DONOSTIA INTERNATIONAL PHYSICS CENTER

REPORTING ON
2000/01

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Reporting on 2000/01

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Isamu Noguchi **Water Stone** 1986

FINALLY EVERYTHING FALLS INTO PLACE

AND EMERGES WITH

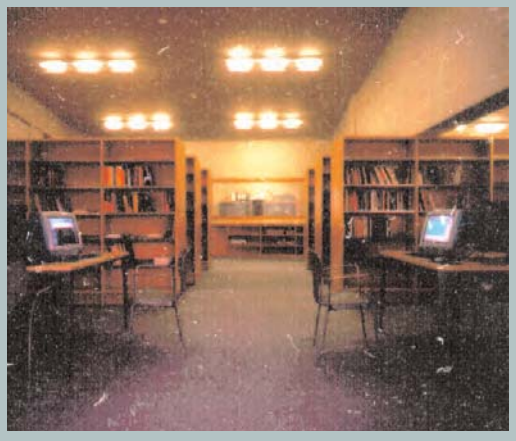
SUCH A PRECISION

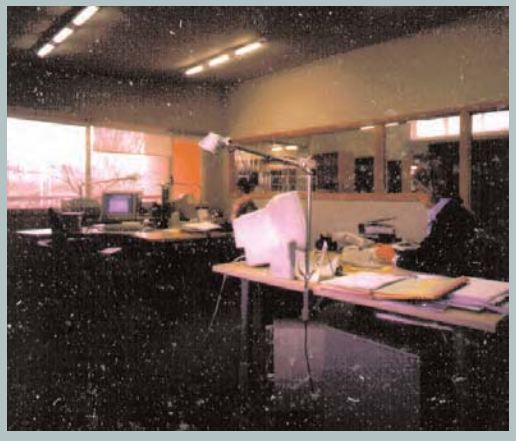
SO REMARKABLE THAT

IT CANNOT

BE CHANCE

INSIDE Reporting on 2000/01





WELCOME TO THE DIPC FOUNDATION

A CENTER FOR EXCHANGE AND CREATIVITY BETWEEN SCIENTISTS FROM THE WORLD AROUND

DIPC was inaugurated in April 2000 with the aim of promoting international scientific exchange between physicists primarily, but not excluding the participation of other scientists in interdisciplinary projects.

The Center is located at the San Sebastian campus of the University of the Basque Country, and provides select combination of attractions from sheer academic interest to historical, cultural, gastronomic and picturesque experiences.

Fundamentally dedicated to research, the Center also hosts other forms of scientific endeavor, such as workshops, lectures, seminars and special events for the communication of science to the general public.

DIPC is the first center of its nature in the Basque Country, and it also aims to project the forward-looking, industrious and welcoming nature of the Basque people to its visitors, while providing the opportunity for Basques to access the most advanced scientific knowledge in the world. ■

THE BOARD

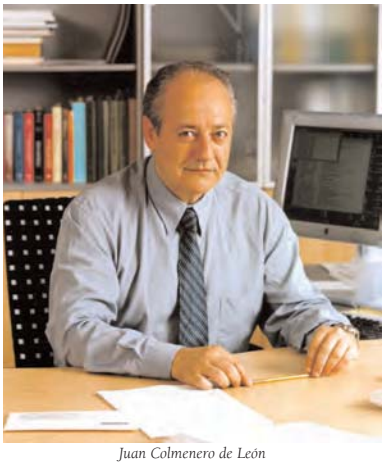
DIPC IS MANAGED BY A BOARD COMPOSED OF THE PRESIDENT, THE GENERAL DIRECTOR AND THE SECRETARY

Pedro Miguel Echenique Landiribar is Professor of Condensed Matter Physics at the University of the Basque Country. He obtained his PhD at Cambridge (1976) and Barcelona (1977) and has Honorary degrees from Cambridge (Doctor of Science 1998) and Doctor Honoris Causa from Valladolid (2000). He is a Fellow of the American Physical Society (FAPS) and of the American Association for the Advancement of Science (FAAAS). He holds the Gold Medals of the University of the Basque Country and of the City of San Sebastian.

Juan Colmenero de León is Professor of Condensed Matter Physics at the University of the Basque Country. He obtained his PhD in Physics at the University of Navarra (1979). His research activities are Polymer Physics and Non-Crystalline Materials. He is a member of the Editorial Board of the Journal Colloid & Polymer Science, member of the Scientific Committee of the European Spallation Source Project and Chairman of the Selection Panel of the European Project "Jülich Neutrons for Europe". He has been awarded the "Xabier María de Munibe" Prize in Science & Technology (1998) given by the Basque Parliament and the Euskadi Prize of Research in Science & Technology (2000) given by the Basque Government.

