AT-A-GLANCE

Future Perspectives for Understanding the Unsolved Problem of Glass Transition

Image States and Electron Lifetimes in Solid

Interaction of Light with Matter

Recent Research on Novel Magnetic Structures and Their Applications

2nd European Spallation Source SAC Meeting

Photonic Materials for the New Century

Ultrafast Surface Dynamics

EuroConference on the Deposition of Atoms, Ions and Clusters at Surfaces

21st Werner Brandt Workshop on Penetration Phenomena. Atoms and Molecules at Surfaces

Meeting of the Working Group on "Soft Matter" of the SAC

THE WORKSHOPS AT DIPC

FACILITATING THE EXCHANGE OF INFORMATION

State-of-the-art discussions on conceptual and methodological issues are regularly held at DIPC. The close contact and interactive design of the workshops has facilitated the exchange of information and establishment of new creative research collaborations between attending scientists: one of the principal goals of the Foundation. ■

WORKSHOP

Future Perspectives for Understanding the Unsolved Problem of the Glass-transition

JUNE 15-17, 2000

Profs. Colmenero and Richter

Chairmen
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Prof. D. Richter (IFF, Forschungszentrum Jülich GmbH, Germany)

In spite of the great effort made over more than 30 years, the Glass-transition —the way a supercooled liquid becomes a glass— still is "the deepest and most interesting unsolved problem in solid state theory" as the Nobel Prize winner P. W. Anderson stated (Science 267 (1995) 1615). From a theoretical point of view, a new approach was developed in the mid-80s: the Mode Coupling Theory, which describes many important features of the supercooled liquid dynamics and which predicts a purely dynamic Glass–transition. However, unfortunately, this approach does not capture the experimental aspects of the Glass-transition as it is observed in the laboratory. Nowadays, new theoretical concepts are being developed, many of them emerging from molecular dynamics simulations of simple model systems. From an experimental point of view, neutron scattering techniques reveal themselves over the last years as an invaluable tool for addressing this problem. The idea of this workshop was to create a platform for discussion where a reduced number of experts coming from both areas —neutron scattering and computer simulation— can explore together new ways and ideas which can contribute to a better understanding of the problem of the Glass-transition.

CONTRIBUTIONS

D. Richter	**Neutron scattering and the glass transition in polymers: present status and future opportunities**
S. Glotzer	**Dynamical heterogeneity in simulated and experimental fluids via higher order correlation functions**
F. Mezei	**Dynamic heterogeneity and intermediate range order dynamics near the glass transition**
J. Colmenero	**Doing MD-simulations in glass forming polymers as a neutron scattering practitioner**
U. Buchenau	**Is a Maxwell-Arrhenius model of the glass transition possible?**
D.M. Theodorou	**Segmental dynamics in polymer melts and blends: Computer simulations confronted with experimental measurements**
C. Alba-Simionesco	**High pressure neutron scattering experiments on supercooled liquids: How and why?**
W. Paul	**Computer simulation studies of the polymer glass transition: What we did and what we hope to do**
F. Sciortino	**Are aging glasses in quasi-equilibrium?**

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WORKSHOP

Image States and Electron Lifetimes in Solid

JUNE 25-27, 2000

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Image states at metal surfaces are model systems for two-dimensional surface states. Since they are electrons confined to the surface, they can be probed by simple and powerful surface science techniques like two-photon photoemission. This allows the study of the fundamental properties of solids, like electron-electron, crystal-electron and electron-phonon interactions, and compare readily theory and experiment. With the aim of showing the state of the art research on image states at surfaces, the "Workshop on Image Potential States" gathers the most prestigious theorist and experimentalist of the field.

CONTRIBUTIONS

F. Himpsel	**Historic remarks, One-dimensional metals at surfaces**
R. Osgood	**Image-state electron confinement on nanostructured surfaces**
M. Roth	**Image-potential states on Cu(119)**
P. Saalfrank	**Electrons at metal surfaces: energetics, spectroscopy and dynamics**
K. Boger	**Analysis of time-resolved spectra by optical Bloch equations**
W. Ekardt	**On the absence of transport effects in the traditional determination of the lifetime of hot electrons**
W. D. Schöne	**Lifetime of hot electrons in surface and image-potential states**
I. Sarría	**Self-energy and lifetimes of image-potential states on Cu surfaces**
U. Höfer	**Image-potential states on Cu(100): momentum-dependent relaxation dynamics**
W. Pfeiffer	**Image-potential states on graphite**
T. Meier	**Theory of coherent effects in semiconductors and applications to excitons and surface states**
M. Wiets	**Two-photon photoemission on semiconductor surfaces**
A. Hotzel	**Phonon-mediated intraband relaxation of image-potential state electrons in adsorbate overlayers**
W. Berthold	**Image-potential states on Cu(100): decoupling by Ar, Kr and Xe layers**
M. Weinelt	**Phase and energy relaxation of image-potential states**

