Si(100)-c(4×4) surface using spin-polarized density-functional calculations. We predict the presence of antiferromagnetic coupling between uppaired dangling bonds within the conventional structural model.

Calculation of Contact Supercooling for InAs-Substrate Contacting with SB-Solution in Ga-Melt — YEVGEN BAGANOV and STANISLAV SHUTOV — Kherson National Technical University, Kherson, Ukraine

At present work the contact supercooling for the system InAs substrate - solution Sb in the Ga melt, in the range of the contact temperatures 400-650 °C and (100) and (111) substrate orientation is calculated.

Technological aspects of the C60/alkylsilane interaction with TiO2 at room temperature. — BRUNO RENZI, NICOLÒ DI QUAGLIO, and PAOLO VANNETTI — Istituto di Fotonica e Nanotecnologie, Sezione di Firenze, CNR, Via S. Marta 3, I-50134 Firenze, Italy

The study was aimed at understanding the technological impact of the C60/alkyl interaction on TiO2 surfaces.

Cross-sectional STM of the GaN (-2110) plane — DAVID KRÜGER, THOMAS SCHMIDT, JAN INGO FLEIGE, TIMO ASCHENBRENNER, STEPHAN FIGGÉ, DETLEF HOMMEL, and JENS FAULTA — University of Bremen, Bremen, Germany

The (-2110) plane of a cleaved single GaN crystal has been investigated using cross-sectional scanning tunneling microscopy. The finding of a 1x1 unit cell points towards a stable bulk termination at room temperature.

Localization and Magnetic Properties of the Ground State of the MnII Centers in ZnS Nanoparticles — SERGIO V. NISTOR1, 4 MARIANA STEFAN1, LIONA C. NISTOR1, CAR- MEN CITA MATESCU1, RUXANDRA BIELIGEA2, and ETIENNE GOVAERTS3 — 1National Institute of Materials Physics, Bucharest-Magurele, Romania — 2Institute of Solid State Physics, Sofia, Bulgaria — 3University of Antwerp - CDE, Wilrijk, Belgium

The localization and spin Hamiltonian parameters of three MnII centers in nanostructured ZnS with mesoporous structure were for the first time unambiguously determined from the quantitative analysis of multifrequency Electron Paramagnetic Resonance spectra.

Surface Analysis of III-Nitride Based Local Polarity Heterostructures — PIERRE LOREZ4, SANDY HAUGHTH FRANK5, JUERGEN SCHAEFER6, VAADIM LEBOVICS7,8, and STEFAN KIRSCHOK9 — 1Institut für Physik und Institut für Mikro- und Nanotechnologien, Technische Universität Ilmenau, P.O. Box 100565 D-98684 Ilmenau, Germany — 2Research Institute for Applied Solid State Physics, Tullastr. 72, 79108 Freiburg, Germany

We investigated ex-situ and in-situ grown N-face and Ga-face GaN and GaN-based LPHs (periodicity 2-5 μm) grown on sapphire substrates by molecular beam epitaxy (MBE). The GaN samples were studied by surface sensitive techniques.
Optical properties of periodic ensembles of metal nanowires for sensing — MARIYA SONNOVA, NICHOLAS DMITRIEV, ALEXANDR KOROVIN, and OLGA MAYeva — Institute of Semiconductor Physics, National Academy Science of Ukraine, 41 Prospect Nauki Kyiv, Ukraine. Both the influence of ensemble characteristic on the optical properties of the samples were investigated.

THUp.SUR.33 16:30

Optical properties of graphene spin valve devices – MARIANO LABATE, O.MALLEY, MATIA PICCIONI, and ANTONIO PAPAGNI – 1Institute of Industrial Science, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo, Japan — 2Department of Physics, National University of Singapore, Singapore — 3University of Lecce, Italy. We study the optical properties of thin films of graphene produced by spin valve techniques. The effect of the spin valve on the optical properties of graphene was studied.

THUp.SUR.34 16:30

Magnetoresistance and Fabry-Perot interference in graphene spin valve devices – MASASHI Ono, SATOSHI MASUBUCHI, KOHEI Hamaya, MINORU KAWAMURA, and TOMOKI Machida – 1Institute of Industrial Science, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan — 2Institute for Nano Quantum Information Electronics, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan. We study oscillatory changes in magnetoresistance of graphene in graphene spin valve devices.

THUp.SUR.35 16:30

Optical properties of inorganic/organic semiconductor hetero-structures: quaterthiophene intercalated in cadmium chalcogenophosphate (CdPSi3) crystals and hetero-structures of CdPSi3 intercalated with quaterthiophene molecules, thus showing the synergistic effect of the organic and inorganic components – 1Masashi Ono, 2Satoru Masubuchi, 3Kohei Hamaya, 4Minoru Kawamura, and 5Tomoki Machida – 1Institute of Industrial Science, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan — 2Institute for Nano Quantum Information Electronics, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan. We report and compare the UV–vis optical functions and emission properties of cadmium chalcogenophosphate (CdPSi3) crystals and hetero-structures of CdPSi3 intercalated with quaterthiophene molecules, thus showing the synergistic effect of the organic and inorganic components.

THUp.SUR.36 16:30

Ab initio simulation of C clustering on Ni(111) surface: the bonding between Ni and C – GALINA Kalibava, 1Rodolph Vullhimer, 2Ali Alavi, 1Simone Meloni, and 2Giovanni Cuccotti – 1Universita di Roma “La Sapienza”, Roma, Italy — 2Universite Pierre et Marie Curie, Paris, France. We analyse the electronic structure and state occupations of adsorbed carbon on Ni(111) surface at different coverages using carbon effective molecular orbitals obtained from rediagonalization of maximally localized Wannier orbitals assigned to carbon atoms.

THUp.SUR.37 16:30

Gas sensitivity mechanism of MIS structures based on nanoporous silicon/catalytic Me composites – 1MIGUEL Daniluev, 2Tetyana Gorbanu, and 1Volodymyr Litovchenco – 1Kiev Taras Shevchenko national university, Radiophysical faculty, prospect Glushkova 5, 03125, Kiev, Ukraine — 2V. Lashkaryov Institute of Semiconductor Physics, NAS Ukraine, prospect Nauki, 41, 03028 Kiev, Ukraine. During our investigation, it was found that the MIS-structures based on nanoporous silicon films with embedded different transition Me microparticles possess enhanced sensitivity to some gas molecules. Mechanism of these phenomena has been studied.

THUp.SUR.38 16:30

Peculiarities of light propagation through thin corrugated metal films in surface plasmon polariton regime – 1ALEXANDER KOrovin and MARIYa SONNOVA – 1V.E. Lashkaryov Institute of Semiconductor Physics, NAS of Ukraine, 41 prospect Nauki, Kiev, 03028, Ukraine. We report and compare the UV–vis optical functions and emission properties of cadmium chalcogenophosphate (CdPSi3) crystals and hetero-structures of CdPSi3 intercalated with quaterthiophene molecules, thus showing the synergistic effect of the organic and inorganic components.

THUp.SUR.39 16:30

Surface charge modes on GaAs nanowires probed by Raman spectroscopy – 1E. SPEIZER, 2W. RICHTER, 3P. PFEITZ, 4P. PAIONO, and 5N. LOVENCE – 1Dipartimento di Fisica, CNR-NISM, Universita di Roma Tor Vergata, 00133 Roma, Italy — 2IM-CNR, Unité de Letce, Via Arnesano, 73100 Lecce, Italy — 3CNR, and Dipartimento di Ingegneria dell’Innovazione, Universita del Salento. We have performed Raman measurements on single GaAs nanowires which show several surface modes. This assignment is made via the polarization rules, frequency analysis and calculations from the dielectric continuum model.

THUp.SUR.40 16:30

Local screening of a carbon nanotube by a STM tip – 1MARINE GUGDOU, 2ADELINE CREVEUX, and 3THEOerry MARTIN – Centre de Physique Théorique, Marseille, France. We address the question of local screening of a carbon nanotube by a STM tip. Considering their effects, we analyse to what extent they affect the transport in the nanotube.

THUp.SUR.41 16:30

The anisotropic growth of a vicinal surface under the meandering instability – 1ALBERTO VERGA – Aix-Marseille Université, Im2nP, Marseille, France. The step flow dynamics of a vicinal surface is intrinsically anisotropic. We derive an evolution equation and investigate the scaling properties of the surface roughness and demonstrate that length scales and height amplitude satisfy scaling laws.

THUp.SUR.42 16:30

Charge spectroscopy of quantum confine levels and transport in SiGe quantum well – 1MIRON Kagan, 2IRINA Antonova, 3Svetlana Smaguloa, 4Efim Neustroev, 5Pavel Alekseev, and 6James Kolodzyey – 1Institute of Radio Engineering and Electronics, Russian Academy Sci., Moscow, Mokhovaya 11, Russia — 2Institute of Semiconductor Physics, Russian Acad. Sci., Novosibirsk, Lavrentiev 13, Russia — 3Vukatch State University, Vukatch, Saha Republic, Belingskogo 32, Russia. We report and compare the UV–vis optical functions and emission properties of cadmium chalcogenophosphate (CdPSi3) crystals and hetero-structures of CdPSi3 intercalated with quaterthiophene molecules, thus showing the synergistic effect of the organic and inorganic components.
effect is strongly enhanced with the reduced dimensions consistent with the directional scat-
ttering picture.