C. Harris	**Electron localization on surfaces**
M. Wolf	**Electronic excitations at the adsorbate metal interface: Hexaflurobenzene and pyridine on Cu(111)**
M. Donath	**Spin polarization of image-potential states**
H. Dürr	**Image-potential state lifetimes on transition metal (111) surfaces**
E. Chulkov	**Electron dynamics in image-potential states**
A. Goldmann	**Linewidths of hole states at surfaces**

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WORKSHOP

Interaction of Light with Matter

JULY 26-29, 2000

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During the sessions of this workshop, we plan to show different aspects of the interaction of light with matter. The intrinsic interest of this topic has been increasing in the last years due to the wide range of application of many devices based on this kind of interaction. The main focus of the workshop is concerned on the light emission from the scanning tunnelling microscope. Most of the participants are connected with the European network Electromagnetic Interactions in tunnelling and this is the starting point to analyse other topics of interest where the interaction between light and matter is relevant. We plan to study topics such as two photon-photoemission and the measurement of electron lifetimes, characteristics of photonic materials, excitation of plasmons by light, or scattering of light and polymers. The scope of the workshop is to provide a general knowledge about a wide range of situations involving the interaction of light and matter.

CONTRIBUTIONS

P. M. Echenique	**Lifetimes of holes and electrons (2PPE)**
R. Berndt	**Light in STM**
P. Johansson	**Light-in in magnetic materials**
A. Arnau	**Energy loss of ions in metals and insulators**
N. Zabala	**Electronic structure of metallic quantum wires**
F. Alvarez	**Light Scattering in Polymeric Systems**
A. Rubio	**Nanotubes**
A. Rivacoba	**Image potential in STEM**
P. Dawson	**Excitation of plasmons with light**
F. Silly	**STM-induced photon emission from self-assembled metal nanospheres**
F. J. García Vidal	**Light enhancers**
P. Apell	**Excitons and extentons**

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WORKSHOP

Recent Research on Novel Magnetic Structures and Their Applications

SEPTEMBER 18-19, 2000

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This symposium could be a forum to present and discuss different aspects related to fundamental research on magnetic properties and effects of new structures (non-crystalline, quasy-crystalline, nano-crystalline and granular materials) and their technological applications. It is expected that a series of invited, semi-tutorial talks will review the basic magnetic properties (GMR, GMI, magnetization process, etc.). These talks will be followed by a second series that will review the various classes of applications. By bringing some of the most relevant researchers in this subject will create new interest to promote the research and applications of these materials.

CONTRIBUTIONS

AMORPHOUS AND NANOCRYSTALLINE MATERIALS

R. Hasegawa
Design and synthesis of Magnetic Structures

T. Kulik
Nanocrystalline magnetic materials obtained by devitrification of metallic glasses and mechanical alloying

A.R. Yavari, M. de Oliveira and W. J. Botta
Electromechanical Assemblage and Processing of Bulk Metallic Glasses

G. R. Aranda, J. González, J. M. González, O. A. Chubykalo and B. Lengsfield
Micromagnetic simulation of transverse biased initial susceptibility measurements in different 3D systems

H. García-Miquel and M. Vázquez
Ferromagnetic resonance in Co-rich glass-coated amorphous microwires

SMALL PARTICLES AND GRANULAR SYSTEMS

A. Hernando and A. González
Magnetism of Nanostructure Formed by Nanocrystals of Co in Amorphous Matrix

S.D. Kaloshkin, V.V. Tcherdyntsev, I.A. Tomilin, Yu.V. Baldokhin and E.V. Shelehov
Phase transformation in Fe-Ni system at milling and consequent annealing of elemental powder mixtures

J. González, A. Zhukov and J. J. del Val
Structural study of glass coated Cu-based microwires

H. Kronmüller and R. Hertel
Computation micromagnetism of magnetic structures and magnetization process in thin platelets and small particles

J. M. González, C. Prados, A. Sacelo, E. Pina, F. J. Palomares, F. Cebollada, A. Montone and A. Hernando
Some open problems related to the link between structure, morphology and extrinsic magnetic properties in layered nanostructures

L. M. Alvarez-Prado and J. M. Alameda
Weak stripe domains in amorphous thin films: the role of the μ*-effect

MAGNETOTRANSPORT PROPERTIES AND APPLICATIONS

R. Valenzuela
Magnetization processes and magnetoimpedance of CoFeSiB Amorphous wires

J. M. Barandiarán
Magnetic properties and magnetoresistance of perovskite-like mixed oxides

A. Chizhik, A. Zhukov, J.M. Balnco and J. González
Kerr effect investigation of the magnetization reversal in Co-rich wires

H. Chiriac
New bulk amorphous magnetic materials

M. Vázquez
Soft magnetic wires and sensor applications

P. Gorria, V. M. Prida, M. Tejedor, B. Hernando and M. L. Sánchez
Correlation between structure, magnetic properties and MI effect during the nanocrystallization process of Finemet type alloys

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WORKSHOP

2nd European Spallation Source SAC Meeting

MARCH 7-8, 2001

There is general consensus that the future of neutron scattering at the high end will be large MW neutron spallation sources. This has been recognized by the neutron communities in the different world regions and, consequently, the OECD Megascience Forum has recently recommended to develop, construct and operate such facilities in the three world regions: Asia/Japan, North America and Europe. In Europe the project is know as the "European Spallation Source" (ESS). Recently, the ESS Council has created a Scientific Advisory Committee (SAC) which advises the R&D Council on all science aspects of the ESS. In particular, the SAC is responsible for generating an updated science case for the ESS. The SAC, which is formed by 25 members from different countries, has to meet about twice a year. The second meeting of the SAC has taken place at the DIPC , organized by the Director, Juan Colmenero, who is a member of the SAC.

PROGRAM

Status Reports
The status of the ESS technical project
The European political environment
The ENSA Neutron Road Map
The status of SNS
View from the European Science Foundation

Preparation of the SAC Workshop in Wildhaus
Technical Part
Overview of the neutronics and moderator calculations

Report from the progress of the instrument task group (2 presentations)

Report from the science groups (8 presentations)
Science Part
Solid state physics

Material science and engineering

Chemical structure kinetics and dynamics

Soft condensed matter

Continuing report from science groups
Liquids and glasses
Biology and Biotechnology

Earth sciences, environmental science and cultural heritage

Fundamental physics

Discussion on further work towards the workshop
Simulation of specific problems
Further input from the neutronics group
First assessment of the target stations, procedures to be followed
Preparation of draft reports
Technical requirements for long pulse target like choppers, neutron optics, etc.

Further work of SAC
Topical workshops in order to underpin science case
Philosophy for instrument selection
First discussion on target and moderator ensembles together with trial suits of instruments
Endorsements of key instruments
Other uses of the ESS, muons, radioactive beams, neutrinos, isotope production

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WORKSHOP

Photonic Materials for the New Century

MAY 27-31, 2001

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High speed telecommunications are dominated by optical transmissions. Nowadays, optical components continue replacing the electronic ones for applications in processing signals. Developments in new photonic materials will allow the construction of elementary blocks that are necessary for integrated photonics at a big scale. It is predictable that, in the very near future, we are going to be able to speak about the photonic transistor as an essential element for a new generation of signal processing systems.

This international workshop, where scientists all over the world participate, aims to present and evaluate the current situation, predictable advances and possibilities of future investigation lines in the area of photonic materials.

CONTRIBUTIONS

P. Günter
Organic crystals and thin films for nonlinear optics

S. John
Photonic band gap materials: a semiconductor for light

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Ultrafast spin dynamics in semiconductor microcavities

T. Kaino
Electro-optic polymers with high thermal stability

B. Kippelen
Nonlinear organic photorefractive polymers and their applications

F. Agulló-López
Characterization of electrooptic materials by ion-beam techniques

C. López
Optical properties of photonic crystals

F. Meseguer
Photonic bandgap materials based on inverse opals

P. N. Prasad
Nanophotonics: Materials, interactions and applications

I. Ledoux-Rak
Novel development in multipolar molecular engineering: application to optical signal processing and high bit-rate telecommunications