THUp.SUR 47 16:30
Noble metal nanoparticles fabrication and fragmentation by femtosecond laser abla-
tion: size comparison by extinction spectroscopy and electron microscopy
• GUSTAVO TOLKOW, RONALDO LUC-
CIA SCAFFARDI1,2, PABLO MORENO2, and LUIS
ROSO2 — 1Centro de Investigaciones Opticas,
CIC-CONICET, cc 124 La Plata (1900), La Plata, Argentina — 2Centro de Investigaciones Opticas,
Universidad de Salamanca, Plaza de la Merced s/n, Salamanca, Spain — 3Area Departamental de Ciencias Basi-
cas, Facultad de Ingenieria, Universidad Nacional de La Plata, La Plata, Argentina
Gold and silver nanoparticles were fabricated by femtosecond laser ablation immersed in liq-
uid media. We compare the extinction spec-
troscopy against TEM and discuss different mech-
nisms involved in the decrease of particle size due to fragmentation.

THUp.SUR 48 16:30
Atmospheric ionization in urban centres and suburbs areas — • FLORIAN MANDILA — University of Shkidra, Department of Physics, Shked, Albania
This study concerns on the small air ion concen-
tration. This is correlated with the meteorological parameters, the concentration of aerosols, the ra-
diation level, the presence of electric fields, solar radiation, cosmic rays, etc.

16:30 – 18:40
Biological Physics & Life Sciences - Poster
Session

THUp.BIO 1 16:30
Spectroscopic studies on binding of cationic Phophorhbia-de derivative to model polynucleotides — • OLGA
RYAZANOVA1, IGOR VOLOSHIN1, IGOR DUBEY2, LARISA
DUBEY2, and VICTOR ZOUKUYA4 — 1Department of Molecular Biophysics, B. Verkin Insti-
tute for Low Temperature Physics and En-
gineering, NAS of Ukraine, 47 Lenin ave., 61103, Kharkov, Ukraine — 2Department of Nucleotide
Chemistry, Institute of Molecular Biology and Genet,
ics, NAS of Ukraine, 150 Zabolotnogo str., 03143, Kyiv, Ukraine
The binding of new cationic Phophorhbia-de derivative to double-stranded poly(A)-poly(U),
poly(G)-poly(C) and quadruplex poly(G) was in-
vestigated in buffered solutions by methods of ab-
sorption and polarized fluorescence spectroscopy in a wide range of molar phosphate-to-dye ratios.

THUp.BIO 2 16:30
The Morphological Features of a Human Cancer Cell Surface Under Reflected Light
Microscope — • ADRIAM PAZIEY and VICTOR
KRKHALMALEV — Institute of Electronics Uzbek
Academy of Science, Tashkent, Uzbekistan
A technique for revealing epithelial cell microstructure has been developed to facilitate early diagnostics of a pre-cancer and cancer cells under reflected light microscopy.

THUp.BIO 3 16:30
Molecular mechanism of capped-RNA binding to human nuclear CBC
— RIVZIKAR STOLARICH1, REMI GIUSEW WORCH1,2,
ANNA NIEDZIECKA1,2, MARZENA JANKOWSKA-
ANYSZKA1, JANUSZ STEPIŃSKI1, CATHERINE MAZZA1,2, EDWARD DABRZYNKIEWICZ1, and STEPHEN CUSACK4 — 1Division of Biophysics, Institute of Experimental Physics, University of
Warsaw, 02-093 Warszawa, Poland — 2Biological Physics Group, Institute of Physics Polish Academy of Sciences
32/46 Lotnikow Ave. Warszawa, Poland — 3Faculty of Chemistry, University of Warsaw, 1 Pasteur St., 02-093 Warszawa, Poland — 4European Molecular Biology Laboratory, 6 rue J Horovitz, 38024 Grenoble Cedex 9, France — 5Centre d’Immunologie de Marseille-Luminy, Marseille, France
Association of mRNA-cap with cap-binding complex was followed by spectroscopy and quantum
mechanically calculated. A model of the recognition was com-
pared with that for initiation factor 4E leading to clues on CBC-to-eIF4E exchange of mRNA.

THUp.BIO 4 16:30
Raman microscopy as a tool for chemical imaging of complex materials — • ANNA
CHIARA DE LUCA1,2, GIULIA RUSCIGNO1,2, GIUSEPPE PESCI1,2, and ANTONIO SASSO1,2 — 1Università di Napoli Federico II, Dipartimento di Scienze Fisiche, Via Cintia IT-80126 Napoli, Italy — 2CNISM– Consorzio Nazionale Interuni-
versitario per le Scienze Fisiche della Materia, UdR Napoli, Italy — 3CNR-INFN Coherentia—
Università di Roma “La Sapienza”, Piazzale A. Moro 5, I-00185 - Rome (Italy) and INFN CRS-SOFT, Unità di Roma 1
Bioinspired light-harvesting materials are can-
didates for high efficiency photovoltaic devices, where the photo-induced charge separation mecha-
nism plays a role. A TDDFT study on optical properties for a biomolecule of this class is pre-
sented.

THUp.BIO 5 16:30
Protective role of HSA in hemolysis caused by
dendrimers — • BARBARA KLAMERT, SYL- WIA PIKALA, and MARIA BRYZYSZewska — Depart-
ment of General Biophysics, University of Lodz, Poland
It is known that hemolysis of den-
trimers is lower in the presence of human serum albumin. The protective effect is related to a high
affinity of dendrimers towards proteins.

THUp.BIO 6 16:30
Response of pheromone molecules to en-
vironmental factors — FELIX TOMLIN1,2, ELENA SEDOVA1, OLEISHA OSINA1, POLINA
VOLKOV2, VYACHESLAV SOUKHOVLOVSKY2, SERGEY
OVCHENNIKOV1,3, and TAMARA
OVCHENNIKOVA2 — 1Siberian Federal
Uni-
versity, av. Svobodnyi 79, Krasnoyarsk 660041, Russia — 2V.N. Sukatchev Institute of Forest
RB SAs, Krasnoyarsk, 660036, Russia — 3Univ. Kiresky Institute of Physics RB SAs, Krasno-
ysk, 660036, Russia
Quantum chemical calculations of the elec-
tronic structure and the total energy of several pheromone molecules of Siberian moth and its re-
sponse to substances contained in forest and to electromagnetic radiation have been carried out.

THUp.BIO 7 16:30
X-ray reflectivity study of the structures
formed when DNA is attached to a flat
amino terminal surface: influence of DNA topology — • LUIGI CRISTOFOLINI1,2, OLEG KONOVALOVA3, TATIYAN BEREZINA1,2, VIC-
TOR EROKHIN1,2, and MARCO FONTANA1,2 — 1 Dipartimento di Fisica, Università di Parma, (I) and CNR- C.R.S. SOFT — 2CNR- C.R.S.
SOFT — 3European Synchrotron Radiation Fa-
cility, Grenoble (F)
By high-energy XRR and nulllepsismetry we study the interaction of DNA with solid films at the
air/water and liquid/solid interfaces, and the splitting of DNA in presence of amino-groups, showing different morphologies for linear and circ-
ular DNA of same sequence.

THUp.BIO 8 16:30
Optical Properties Of Systems Of Interest
For Photovoltaic Applications — • NICOLA SPALLANZANI1,2, CARLO ANDREA ROZZI1,2, DANIELE VARSANO2, FRANCA MANGI1,2, and ANGE
L RUBIO3 — 1Department of Physics, Uni-
versity of Modena and Reggio Emilia, Modena,
Italy — 2CNR-INFN National Research Center
S3, Modena, Italy — 3European Theoretical
Synchrotron Physics Facility (ETSF), Dpto. Fisica de Materiales, U. del Pais Vasco, Spain
This study concerns on the small air ion concen-
tration levels, known as Raman Tweezers is applied to ana-
alyze single, selected erythrocytes in their natural environment.

THUp.BIO 9 16:30
Kinetic Arrest in Polymion-Induced
Inhomogeneously-Charged Colloidal Parti-
cle Aggregation — • DOMENICO TRUZZOLILIO,
FEDERICO BORDI, FRANCESCO SCIORTINO, and
CESARE CAMETTI — Dipartimento di Fisica,
Universita’ di Roma “La Sapienza”, Piazzale A. Moro 5, I-00185 - Rome (Italy) and INFN CRS-SOFT, Unità di Roma 1
We investigate the aggregation kinetics of polymion-induced colloidal complexes through Monte Carlo simulation, the effect of charge

THUp.SUR 46 16:30
Three-terminal negative resistance induced by
electron-electron scattering: Bernoulli
effect in an electron gas — • ISMET KAYA — Sabanci University, Faculty of Engineering and Natural Sciences, 34956 Istanbul, Turkey
The experimental results for three terminal de-
vices fabricated in a 2DEG with submicron tran-
sit lengths is presented. The negative resistance
anisotropy being taken into account by a DLVO-like intra-particle potential, as recently proposed by Velegol and Thwar.