R. Alcalá and C. Sánchez
Azobencene polymers: photoinduced anisotropy and optical storage

C. N. Afonso
Non-linear optical response of metal nanocomposite films

V. M. Orera
Melt growth composites: a new class of advanced materials

H. U. Güdel
New upconversion processes in transition metal and lanthanide doped materials

C. Medrano
Frequency doubled blue lasers using $KNbO_3$

E. Dieguez
Periodically poled lithium niobate structures

F. Kajzar, A. Miniewicz and S. Bartkiewicz
Novel liquid crystal spatial light modulators for optical signal processing

L. Kirpichnikova
Optical properties and ferroelastic domains in some extremely plastic crystals

A. A. Kaminskii
Effects of self-frequency conversion in nonlinear-laser $X^{(2)}$- and $X^{(3)}$-crystals

F. del Monte, D. Levy
Identification of fluorescent dimers in sol-gel glasses

J.-L. Adam
Chalcogenide glasses: photonic materials with active and passive functions

L. Martín
Theory of extraordinary optical transmission through subwavelength hole arrays

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WORKSHOP

Ultrafast Surface Dynamics

JULY 9-11, 2001

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The dynamics of hot electrons at solid surfaces and interfaces is important for a basic understanding of electron or photon induced processes, like the chemical reactivity of atoms and molecules at catalysts, and the physics of small semiconductor devices. New theoretical approaches as well as advanced experimental techniques have been put forward to gain a deeper insight into the various mechanisms that govern relaxation, dephasing and charge transfer of electrons at metal surfaces on the atomic timescale, the femtosecond. On the theory side, the full k-space dependence of the relaxation mechanisms in ab initio treatments, using schemes that combine many-body theory for calculating lifetimes with density matrix formalisms that allow to include excitation and deexcitation in a consistent way. On the experimental side, refined model systems have been investigated with a variety of powerful techniques like high resolution photemission, time resolved two-photon photoemission, or scanning tunneling microscopy. Experiments and theory have recently started to exhibit a general agreement and a thorough description of the physics underlying is emerging. New challenges are ahead, such as the exotic electronic and magnetic properties of artificial nanostructures.

CONTRIBUTIONS

MAGNETISM

B. Koopmans **All-optical studies of ultrafast spin dynamics**

W. Eberhardt **Femtosecond spin dynamics in magnetic CoPt nanostructures**

SURFACE STATES

S. Huefner **Surface states on the (111) noble metal surfaces**

Chang Chiang **Quasiparticle lifetimes determined by photoemission>T**

H. Brune **STM measurement of phase coherence length and inelastic lifetime of hot surface state electrons**

ALKALI ATOMS

A. Borisov **Adsorbate induced resonance in Cs/Cu(111): effect of the adsorbate motion on the transient electronic state dynamics**

H. Petek **Surface femtochemistry Frustrated desorption of alkali atoms from noble metals**

IMAGE POTENTIAL STATES

B. Gumhalter **Decoherence of "excitons" created in the states of image potential in the first step of 2PPE spectroscopy of surfaces**

U. Hoefer **Properties of image-potential of Cu in the presence of Ar, Kr and Xe spacer layers**

W. Berthold **Momentum-dependent lifetimes of image-potential states**

T. Fauster **Decay and dephasing of image-potential states at stepped surfaces**

NANOPARTICLES

M. Aeschlimann **Time and spatially resolved studies on metallic nanoparticles**

J.Y. Bigot **Electron dynamics in metal nanoparticles: influence of the surface induced polarization**

W. Pfeiffer **Transient electron gas temperature in Ag nanoparticles on graphite**

VIBRATIONS

T. Heinz **Atomic-scale investigation of surface diffusion induced by hot electrons**

M. Bonn **Surface dynamics studied with time-resolved vibrational spectroscopy**

C. Hess **Femtosecond dynamics of chemical reactions at surfaces**

HIGHER HARMONICS

H. Zacharias **Femtosecond EUV and soft X-ray pulses for the study of dynamic processes at surfaces**

M. Bauer **Use of high order harmonics for time-resolved photoemission spectroscopy**

G. Reider **Measurement of near-attosecond XUV pulses by photoemission-cross-correlation**

INNOVATIVE TECHNIQUES AND SYSTEMS

J. Kirschner **Coincidence spectroscopy of electron-electron scattering in the valence band of metals**

T. Hertel **Spectroscopy of electron dynamics near the Fermi level: A new probe of electronic transport phenomena?**

M. Weinelt **Lifetimes of surface states at Si(OO1) surfaces**

W. Pfeiffer **Time-resolved spectroscopy of transport phenomena in metal-insulator-metal contacts and in Schottky contacts**