THUp.BIO.10 16:30

The Influence of the Chemical Treatment on the Keratin Structure — Silvija Sencicurović1, Yuri Zabashta1, Volodymyr Pihytupa1, and Ivan Prokhorov1,2,3,4 — Kyiv National Taras Shevchenko University, Physics Faculty, 03680, Glushkov pr. 2 kop.1, MSF-680 Kyiv, Ukraine — 1The State Forensic Center of the Ministry of Internal Affairs of Ukraine, 03170, Velyka Okruzhna vol. 4, Kyiv-170, Ukraine — 2Avtoprom Institute, 01103, Druzhby Narodiv b 28, Kyiv-103, Ukraine

Human hair was treated with thioglycic acid. Increase in second order Young’s modulus and infrared absorption bands shift corresponding to $C_H^2$ and $C_H$ vibrations found. Model of interstitial defects formation in keratin structure proposed.

THUp.BIO.11 16:30

Mapping the Free Energy landscape of CO diffusion in Myoglobin — Luca Maragliano1, Giorgia Cottone1,2, Lorenzo Cordone3,4, Eric Vanden-Euwen3,5, and Giovanni Cicotti2,3 — 1Department of Biochemistry and Molecular Biology, University of Chicago — 2DSFA Universita’ di Palermo — 3DSFA Universita’ di Palermo — 4Courant Institute of Mathematical Sciences, New York University — 5Dipartimento di Fisica, Universita’ di Roma La Sapienza

In this work, the three dimensional Free Energy landscape for the process of CO diffusion inside Myoglobin is reconstructed by using the recently introduced “single sweep method”, which allows for accurate calculations in high dimensions.

THUp.BIO.12 16:30

AFM Imaging of native plasma membrane of Xenopus laevis oocyte Purified by Ultracentrifugation — Francesco Osini1, Paolo Arbo1, Massimo Santacroce2, Massimo Marinone3, Sara Betté1, Giulo Poletti1, Vellea Franca Sacchi1, and Alessandro Lascialfari1,2,3,4 — 1Istituto di Fisiologia Generale e Chimica Biologica, Università degli Studi di Milano, Italy — 2INFN-CNR c/o Dip. di Fisica A. Volta, Università degli Studi di Pavia and CNR-INFN-S3 NRC, I-41011 Modena, Italy

AFM investigation of native plasma membrane of Xenopus laevis oocyte purified by means of ultracentrifugation on sucrose gradient has been reported. AFM topographs, collected in a physiologic buffer, have been analyzed and compared.

THUp.BIO.13 16:30

In-solution SAXS study of guanosine four-stranded helices — Paolo Mariani1, Francesco Spinuzzi1, and Francesco Federici1,2,3 — Dipartimento Scienze Applicate Sistemi Complessi, Università Politecnica Marche, Ancona, Italy

Guanosine shows the unique ability of self-assembly in aqueous solutions into stable, regular helicoidal structures. To describe the mechanism for helix formation, the d(Gp) self-assembly process has been analyzed by small angle X-ray scattering (SAXS).

THUp.BIO.14 16:30

Electronic Structure of Eumelanin in the Condensed Phase: Theory and Experiments — Federico Menci1,2,2, Margherita Borghetti1,2,2, Stefania Pagliara1,3, Alberto Verdini1,3, Albano Cossaro2, Luca Florean2,2, Alberto Morigante2,3, Carla Castellani-Cudia1, Paolo Vilhelmacci4, Andrea Goldeni4, and Ralf Gehauer2 — Dipartimento di Matematica e Fisica, Università Cattolica, via dei Musei 41, 25121, Brescia, Italy — 2CNR-TASC, IT-34012 Basovizza, Trieste, Italy — 3Dipartimento di Fisica, Università di Trieste, via Valerio 2, 34127, Trieste, Italy — 4Sincrotrone Trieste S.C.P.A., IT-34012 Basovizza, Trieste, Italy — 5ICP and INFM-Democriti, 43127, Trieste, Italy

Synchrotron radiation spectroscopies of eumelanin thin films are used to probe the electronic structure of these biomolecules in the condensed phase. The results well compare with density functional calculations of the basic monomers.
Thursday 28 August 2008

Physic Department

FRANCESCO SPINOGGI 1, SILVIA VILAS 2, GAE- TANO IRACCI 2, THYENCHERI NARAYANAS, 3 and PAOLO MARIANI 3 — Università Politecnica delle Marche, Ancona, Italy — 3Dipartimento di Biochimica e Biofisica, Seconda Università degli Studi di Napoli, Italy — European Synchrotron Radiation Facility (ESRF), Grenoble, France

We present a time-resolved SAXS study on a mutant apropyoglubin that can be considered a new and useful approach to investigate the first stages of amyloidogenic processes.

THUp.POL.2 16:30
The Effect of Hard Segment Ordering on The Crystallinity of Novel Thermoplastic Polyurethane Elastomers Based on Mixtures of Flexible and Rigid Disiocyanates — CHRISTINA PRISACARIU 1, ANDREA CARBON, 2, FRANCESCO SPINOGGI 1, SERENA MANNI 2, LUIGI FERRANTE 2, and PAOLO MARIANI 3 — Università Politecnica delle Marche, Dipartimento Scienza Applicati Sistemi Complessi, Ancona (Italy) — Università Politecnica delle Marche, Istituto di Microbiologia e Scienze Biomediche, Ancona (Italy)
The contribution has been withdrawn by the authors.

THUp.BIO.25 16:30
EPR study on paramagnetic species induced in aluminosilicate compounds by gamma ray irradiation — EMILIA VANEA, 2, FERRANTE PIERO 1, MANNI EMANUELA, 1, FILIPPO ROBERTA 1, URSO ANGELO 1, and MAFITI MICHELE 1 — Università Politecnica delle Marche, Istituto dei Sistemi Complessi, Ancona (Italy) — Università Politecnica delle Marche, Dipartimento Scienza Applicati Sistemi Complessi, Ancona (Italy)

THUp.POL.27 16:30
GISAXS investigation of surfaces functionalized with α-helices using plasma polymer deposition — THAPPALE SIBALDI, MARIA GRAZIA ORTORE, FRANCESCO SPINOGGI, and PAOLO MARIANI — Università Politecnica delle Marche, Ancona Italy

THUp.POL.30 16:30
Uncoated fiber tips for scanning near-field optical microscopy obtained by tube etching — EMILIO MEZZENGA, 1 THOMAS STRAUCH, 2 and WOLFGANG PAUL 3 — Dipartimento di Scienze Biomediache, Foggia, Italy

THUp.POL.6 16:30
Multiscale Simulations of Polybutadiene Solutions — THOMAS STRAUCH and WOLFGANG PAUL — Institute for Physics, Johannes Gutenberg-University Mainz, Germany

16:30 – 18:40
Polymer Physics - Poster Session

THUp.POL.1 16:30
Characterization of Novel Selected Polyurethane Copolymers Derived From Crystallizable Hard Segments With a Coplanar Packing — CHRISTINA PRISACARIU 1 — Institute of Macromolecular Chemistry Petru Poni, Iasi, Romania

THUp.POL.2 16:30
The Effect of Hard Segment Ordering on The Crystallinity of Novel Thermoplastic Polyurethane Elastomers Based on Mixtures of Flexible and Rigid Disiocyanates — CHRISTINA PRISACARIU 1 — Institute of Macromolecular Chemistry Petru Poni, Iasi, Romania

THUp.POL.3 16:30
Influence of the Hydrogen Bonding On The Physical-Mechanical Properties of Thermoplastic Polyurethanes Based on Hard Segments of Rigid and Variable Geometries — CHRISTINA PRISACARIU and ELENA SCORTANU 2 — Institute of Macromolecular Chemistry Petru Poni, Iasi, Romania

THUp.POL.4 16:30
Novel Polyurethane-Ureas With Dibenzyl Structures and Asymmetric Aromatic Diamines — CHRISTINA PRISACARIU and ELENA SCORTANU 1 — Institute of Macromolecular Chemistry Petru Poni, Iasi, Romania

THUp.POL.5 16:30
Novel Polyurethane Blends Based on Dibenzyl Structures and The Nano-Structural Origins of their Physical Properties — CHRISTINA PRISACARIU 1 and ELENA SCORTANU 1 — Institute of Macromolecular Chemistry Petru Poni, Iasi, Romania

THUp.POL.6 16:30
Multiscale Simulations of Polybutadiene Solutions — THOMAS STRAUCH and WOLFGANG PAUL — Institute for Physics, Johannes Gutenberg-University Mainz, Germany
We propose a new, systematic coarse-graining procedure for the nonbonded part of the interaction of a polymer taking equation of state data from atomistic simulations or experiments into account.

The optical properties and the electrical conductivity of PVA and C60 thin films were studied. The relationship between the edge electrical conductivity of PVA and C60 thin films was obtained by thermal treatment of the Cd(NO3)2, \( \text{CdS- polyvinyl composite} \) and Crystallization of Homopolymer in the Presence of Additive

**THUp.POL.10 16:30 Continuous versus first-order collapse transitions of simple, flexible homopolymers:** A Monte Carlo Simulation — **WOLFGANG PAUL**1, **FEDERICA RAMPI**2, **THOMAS STRAUCH**2, and **KURT BINDER**1 1Institut f. Physik, Johann-Baptist-Gebhard University, 55099 Mainz, Germany — 2Institut f. Mikrotechnik Mainz, Carl-Zeiss-Straße 18-20, 55129 Mainz, Germany

Using flat histogram Monte Carlo simulations of a simple, flexible homopolymer model we have shown that the collapse transition of such polymers is not necessarily continuous, as generally assumed, but can be of first order.