MOLECULES

A. Nitzan **Inelastic effects in electron transmission through molecules and molecular layers**

F. Willig **Time-resolved electron injection from an adsorbed molecule into a semiconductor modulated by vibrational wavepacket motion**

LIFETIME

W. Ekardt **Electron dynamics in photochemically relevant single-electron states: from the volume to the chemisorbed state**

A. Eguiluz **Electron-hole excitations in narrow-band metals: A novel theoretical perspective within time-dependent density functional theory**

E. Chulkov **Electron and hole dynamics at metal surfaces**

A. Liebsch **Dynamics of hot electrons at noble-metal surfaces**

P.M. Echenique **Closing remarks**

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WORKSHOP

EuroConference on the Deposition of Atoms, Ions and Clusters at Surfaces

SEPTEMBER 12-16, 2001

Chair of the Series
Prof. P.M. Echenique (Universidad del País Vasco/Euskal Herriko Unibertsitatea, Spain)

Chair of the EuroConference
Prof. R.M. Nieminen (Helsinki University of Technology, Finland)

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Prof. J. Gimzewski (UCLA, USA)
Prof. N. Stolterfoht (H.M.I. Hahn-Meitner Institüt, Germany)
Prof. H. Urbassek (Universität Kaiserslautern, Germany)

The topics of the sessions include various aspects of particle-surface interactions, such as implantation, surface modification, morphology, atomic manipulation and imaging, cluster deposition, electronic excitations, charge transfer, and nanoscale structures. Experimental, theoretical and computational topics were presented.

63 scientists from 20 european countries and the United States participated in this Euroconference.

CONTRIBUTIONS

R. Palmer
Fabrication of nanostructural surfaces from clusters

K. Fichthorn
Surface-mediated adsorbate interactions: quantification and ramifications for nanostructures at surfaces

R. Averback
Ion irradiation induced nanostructures in metals

L. Colombo
Theoretical investigations of low-energy recoils in silicon

B. Svensson
Diffusion and defect reactions in silicon-based semiconductors

A. Howie
Environmental scanning electron microscopy

F. Banhart
The generation of new nanoparticles under irradiation

E. Campbell
Ion implantation of fullerenes

T. Frauenheim
Density-functional approach to nanoscale materials and processes

T. Michely
Atomic processes in damage and erosion of surfaces by low-energy ions

K. Nordlund
Surface modification and erosion by ions and clusters

H. Häkkinen
First-principles investigations of chemical reactivity of supported metal catalysts

M. Di Ventra
Electronic transport in molecular clusters

T. R. Linderoth
Formation and stability of nanostructures on metal surfaces studied by high-resolution STM

P. Zeijlmans van Emmichoven
Thermal metastable He atoms interacting with single crystal surfaces

A. Borisov
Quantum size effects in charge transfer between a projectile and the surface of a thin metal film

A. Rubio
Time-dependent DFT for the optical response of clusters and solids

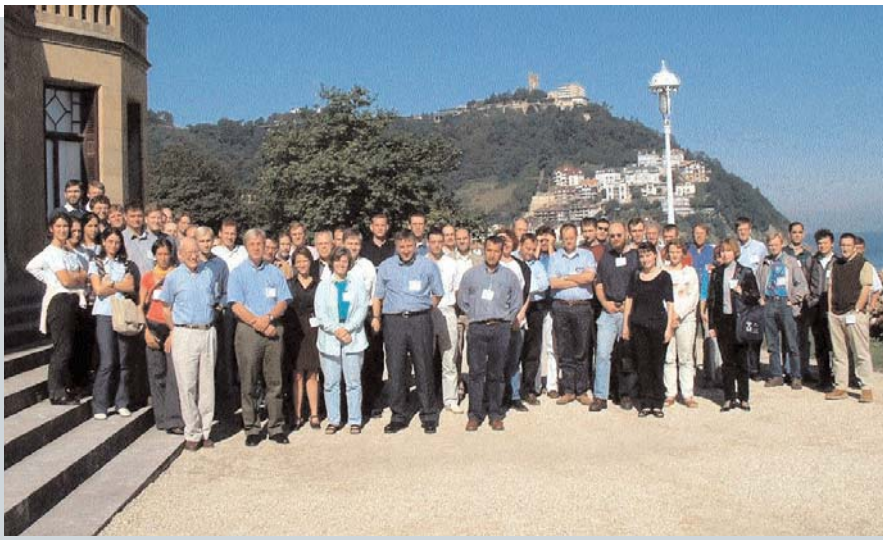
M. Moseler
Surface processing with cluster beams and liquid nanojets