**THUp.POL.11 16:30 Molecular weight dependence of the crystalline-amorphous superstructure of semi-crystalline polymers:** **ALBRECHT PETZOLD**3, **THOMAS HENZE**3, and **THOMAS THURN-REHARN**1 1Institut für Physik, Martin-Luther-Universität Halle-Wittenberg, D-06099 Halle, Germany

Using SAXS the molecular weight dependence of the crystalline-amorphous superstructure of polyethyleneoxide after isothermal crystallization was studied. In contrast to predictions from common theoretical models the crystalline and amorphous layer thickness both depend strongly on molecular weight.

**THUp.POL.12 16:30 Dynamics of chains with rigid constraints:** **FRANCO FERRARI**1 and **JAROSLAV FATUREC**2 1Institute of Physics and CASA, University of Szczecin, Szczecin, Poland — 2Institute of Physics and CASA, University of Szczecin, Szczecin, Poland

The dynamics of a freely jointed chain with constraints is described with the help of a generalized sigma model. Applications to the dynamics of DNA and protein chains, as well as a comparison with the Rouse model will be presented.

**THUp.POL.13 16:30 Carbon nanotubes based devices for electromagnetic screening:** **STEFANO BELLUCCI** — INFN-Laboratori Nazionali di Frascati

We report that correlated polymer crystals of uniform size and orientation can be generated via self-seeding, because thicker regions within lamellar single crystals can resist melting and so, after cooling, act as nuclei for re-growing identical crystals simultaneously.

**THUp.POL.14 16:30 Laser Treatment for the modification of Polymeric Surface:** **VINCENTO NAZZI**1, **ANTONELLA LORUSO**1, **FABIO PALADINI**1, **ANTONINO RAIO**2, **MARIA VITTORIA SICILIANO**3, and **LUCIANO VEILANDI**4 1Department of Physics, Laboratorio di Elettronica Applicata e Strumentazione, LEAS, University of Salento, INFN, SS Lecce-Monteroni CP103, 71000 Lecce-Italy — 2Department of Physics, University of Bari, via Amendola, 173, 70126 Bari-Italy — 3Department of Material Science, University of Salento, INFN, Lecce-Italy

We studied surface modification of the Poly(methyl-nethylacrylate) and Ultra High Weight Molecular Polyethylene by UV and IR lasers. The UV laser was efficient on both polymers, while the IR induced modification only on the Poly(methyl-nethylacrylate).

**THUp.POL.15 16:30 Crystallization of Homopolymer in the Presence of Additive:** **ASHOK DAS MAHAPATRA**1, **SUBENKWAY KUMARSAWY**1, and **HEMANT NAVALATI**1 1Department of Chemical Engineering, Indian Institute of Technology Bombay, Mumbai - 400076, India — 2Polymer Science and Engineering Division, National Chemical Laboratory, Pune - 411008, India

Interplay between monomer-additive interaction and crystallization leads to a non-monotonic behavior in specific heat, unlike crystallinity and mass fraction, near phase transition. We justified our argument with monomer density fluctuation and crystallization kinetics.

**THUp.POL.16 16:30 Structure of oppositely charged polyelectrolyte complex:** **FABIO MENGARELLI**1, **LOIC AUVRAY**2, and **MEHDI ZEGHAL**1 1Laboratoire de Physique des Solides, CNRS-UMR8502, Université de Paris-Sud, Orsay, France — 2Laboratoire Matériaux Polymères aux Interfaces, Université d’Evry, 91025 Evry, France

We have obtained the phase diagram and the stability region of polyelectrolytes complexes (B/L-PEI, PMA, PdnA). We also studied structure and dynamics of aggregates within several experimental techniques (DLS, SANS, NMR, bidimetry, zeta potential).

**THUp.POL.17 16:30 Nonlinear holographic formation of photonic structures in photopolymer-based nano-composites:** **SERGEY SHABANGOVICH**1, **EUGENE DOVOLNOV**1, and **VYACHESLAV MIRGOROD**1 1Tomsk State University of Control System and Radioelectronics, 634050 Tomsk, Lenin avenue 40, Russia

We present analytical model of multibeam nonlinear holographic record of 3D photon structures in absorbent photopolymer composite materials with nanoparticles. We examined influence of the material and record parameters on 3D refraction index distribution.

**THUp.POL.18 16:30 Non-steady-state photocurrents in polypropylene nanosstructures within chrysotile asbestos matrix:** **IGOR SOKOLOV**1, **MICHAEL BRYUSHIN**1, **VICTOR SEMKIN**1, and **YURI KUMEROV**1 1A.F. Ioffe Physical Technical Institute, 194021, St. Petersburg, Russia

We report the experimental investigation of the non-steady-state photoelectromotive force in polypropylene nanosstructures within chrysotile asbestos. The diffusion length of carriers is estimated: \( L_D=0.188 \mu m \).

**THUp.POL.19 16:30 Synthesis and characterization of Poly(ethylene oxide)-capped Gold Nanoparticles combining TEM, TGA, mass and neutron scattering:** **MARCO MACARINI**1, **GIUSEPPE BRIGANTI**1, **SIMONA RUCABARE**1, **3, 4, and BRUCE LENNOX**1 1Institut Laue-Langevin, 38042 Grenoble, France — 2Universit`a di Roma “La Sapienza”, IT- 00134 Roma, Italy — 3Current address: TNO Holst Centre, 5656 Eindhoven, The Netherlands — 4Dep. of Chemistry, McGill University, Montreal, Canada

Novel synthesis of poly (ethylene glycols) stabilized gold nanoparticles will be presented. The structure and dynamics of these particle in solution were studied with density, TGA, SANS and neutron spin echo spectroscopy.
**THUp.POL.20**  16:30

Entanglement features and experimental linear viscoelastic response of polyethylene melts — **Javier Ramos** and **Javier Martín-Zalazar** — Departamento de Física Macromolecular, Instituto de Estadística de la Materia (CSIC), Serrano 113 bis, 28006 Madrid (Spain)

The study of the melt mechanical dispersion of polyethylenes has revealed strong dependences of the entanglement features with the molecular architecture. We discuss these features in the framework of the reptation model.

**THUp.POL.21**  16:30

XRD, FTIR, TEM, TSDC and DSC characterization of Polymer Nanocomposites Prepared from Montmorillonite Natural Clay — **Nery Suárez**, **Noé Salazar**, **José Luis Felio**, and **María Cristina Hernández** — Departamento de Física, Universidad Simón Bolívar, Caracas 1080, Venezuela — Departamento de Ciencia de los Materiales, Universidad Simón Bolívar, Caracas 8900, Venezuela

We have studied the morphology, molecular motions, dielectric and thermal properties of a series of polymer-clay nanocomposites, prepared by the exfoliation-adsorption technique, from water-soluble and insoluble polymers, and natural and organically modified montmorillonite.

**THUp.POL.22**  16:30

Effects of nanoscale dispersion in the dielectric properties of polymer/clay nanocomposites — **María Cristina Hernández**, **Nery Suárez**, and **José Luis Felio** — Departamento de Física, Universidad Simón Bolívar, Apartado 89000, Caracas 1080-A, Venezuela — Departamento de Ciencias de los Materiales, Universidad Simón Bolívar, Apartado 89000, Caracas 1080-A, Venezuela

We investigate the effects of clay proportion and nanoscale dispersion in dielectric response of Poly(vinyl alcohol)/ Bentonite nanocomposites. Investigations include the effects of polymer-clay interactions through the formation of hydrogen bounds.

**THUp.POL.23**  16:30

Generalized non-linear sigma model applied to the dynamics of a random chain with rigid constraints — **Jarek Lawrynek** and **Franco Ferrari** — Institute of Physics and CASSA*, University of Szczecin, Poland

In this contribution a model of the dynamics of a fluctuating freely jointed chain immersed in a thermal bath is considered. This description, unlike standard approaches, takes into account rigid constraints which forbid the breaking of the chain.

**THUp.POL.24**  16:30

Monte Carlo simulations of supramolecular polymer self-assembly with patchy particles — **Bastiaan A. H. Huismans**, **Peter G. Bolhuis**, and **Annalisa Fasolino** — 1Van ’t Hoff Institute for Molecular Sciences, University of Amsterdam, Nieuwe Achtergracht 166, 1018 WV Amsterdam, The Netherlands — 2Institute for Molecules and Materials, Radboud University Nijmegen, Heyendaalseweg 135, 6525 AJ Nijmegen, The Netherlands

We use patchy particles with directional interactions to simulate the self-assembly of monomers into supramolecular fibers. We find a first-order phase transition from fluid to solid bundles for which we present a phase diagram.

**THUp.POL.25**  16:30


Electronic transport and optical properties of semiconducting polyvinylidene-chloride copolymers in thin films are investigated. These properties are discussed in correlation with the molecular structure, which affords an extended conjugation of the electrons.

**THUp.POL.26**  16:30

Diblock Copolymer Self Assembly — **Barbara Caponi**, **Jean-Pierre Hansen**, **Carlo Pierleoni**, and **Vincent Krakovitch** — 1Department of Chemistry, University of Cambridge, Cambridge CB2 1EW, United Kingdom — 2INFN CRS-SOFT, and Department of Physics, University of L’Aquila, I-67010 L’Aquila, Italy — 3Laboratoire de Chimie, École Normale Superieure de Lyon, 6934 Lyon Cedex 07, France

We investigate the self-assembly of diblock-copolymers in a selective solvent. From a microscopic model we investigate the self-assembly of a semi-dilute solution of A-B diblock copolymers into polydispersive micelles.