M. Rauscher
Energetic beam deposition and processing of thin films

P. Hyldgaard
Nature and consequences of long-range interactions at surfaces

J. Buttet
Energetic cluster deposition on a dislocation network

M. Manninen
Interplay of the geometry and the electronic structure in free and deposited metal clusters



WORKSHOP

21st Werner Brandt Workshop on Penetration Phenomena. Atoms and Molecules at Surfaces

SEPTEMBER 17-18, 2001

Chairmen
Prof. P. M. Echenique (Universidad del País Vasco/Euskal Herriko Unibertsitatea, Spain)
Prof. R. Rivacoba (Universidad del País Vasco/Euskal Herriko Unibertsitatea, Spain)

Program committee
Prof. R.A. Baragiola (Virginia University, USA)
Prof. G.J. Basbas (Editor of *Physical Review Letters*)
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Prof. F. Flores (Universidad Autónoma de Madrid, Spain)
Prof. K. Komaki (University of Tokyo, Japan)
Prof. R. H. Ritchie (Oak Ridge National Laboratory, USA)
Prof. J. Sabin (University of Florida, USA)

The Werner Brandt Workshops constitute a series of scientific meetings dedicated to the study of the interaction between charge and radiation with matter. The 21st issue is centered around the topic "Atoms and molecules at surfaces". The meeting covers other related topics such as: Non linear response, Dynamic Charge State Effects, Fs dynamics of electrons, Plasmons and excitons.

CONTRIBUTIONS

V. Nazarov	**The nonlinear mechanism of plasmon damping in 2D electron gas**
I. Nagy	**Unscreened fast particles in a correlated fermion system: an estimation for the Barkas effect**
P.M. Echenique	**Nonlinear screening in two-dimensional electron gases**
J. Garcia de Abajo	**Scattering of light on complex structures**
M. Roesler	**Particle-induced electron emission from simple metals: Thresholds for plasmon excitation**
E. Ogando	**Dielectric approach to EELS in nanowires**
J. Aizpurua	**Tunnable nano-emitter in the scanning tunnelling microscope cavity**
N. Stolterfoht	**Transmission of Ne7+ ions through nanocapillaries etched in polymer PET: Evidence for capillary channeling**
P. Zeijlmans van Emmichoven	**Kinetic electron emission in collisions of keV ions with CU (110) surface**

A. Robin	**Energy loss of nitrogen ions scattering off a Pt(110) (1x2) surface under grazing incidence**
A. Dubus	**Theoretical study of kinetic electron emission induced by slow N(q+)-ions on gold targets**
H. Winter	**Studies on electron emission during grazing impact of Hydrogen atoms on LIF (001) via translation energy spectroscopy**
H. Khemliche	**Ion/atom induced excitations in ionic insulators: excitons and trions**
R. Diez Muino	**Angular distributions of electrons photoemited from core levels of oriented diatomic molecules: Multiple scattering theory in non-spherical potentials**
W. Schattke	**Alkali Diffusion and Intercalation on Layered Crystals**
A. Howie	**Low Energy Beams and Excitations - More Room at the Bottom ?**
E. Chulkov	**Screening and quasiparticle lifetimes in bulk metals and their surfaces**
D. Menzel	**Charge transfer times from absorbates at metal surfaces in the low femtosecond range**
V. Joukov	**The lifetimes of electrons excitations in metals: comparisons between the first-principle GW theory and previous models**
D. Sanchez Portal	**Monatomic Au wires on the Si(557)-Au surface: a Luttinger liquid?**

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WORKSHOP

Meeting of the Working Group on "Soft Matter" of the SAC

NOVEMBER 23-24, 2001

In the framework of the Scientific Advisory Committee (SAC) of the European Spallation Source (ESS) project, different working groups have been recently created. The convener of one of these groups —the one dealing with "Soft Matter"— is Juan Colmenero, Director of DIPC. The main activity of these groups is to prepare and develop the work carried out by the SAC in the different scientific areas. The main goal of the meeting in San Sebastian, was related with the technological implications of the construction of the ESS in the field of "Soft Matter", in particular, taking into account the priority research areas of the 6th Framework of the European Comission.

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F. Boue ..... Laboratoire Léon Brillouin (CEA-CNRS). (France)

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K. Mortensen..... Danish Polymer Centre (Denmark)

D. Richter..... FZ Jülich (Germany)

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