**THUp.POL.27**  16:30

Chain conformations and structure development in electrospun fibres of polymers — **Saeed Mojab**, **Suat Sen**, **Delyth Elliott**, **Fred Davis**, **Mahadevappa Karduraganavar**, **Geoffrey Mitchell**, and **Robert Oliver** — 1Polymer Science Centre, University of Reading, Whitley, Reading, RG6 6AF UK — 2Department of Chemistry, Karnatak University, Dharwad 580 003, India

We use small-angle neutron scattering techniques with labelled mixtures of polymers to quantify the details of the chain conformations in nanoscale electrospun fibres including the level of preferred orientation and their relationship with spinning conditions.

**THUp.POL.28**  16:30

Influence of Electric Fields on the Phase Behavior of Concentrated Block Copolymer Solutions — **Heiko Schoberth**, **Kristin Schmidt**, and **Alexander Böker** — Universitäts Bayreuth, Bayreuth, Germany

We investigate the influence of the electric field on the order-disorder transition temperature of diblock copolymer in concentrated solutions using Synchrontron SAXS. In addition we show reversible order-disorder transitions induced by electric fields.

**THUp.LIQ.2**  16:30


Investigating nanosized undercooled liquids by x-ray absorption and diffraction techniques — **Emiliano Principi**, **Marco Minicucci**, **Giorgio Greco**, **Luca Olivi**, **Massimo Centazzo**, **Konrad Trzebiatowski**, **Agnieszka Witkowski**, **Angela Trapanat**, **Giuliana Aquilanti**, and **Andrea Di Ciocco** — 1CNISM, CNR-INFM SOFT and Dipartimento di Fisica, Universita di Camerino via Madonna delle Carceri, I-62032 Camerino (MC) Italy — 2ELETTRA - Sincrotrone Trieste S.p.A. Strada Statale 14 - km 163,5 in AREA Science Park 38043 Basovizza, Trieste ITALY — 3Department of Solid State Physics, Gdansk University of Technology, 80-952 Gdansk, Poland — 4European Synchrotron Radiation Facility, 8 rue Jules Horowitz, Bte Postale 220, 38043 Grenoble Cedex, France

Two step coarse grain analysis of the entropical self-assembly of diblock-copolymers in a selective solvent.

**THUp.LIQ.3**  16:30

Nonlinear Optical Susceptibility of Out-of-Equilibrium Colloidal Dispersion — **Veda Ghofraniha**, **Claudio Conti**  and **Giorgio Ferrari** — 1Polymer Science Centre, University of Reading, Reading, RG6 6AF UK — 2Department of Chemistry, Karnatak University, Dharwad 580 003, India

Stable and metastable liquid structure of nanosized undercooled liquids has been investigated combining x-ray absorption spectroscopy and angular dispersive x-ray diffraction. Structural and phase transition anomalies revealed in the structural and physical properties are discussed.
We consider a system of interacting particles subjected to gravity, which results in a change in the dynamics of the system. The Oli model pseudopotential is used to calculate the thermodynamic properties of Fe, Co, and Fe-Co melts in the framework of the thermodynamic perturbation theory.

### THUp.LIQ.8

**Colloidal Volumes of Coexisting Phases by Free Energy Minimization**

**Guanfei Wang** and **Sankiong Lai**

Complex Liquid, Department of Physics, National Central University, Chungli, Taiwan.

Colloidal coexisting phases are treated as a composite system whose free energy density is written as the fractional volume average of its constituent free energy densities. Minimizing this density yields the domains of coexisting phases.

### THUp.LIQ.9

**Water structure and dynamics in aqueous solutions of sugars by depolarized light scattering**

**Leonida Fioritto**\(^1\), **Francesco Iannantuoni**\(^2\), **Maria Elena Gallina**\(^3\), **Paola Sassì**\(^4\), **Anna Morri**\(^5\), and **Filippo Scarponi**\(^1\)

\(^1\) Dipartimento di Fisica, Università di Roma “La Sapienza”, 00185, Roma, Italy — **Research Center “Enrico Fermi”, Via Panisperna 89-A,00184 Rome, Italy — **Soft-Infn-Cnr, Università di Roma “La Sapienza”, P.A. Moro 2, 00185, Roma, Italy — **Laboratoire de Physique Théorique, Ecole Normale Supérieure,24 Rue Lhomond, 75231 Paris Cedex 05, France.

Liquid macromolecules near the critical state become inhomogeneous due to gravity effect. Nevertheless, the thermal motion in nano-scaled systems decreases the action of gravity field. The system size effect is observed. It is shown that in the case of the particular asymmetry, characteristic sequence of the two phase transformations of different origins is observed.

### THUp.LIQ.10

**Picoscend dynamics of molecular liquids as a probe of long-living dimer geometries**

**Ubaldo Bapst**\(^1\), **Fabrizio Barocchi**\(^1,2\), **Eleonora Guarnieri**\(^2\), **Marco Sampoli**\(^2,3\), and **Giovanni Venturi**\(^4\)

\(^1\) CNR Istituto di Sistemi Complessi, sezione di Firenze, Firenze, Italy — **Dipartimento di Fisica, Università di Firenze, Firenze, Italy — **Dipartimento di Energetica, Università di Firenze, Firenze, Italy — **CNR-INFM and CRM Soft, c/o Dipartimento di Fisica, Università La Sapienza, Roma, Italy.

Using molecular dynamics, we examine the electronic and optical spectra of formamide in solution, obtained with different approaches: Density Functional Theory, Green’s function theory and DTDDFT.

### THUp.LIQ.11

**Excited states properties of formamide in water-driven phase transitions**

**Viviana Garbujo**\(^1\), **Michela Cascella**\(^2\), **Rodolfo Del Sole**\(^1\), and **Olivia Pulci**\(^1\)

\(^1\) ETH, SMC-INFM-CNR and Physics department, University of Rome Tor Vergata, 00133 Rome, Italy — **Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland.

We present the electronic and optical spectra of formamide in solution, obtained with different approaches: Density Functional Theory, Green’s function theory and TD-DFT.

### THUp.LIQ.12

**Collective Modes in Phonon Pulses in Superfluid 4He — Igor Adamenko**

**Igor Adamenko** — Kyiv National Taras Shevchenko University, Physics Department, Prosp. Glushkova, 2, build. 1, Kyiv 03022, Ukraine.

The features of macro-inhomogeneous fluids under gravity near the critical point have been compared with the properties of nano-systems near the critical point; the shifts of the critical parameters for nano-system have been calculated.

### THUp.LIQ.13

**Neutron inelastic scattering and molecular dynamics simulations on simple molecular liquids reveal the existence of pair structures living on the picosecond time scale and depending on the interaction anisotropy and energy.**

**Leonid Son** and **Nikolay Vatolin**

**Leonid Son** — Kyiv National Taras Shevchenko University, Physics Department, Prosp. Glushkova, 2, build. 1, Kyiv 03022, Ukraine.

It has been revealed that the heat capacity of inhomogeneous liquid has nonmonotonic temperature and field dependences. The equations for these extremes have been derived on the basis of the "linear model".
A general microscopic approach to the study of heterogeneous nucleation phenomenon based on the classical nucleation theory — ANDREY SARIKOV — V. Lashkarev Institute of Semiconductor Physics NAS Ukraine, 45 Nauki avenue, Kiev 03028, Ukraine

In this work, the microscopic approach to the study of heterogeneous nucleation and interface nucleation in the supersaturated solutions is suggested based on the classical nucleation theory.

Description of supercooled liquids and glasses in the model of detected states of bond orientation order — MIKAIL VASIN — Physical-Technical Institute, Ural Branch of Russian Academy of Sciences, 132 Kirov st., 426000 Izhevsk, Russia

Basic properties of the supercooled liquids and glasses are sequentially described in the framework of single theory based on the model of detected states of bond orientation order.

Nucleation and growth in a phase-field model using cell dynamics system from the classical nucleation regime to the spinodal regime — MASAO IWAMATSU — Musashi Institute of Technology, Tokyo 158-8557, Japan

In this paper, we use the two-dimensional phase-field model with cell dynamic system to study the kinetics not only of the nucleation but also the growth from classical nucleation to spinodal regime.

\textbf{THUp.QI.19} 16:30

\textbf{A general microscopic approach to the study of heterogeneous nucleation phenomenon based on the classical nucleation theory — ANDREY SARIKOV — V. Lashkarev Institute of Semiconductor Physics NAS Ukraine, 45 Nauki avenue, Kiev 03028, Ukraine}

\textbf{THUp.QI.20} 16:30

\textbf{Description of supercooled liquids and glasses in the model of detected states of bond orientation order — MIKAIL VASIN — Physical-Technical Institute, Ural Branch of Russian Academy of Sciences, 132 Kirov st., 426000 Izhevsk, Russia}

\textbf{THUp.QI.21} 16:30

\textbf{Nucleation and growth in a phase-field model using cell dynamics system from the classical nucleation regime to the spinodal regime — MASAO IWAMATSU — Musashi Institute of Technology, Tokyo 158-8557, Japan}

\textbf{THUp.QI.22} 16:30

\textbf{Optical-visibility features of the Al-Ni (up to 10 at. % of Ni) melts — VLADIMIR LAD’YANOV, SVETLANA MEN’SHIKOVA, and ANATOLIY BEL’T’YUKOV — Physical-Technical Institute, Ural Branch of Russian Academy of Sciences, 132 Kirov st., 426000 Izhevsk, Russia}

\textbf{THUp.QI.23} 16:30

\textbf{Characterisation of Refractive Index for Singlelayer and Multilayer Chalchogenide Thin Films — SVETLANA LUKIC, MIJLANA SILJEGOVIC, DRAGOSLAV PETROVIC, and LJUBICA DJACANIN — Faculty of Sciences, Novi Sad, Serbia}

\textbf{THUp.QI.24} 16:30

\textbf{Cation-substitution optimization effects in chalcogenide glasses — OLEH SHOTYUK, MIHAUL IOVU, MYKOLA VAKI, YAROSLAV SHOTYUK, ROMAN GOLOVCHAK, and TARAS KAVETSKYI — Liviu Institute of Materials of SRC Carat, 202, Strijykska str., Liv., UA-79001, Ukraine}

\textbf{THUp.QI.25} 16:30

\textbf{Kinetics-descriptive algorithm for photo-soaked relaxation in amorphous chalcopyrite films — VALentina BALITSKA, MIHAUL IOVU, and OLEH SHOTYUK — Liviu Institute of Materials of SRC Carat, 202, Strijykska str., Liv., 79001, Ukraine}

\textbf{THUp.QI.26} 16:30

\textbf{Thermodynamics and structural properties of aqueous sodium chloride solutions upon supercooling — DARDO CORRADO, PAOLA GALLO, and MAURO ROVERE — Dipartimento di Fisica, Universita “Roma Tre”, Via della Vasca Navale 84, I-00146 Roma, Italy}

\textbf{THUp.QI.27} 16:30

\textbf{Four-phonon relaxation in isotropic and anisotropic phonon systems of super-fluid helium — IGOR ADAMENKO, YURY KISENKO, KONSTANTIN NIKITIN, and ADRIAN WYATT — Karazin Kharkov National University, Suvorov sq, 4, Kharkov, 61077, Ukraine}

\textbf{THUp.QI.28} 16:30

\textbf{High-frequency acoustic modes in glasses and their relation to the thermal conductivity: an inelastic x-ray scattering study — GIULIO MONACO — European Synchrotron Radiation Facility, Grenoble, France}

\textbf{THUp.QI.29} 16:30

\textbf{Fluctuation theorems for an anharmonically bound Brownian particle — ROMERO R. DEZA, GONZALO G. LEVI, and HORACIO S. WOO — Universidad Nacional de Mar del Plata, Argentina}

\textbf{THUp.QI.30} 16:30

\textbf{Simulating the Langevin Dynamics of Hard Spheres — ANTONIO SCALA and THOMAS VOGTBECK — Dipartimento di Fisica and INFN-CRS SMC, Univ. di Roma “La Sapienza”, P.le Aldo Moro 2, 00185 Roma, Italy}

\textbf{THUp.QI.31} 16:30

\textbf{Transport coefficients preliminary evaluation in diverse materials during the glass transition — ENRIQUE LEMUS-Fuentes — Universidad Tecnologica de la Mixteca, Huajuapan de Leon, Oax, Mexico}

\textbf{THUp.QI.32} 16:30

\textbf{Defect Nucleation and Defect Formation in Solid Xe Induced by Synchrotron Radiation — ALEXANDER N. OGURTSOV, NATALIA YU. MASALITINA, and OLGA N. BLIZNUK — National Technical University “Khit”, Kharkov, 61002, Ukraine}

\textbf{THUp.QI.33} 16:30

\textbf{Engineering the Spin Dynamics in Time-Dependent Spintronics — ANDREA ANI LUCA STEFANUCCI, ENRICO PERFETTO, and ULISE STEFANUCCI — Università di Firenze, Italy}
The condensation fraction of bosonic system is studied within the static fluctuation approximation. The condensation fraction of bosonic system with potential model is investigated. It is shown that the melting line of the system demonstrates maxima. The water-like anomalies are found near the minimum on the melting line.

The interaction between charged macroions induced — Klemen Bohinc

Elastic properties and ultrasonic attenuation for the Zr_{57}Ti_{43}Cu_{7}Sn_{44}Ag_{18} bulk metallic glass under hydrostatic pressure up to 1 GPa — Valentin Ryzhov, Anatoliy Zatsepin, and Andrea Giugni

Elastic properties, equation of state and attenuation of longitudinal and transverse ultrasonic waves for Zr_{57}Ti_{43}Cu_{7}Sn_{44}Ag_{18} bulk metallic glass was measured under pressure up to 1 GPa. Several times lower values of attenuation were obtained than expected.

Dynamics of uniaxial hard ellipsoids: orientational glass transition driven by elongation — Cristiano Di Michele, Rolf Scrocco, and Francesco Sciortino

Dynamics of uniaxial hard ellipsoids: orientational glass transition driven by elongation.

Phase diagram, anomalous behavior and quasi-binary amorphous phase in a 3D system of particles with repulsive-shoulder interaction — Valentin Ryzhov, Yury Fomin, and Nadezhda Gribova

Phase behavior of the system with repulsive step potential is investigated. It is shown that the melting line of the system demonstrates maxima. The water-like anomalies are found near the minimum on the melting line.
We demonstrate the presence of chemical short-range order in Mg-Ti-H thin films by combining EXAFS and theoretical modeling of the hydrogen absorption isotherms. The short-range order is responsible for the exceptional properties of these materials.

Glass-forming clusters and self-organization effects in covalent-bonded glass formers — Vitaliy Boyko, Malgorzata Hyla, and Yaroslav Shipotyr — Liviv Sci.&Res. Institute of Materials of SRC, Lviv, Ukraine — Institute of Physics of Jan Dlugosz University, Czestochowa, Poland — Ivan Franko National University of Lviv, Lviv, Ukraine

We carry a computer simulation of microstructure formation of ferrofluid. Especially considering the rotating field effect, and obtain layering structures in various ranges of the rotating frequency and packing density.

Shear thickening and glass transition in molecular solutions characterized by inverse melting — Roberta Angelini — Research center SOFT INFM-CNR, University of Rome “La Sapienza”

We report new measurements of the LA attenuation in vitreous silica in the crucial frequency region below 1THz using a picosecond optical technique.

Critical behaviour of athermal mixtures in the presence of quenched disorder — Pier Giorgio De Sanctis Lucentini and Giuseppe Pellicane — Università di Roma La Sapienza, P.Le Aldo Moro 2, IT-00185 Roma, Italy — Università degli Studi di Messina, Dip. Fisica, IT-98166 Messina, Italy

The critical properties of a symmetrical, binary athermal mixture in a random matrix are investigated via Semi-grand ensemble Monte Carlo simulations.
We show that the field-induced diffusion of adsorbrates to the probe tip can change the magnetic resolution in the experiments by nearly one order of magnitude, and that the tip field will change the Kondo temperature of a single magnetic impurity in a continuous manner during its approach.

Controlling an atomic scale machine by Scanning Tunneling Microscope — •Ahmadih Saeid, Arle van Houselt, Bente Poeselsem, and Harold Sandvliet — Solid State Physics Group and MESA+ Institute for Nanotechnology, University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands

Single-photon generation in superconducting nanocircuits via adiabatic passage — •Giuseppe Mangano1,2, Jens Siwert2, and Giuseppe Falc1 — 1Matis CNR-Infm & Dipartimento di Metodologie Fisiche e Chimiche per l’Ingegneria (DMFCl), Università di Catania, I-95125 — 2Institute für Theoretische Physik, Universität Hamburg, Germany

Directing the Crystallisation of Polymers using Additives — •Geoffrey Mitchell1, Fred Davis1, Robert Olle1, and Supatra Wongsoung1,2 — 1Polymer Science Centre, University of Reading, Whiteknights, Reading RG6 6AF UK — 2Department of Chemistry, Naresuan University, Phitsanulok 65000 Thailand

Oxford Instruments Nanoscience developing the next generation of cryogen-free superconducting magnet and ultra-low-temperature equipment. — •Andrea Catal-Famo — Oxford Instruments Nanoscience, Oxfordshire, UK

Friday 29 August 2008

22nd General Conference of the Condensed Matter Division of the European Physical Society · Friday 29 August 2008

Aula Magna

8:40 – 10:00
FR1M: Surface, Interface and Low-Dimensional Physics - Electronic Properties and Surface Structure
Chair: S. Fabris, CNR-INFM Democritos and Scuola Internazionale Superiore di Studi Avanzati, Trieste, Italy

FR1M.1 (Invited) 8:40
Dynamic Processes Observed by Scanning Tunnelling Microscopies: Conformation Changes, Diffusion and Vibrations — •Werner A. Hofer — The University of Liverpool, Surface Science Research Centre, Liverpool, United Kingdom

We show that the field-induced diffusion of adsorbates to the probe tip can change the magnetic resolution in the experiments by nearly one order of magnitude, and that the tip field will change the Kondo temperature of a single magnetic impurity in a continuous manner during its approach.

Aula Amaldi

8:40 – 10:00
FR1A: Semiconductor Physics - Quantum Optics
Chair: G. Bastard, LPA-ENS 24 Paris, France

FR1A.1 (Invited) 8:40
Nano-photonic devices for quantum information technology — •Andrew Shields — Toshiba Research Europe, Cambridge, UK
I describe recent progress on using single quantum dots as quantum light sources, such as triggered emitters of single photons or entangled pairs. Entanglement fidelities exceeding 90% are demonstrated allowing violation of Bell’s inequality.

Aula Convesi

8:40 – 10:00
FR1C: Joint Biological Physics & Life Sciences and Polymer Physics XI
Chair: D. Vlassopoulos, Institute of Electronic Structure and Laser, Heraklion, Crete, Greece

FR1C.1 (Invited) 8:40
Laws Controlling Crystallization and Melting in Bulk Polymers — •Gert Strobl — Physikalisches Institut, Universität Freiberg, 7900 Freiburg, Germany
Experiments carried out during the last decade revealed several laws which control polymer crystallization and melting in bulk. The observations indicate that the pathway followed in the growth of polymer crystallites includes an intermediate mesomorphic phase.

Aula 1

8:40 – 10:00
Talks from Exhibitors
Chair: J. Cinquetti, Cinquespascal srl, Milano, Italy

The European Physical Journal (EPJ): Genesis and modern developments — •Christian Caron — Springer - Verlag, Berlin, Germany
A brief overview of The European Physical Journal (EPJ), co-published by the Italian and French Physical Societies, and Springer, as joint initiative to develop and expand a leading international physics journal out of Europe. More specifically, the aims, scope and Editorial Policy of The European Physical Journal B - Condensed Matter and Complex Systems, are presented.

8:50
Springer - Your Physics Publisher — •Maria Bellantone — Springer - Verlag, Berlin, Germany
Introduction to our publishing company including; brief history, mission statement. Followed by an overview of our Physics publications, our print and online services for Physics readers and authors, our key contact persons. Then highlighting some specific Physics products and showing their features.

9:00
EPL (the new branding of Europhysics Letters) and Journal of Physics Condensed Matter (an overview) — •Philip Semple — IOP Publishing, Bristol, UK

9:10
EPL (the new branding of Europhysics Letters) and Journal of Physics Condensed Matter (an overview) — •Graeme Watt — IOP Publishing, Bristol, UK

9:20
Oxford Instruments Nanoscience developing the next generation of cryogen-free superconducting magnet and ultra-low-temperature equipment. — •Andrea Catal-Famo — Oxford Instruments Nanoscience, Oxfordshire, UK
### Aula 3

**FRI1F3: Magnetism - Magneto Electronics Materials I**  
Chair: M. Ausloos, SUPRATECS, Liège, Belgium

- **FRI1F3.1 (Invited) 8:40**  
  Coupling between magnetic and dielectric properties in insulating transition metal oxides.  
  - Antoine Maignan, Natalia Bellido, Bohdan Kundys, Christine Martin, and Charles Simon — Laboratoire CRISMAT, CNRS/ENSICAEN, 6 boulevard du Maréchal Juin, 14050 Caen cedex 4 - FRANCE

### Aula 4

**FRI1F4: Superconductivity and Highly-Correlated Systems - High Tc Superconductivity and Quantum Criticality I**  
Chair: M. D’Astuto, Université Pierre et Marie Curie, Paris, France

- **FRI1F4.1 (Invited) 8:40**  
  Magnetic excitations measured by high resolution $L_3$ edge RIXS in cuprates and in NiO.  
  - Giacomo Ghiringhelli — Politecnico di Milano, Italy

### Aula 6

**FRI1F6: Physics of Socio-Economic and Complex Systems - Self-Organization in Socio-Economic Systems**  
Chair: J. Roschard, University of Würzburg, Würzburg, Germany

- **FRI1F6.1 (Invited) 8:40**  
  Spectroscopic evidence of quantum critical charge and spin fluctuations in cuprates —  
  - Tilman Enss, Sergio Caprara, Carlo Di Castro, and Marco Grilli — 1Physik Department T34, Technische Universität München, Garching, Germany — 2SMC-INFM and Dipartimento di Fisica, Università di Roma “Sapienza”,

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**FRI1F3.2 9:20**  
Stability conditions of the cluster spin glass states in the spinels CuCr$_2$X$_4$ (where X=S, Se) doped by the Sb ions —  
- Józef Krok-Kowalski, Jerzy Warchewski, Paweł Gusin, Grzegorz Urban, Grzegorz Władarz, and Paweł Rduc — University of Silesia, Institute of Physics, ul. Uniwersytecka 4, PL-40-007 Katowice

**FRI1F4.2 9:20**  
Spectroscopic evidence of quantum critical fluctuations in cuprates —  
- Tilman Enss, Sergio Caprara, Carlo Di Castro, and Marco Grilli — 1Physik Department T34, Technische Universität München, Garching, Germany — 2SMC-INFM and Dipartimento di Fisica, Università di Roma “Sapienza”,

**FRI1F6.2 9:20**  
Multifractal interevent time statistics in socio-economic systems: The financial trading case —  
- Josep Perelló, Jaume Masoliver, and Andrzej Kasprzak — 1Departament de Física Fonamental, Universitat de Barcelona, Spain — 2Faculty of Physics, Warsaw University, Poland
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A new atomic configuration has been found on a Pb modified Ge(001) surface by STM which acts similar to a pinball machine consisting of a pair of diners functioning as its flippers.

**FR1A.3** Photon interference from noisy solid-state devices — *Ahsan Nazir* and *Sean Barrett*

*Department of Physics and Astronomy, University College London, Gower Street, London WC1E 6BT, U. K. — 2Centre for Quantum Dynamics and Centre for Quantum Computer Technology, Griffith University, Brisbane, Queensland 4111, Australia — 3Blackett Laboratory, Imperial College London, Prince Consort Road, London SW7 2BW, U. K.*

We study the effects of dephasing environments on a pair of solid-state single photon sources, finding that they induce a loss of indistinguishability in the photon emission that can be rectified by post-selection.

**FR1B.3** Transition from diffusive to localized in 2D random laser — *Patrick Serhai* and *Christian Vanneste* — CNRS, Nice, France

We explore the transition from extended to localized modes in random optical media with increasing scattering contrast by introducing gain and pumping the first lasing mode. A possible scenario for the transition is proposed.

**FR1C.3** Langevin Dynamics of the Early Crystallization Stages of a Single-Chain Polyethylene Model Containing Main Chain Defects — *Javier Martinez-Salazar* and *Javier Ramos* — Instituto de Estructura de la Materia, Serrano 113bis, 28006 Madrid, Spain.

We present Langevin dynamics simulations of polyethylene models concerning the molecular mechanisms involved in the formation of ordered structures during the early stages of crystallization from an amorphous random coil to a folded structure.

**FR1D.1** Control of the morphology, organization and optical response of silver nanoparticles by using capping-layer effects and nanostructured surfaces — *David Lantiat*, *David Barbonneau*, *Sophie Camello*, *Lionel Simonot*, *Frédéric Pailloux*, and *Marie-Françoise Denanot* — Laboratoire de Physique des Matériaux, UMR CNRS 6630, Futuroscope, France

Our work is focused on the study of the influence of capping-layer effects and nanostructured surfaces on the structural and optical properties of silver nanoparticles.
Analysis based on de Almeida-Thouless theory. The temperature range of this stability was determined as function of antimony concentration. A finite but very low external magnetic field to keep this stability has been found.

**Unconventional antiferromagnetism and magnetoresistance in lightly-doped La$_2$CuO$_4$.**

- A. Benfatto$^1$, A. Marcella Silva Neto$^1$ — Centro Studi e Ricerche “Enrico Fermi”, via Panisperna 89/A, I-00184, Rome, Italy — University of Rome “La Sapienza”, P.le Aldo Moro 5, I-00185, Rome, Italy — Instituto de Teoria e Fisica Fundamental, UFRGS, Porto Alegre, RS, Brazil

The complete Fermi surface of Sr$_2$Ru$_2$O$_7$ has been determined by high-resolution angle-resolved photoemission. The data give clear evidence for van Hove singularities in the quasiparticle density of states on the natural energy scale of magnetism.

The temperature range of this stability was determined as function of antimony concentration. Analysis based on de Almeida-Thouless theory.

**Charge-density-wave features of tunnel conductance for junctions involving high-T$_c$ oxides.**

- Toshikazu Ekino$^1$, Alexander M. Garovich$^2$, Mai Suau Li$^3$, Mark Pekala$^4$, Henryk Szymczak$^5$, and Alexander I. Voitenko$^1$

The Kondo-lattice model is used to describe the influence of moment disorder on magnetic stability in dilute ferromagnetic semiconductors, spin-polarized tunnel currents through insulating ferromagnetic films, and interlayer exchange coupling in local moment multilayer systems.

**Josephson Junctions as a Prototype for Synchronization of Nonlinear Oscillators: from the Kuramoto Model to the Utility Power Grid System.**

- Giovanni Filatrella$^1$, Niels F. Pedersen$^2$, and Arne H. Nielsen$^3$ — CNR-INFM SuperMat Salerno and Dep. of Biological and Environmental Sciences, Univ. Sannio, Via Port’Arsa 11, I-82100 Benevento, Italy — 2OERSTED-DTU, Section of Electric Power Engineering, The Technical University of Denmark, DK-2800 Lyngby, Denmark

The analysis of synchronization of Josephson junctions has led to a modification of the Kuramoto model. The features embodied are generic and shared by other systems, such as the utility power grid.
New Lights on Correlations in High $T_c$ Superconductors: the First Application of Gutzwiller Approximation to Auger Transitions — SIMONA UGENTI1,2, MICHELE CINI1,2, GIUSEPPE LORI4, GOTZ SEUFER4, ENRICO PERFETTO2–5, and GIANLUCA STEFANUCCI1,2 — 1Dipartimento di Fisica, Università di Roma “Tor Vergata”, Via della Ricerca Scientifica 1, 00133 Rome, Italy — 2Istituto Nazionale di Fisica Nucleare – Laboratori Nazionali di Frascati, Via E. Fermi 40, 00044 Frascati, Italy — 3SMC-INFN, ISC-CNR, Dipartimento di Fisica, Università di Roma “La Sapienza”, P. Aldo Moro 2, I-00185 Rome, Italy — 4Institut für Physik, BTU Cottbus, P.O. Box 101344, 03013 Cottbus, Germany — 5Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, Via Cozzi 53, 20125 Milano, Italy.

In this work we show the first application of the recently developed Time Dependent Gutzwiller’s Approximation to the computation of the dynamical two particle response function describing Core-Valence-Valence Auger transitions from CuO$_2$ planes.

Surface compositional profiles of In(Ga)As quantum rings on GaAs(001) — STEFAN HEUN1,2, GIORGIO BIASIO2, RITA MAGNI3, ANDREA LOCATELLI4, TEVFIK ONUR MENTES4, and LUCIA SORBA1 — 1NEST INFN-CNR and Scuola Normale Superiore, I-56126 Pisa, Italy — 2Laboratorio Nazionale TASC, INFN-CNR, AREA Science Park, I-34012 Trieste, Italy — 3S3 INFN-CNR and Università di Modena e Reggio Emilia, I-41100 Modena, Italy — 4Sincrotrone Trieste S.C.p.A., I-34012 Trieste, Italy.

Composition maps of In(Ga)As/GaAs quantum rings obtained by XPEEM reveal a non-uniform profile with In-rich core. VFF calculations predict a preference for In to remain in the ring center, in agreement with the experimental findings.

A stochastic approach to transport in potassium ion channels — ENRIQUE ARADI1,2, JOHN J. KOZAK3, PHILLIP FOWLER4, and MARK S. P. SANSON1 — 1Structural Bioinformatics and Computational Biochemistry Unit, Department of Biochemistry, University of Oxford, South Parks Road, Oxford OX1 3QU, United Kingdom — 2Centre for Nonlinear Phenomena and Complex Systems, Université Libre de Bruxelles, Campus Plaine, C.P. 231, B-1050 Brussels, Belgium — 3DePaul University, 243 South Wabash Avenue, Chicago IL 60604-231, USA.

Our stochastic model shows that under physiological conditions transport rates in a potassium ion channel approach the limit of freely diffusing uncharged particles, thereby providing quantitative support for a recent hypothesis by MacKinnon et al.
were calculated for junctions involving inhomogeneous superconductors with charge density waves. TCVC reveal dip-hump structures at low temperatures, T, and pseudogap features at higher T. Results agree with TCVC for cuprates.

**FRI2F3.2 10:50**

Antiparallel magnetic coupling across a ferromagnet-diluted magnetic semiconductor interface: Fe/GaMnAs — Francesco Maccherozzi, Matthias Sperl, Christian Back, Giancarlo Panaccione, Giorgio Rossi, and Werner Wegscheider — 1Soleil Synchrotron, L’Orme des Merisiers, Saint Aubin 91192, France — 2Institut fur Experimentelle Physik, Univ. Regensburg, D-93040 Regensburg, Germany — 3Laboratorio Nazionale TASC, INFN-CNR, in Area Science Park, S.S. 14, Km 163.5, I-34012, Trieste, Italy

We will show an XMCD/XAS study proving the existence of an antiparallel magnetic coupling across the Fe/(GaMn)As interface, extending up to and above room temperature.

**FRI2F3.3 11:10**

Manganite La0.67Sr0.33MnO3 (LSMO) studied by first principles calculations — Giuseppe Colizzi, Alessio Filippetti, Fabrizio Cossu, and Vincenzo Fiorentini — SLACS-INFM-CNR, Sardinian Laboratory for Computational Material Physics

First-principles calculations have been performed for La0.67Sr0.33MnO3. A strong competition of AF phases vs. FM was found under compression and JT distortions favour it. Thus under compression double exchange (DE) weakens not strengths.
Origin of the decoherence in the Integer Quantum Hall Regime — •Preden Rouleau1, Fabien Portier1, Antonela Cavanna2, Giancarlo Faini2, Ulf Gennser2, Dominique Mailly3, and Patrice Roche3 — 1CEA Saclay, Service de Physique de l’État Condensé, Nanoelectronic group, F-91191 Gif-sur-Yvette, France — 2CNRS, Laboratoire de Photonique et Nanostructures, Phynano team, Route de Nozay, F-91460 Marcoussis, France

An electronic Mach Zehnder interferometer is used in the IQHE regime at filling factor 2, to study the dephasing of the interferences.

Suppression of nonlinear losses in oligophenyl nanofiber films under laser action — •Francesco Quochi1, Michele Saba1, Fabrizio Cordella1, Agnieszka Gocalinska1, Riccardo Corpino3, Marco Marceddu1, Alberto Amedda1, Andrea Angellucci2, Helmut Sitter3, Niyazi Serdar Sariciftci4, Andrea Mura1, and Giovanni Bongiovanni1 — 1Dipartimento di Fisica, Università di Cagliari, I-09042 Monserrato (CA), Italy — 2Institute of Physics, University Leoben, A-8700 Leoben, Austria — 3Institute for Semiconductor and Solid State Physics, University Linz, A-4040 Linz, Austria — 4Institute for Organic Solar Cells (LIOS), Physical Chemistry, University Linz, A-4040 Linz, Austria

We investigate laser action in self-assembled oligophenyl nanofibers under optical excitation. At cryogenic temperatures, we demonstrate suppression of nonlinear losses and two orders of magnitude improvement in lasing thresholds with nanosecond pulsed excitation.

Steady-State Chemotactic Response in E. coli — •Yariv Kafri — Technion, Haifa, Israel

E. coli maneuvers to high chemoattractant concentrations by performing ‘runs’, and ‘tumbles’. We account for temporal correlations and variable tumbling durations. A range of behaviors obtains, that depends subtly upon several aspects of the system.

Quantum confinement effects on the electronic and optical properties of Ge nanocrystals — •Margherita Marsili1,2, Silvana Botti3,4, Hansj. Weissker1,3, Olivia Pulci1,2, Rodolfo Del Sole1,2, Manuela Scarselli2, Paolo Castucci2, Maurizio De Crescenzi2, Jürgen Furrheimer1,4, Stefano Ossicini5, and Maurizia Palummo1,2 — 1European Theoretical Spectroscopy Facility (ETSF) — 2INFM, NAST and Dipartimento di Fisica dell’Universität di Roma Tor Vergata, I-00133 Roma, Italy — 3Laboratoire des Solides Irradiés, CNRS-CEA, Ecole Polytechnique, Palaiseau, France — 4IFTF, Friedrich Schiller Universität Jena, Germany — 5CNR-INFM-S3 and Dipartimento di Scienze e Metodi dell’Ingegneria, Università di Modena e Reggio Emilia, I-42100 Reggio Emilia, Italy

We study, within many-body-perturbation theory, the electronic and optical properties of different Ge nanocrystals. We compare the results to recent experimental data concerning the electronic gap and the photocurrent spectra of Ge nanocrystals.
Exchange atomic displacements in rare-earth hexaborides — Mehdi Amara and Rose-Marie Galera — Institut Neel, CNRS/ UJF, 25 avenue des Martyrs, BP 166, 38042, Grenoble, France

In some crystallographic systems, atomic displacements develop at a low energy cost. As the system orders magnetically, they collectively act to further decrease the interaction energy, with drastic consequences on the magnetic properties.

Strongly correlated superconductivity arising in a pseudogap metal — Marco Schiro¹, Massimo Capone²,³, Michele Fabbri²,⁴, and Claudio Castellani² — International School for Advanced Studies (SISSA), and CRS Democritos, CNR-INFM, Via Beirut 2-4, I-34014 Trieste, Italy — ²SMC, CNR-INFM, and Università di Roma La Sapienza, Piazzale Aldo Moro 2, I-00185 Roma, Italy — ³Istituto dei Sistemi Complessi, CNR, Via dei Taurini 19, I-00185 Roma, Italy — ⁴The Abdus Salam International Centre for Theoretical Physics (ICTP), P.O.Box 586, I-34014 Trieste, Italy

We solve by Dynamical Mean Field Theory a toy-model whose phase diagram recalls the physics of high-Tc cuprates and we introduce an ansatz to model the superconducting phase we find out of a pseudogap metal.

The Future Poverty Hiding in Cities — Dimitry Volchenkov — Universitaet Bielefeld, Fakultaet fuer Physik, Mathematische Physik, Universitaetsstrasse 25, D-33615 Bielefeld, Germany

Expected urban population doubling calls for a compelling theory of the city. Random walks and diffusions defined on spatial city graphs spot hidden areas of geographical isolation in the urban landscape going downhill.
Notes