Alberto López Basaguren is Professor of constitutional law. He obtained his degree in political sciences from Universidad Complutense in Madrid and a PhD from the University of the Basque Country. (1990). He furthered his studies in Florence and Bologna (Italy). He continues his research in economic, constitutional and linguistic law and its integration in the European community. He is formerly Secretary General of the University of the Basque Country. ■

Pedro Miguel Echenique Landiribar
DIPC President



Juan Colmenero de León
DIPC General Director

Alberto López Basaguren
DIPC Secretary

Basque Government

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Patrons and Board Members at the celebration of the opening of DIPC. From left to right: Alberto López Basaguren, Odón Elorza, Manuel Montero, Román Sudupe, Inaxio Oliveri, Pedro Miguel Echenique, Juan Colmenero, Joseba Jaureguizar, Félix Ares, Unai Ugalde, Ander Gurrutxaga, Javier Zúñiga

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PROFESSOR ROHRER Nobel Prize in Physics, 1984

SMALL IS BEAUTIFUL AND POWERFUL

Prof. Henrich Rohrer Celebrates the Opening of DIPC

APRIL 26, 2000

"The purpose of an international center is to bring science together from different cultures, of different thinking and that is one of the very promising ways of approaching solutions to the complex issues of the future. Nano-science, nano-technology I think is the one type of technology and science which is purely interdisciplinary"...

"One may ask why should small be beautiful and powerful. Nowadays everybody wants to be big; to be important; you compare, you merge, you take over. A new idea comes up in a brain, not in a company. I think there are many things you can see that start small"...

"Small is wonderful because small brings completely new opportunities and completely new possibilities. Small is wonderful because small practically always means faster, small means large numbers, small but large numbers. Small means sustainable. I think that is very clear; small is sustainable. If you use very little material, you can make more out of it. Small very often means more sensitive...on a nanometre scale, it doesn't make sense any more to talk about physics, or chemistry, or biology. It's all the same. I think that's one of the most interesting aspects that makes the magic of small, the beauty of small and the power of small."

Professor Echenique and President Ibarretxe

THE DIPC FOUNDATION WELCOMES

Juan José Ibarretxe
President of the Basque Country

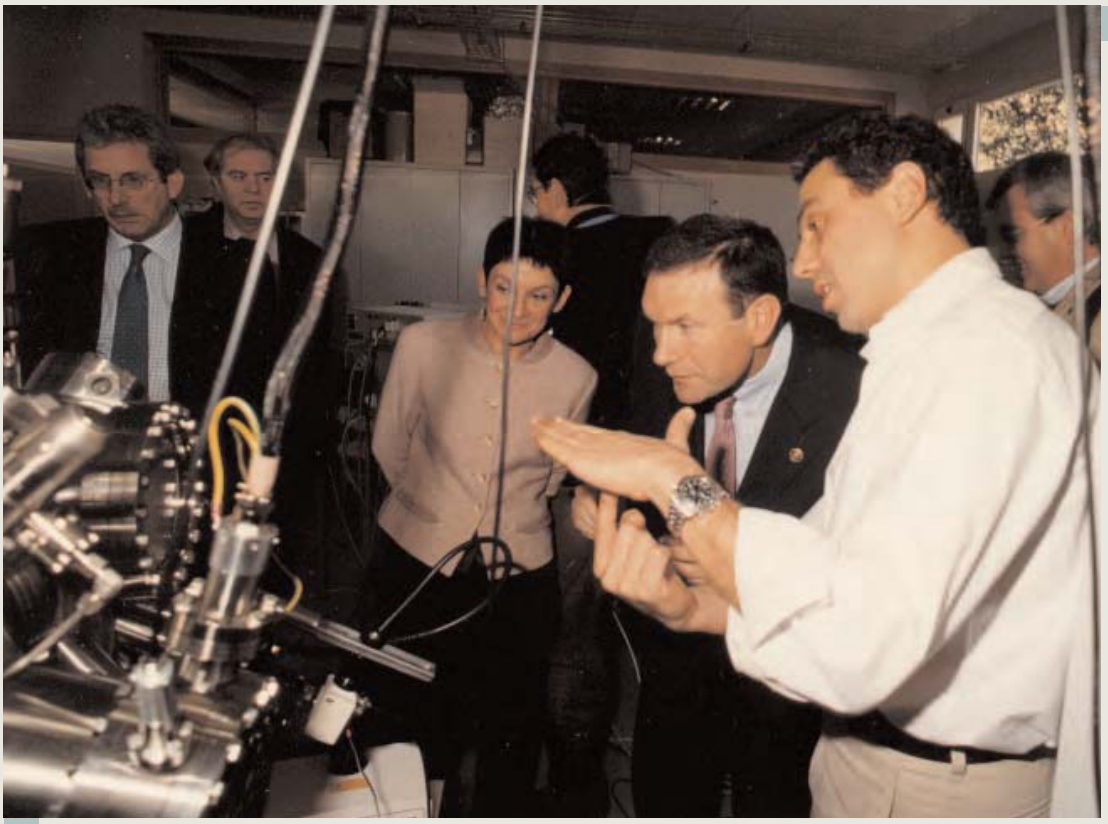
DECEMBER 2001

The President *expressed his gratitude to all institutions taking part in raising a basic research center such as DIPC in the Basque Country. He also expresses his satisfaction for the degree of compromise and strategic foresight of enterprises such as Kutxa and Iberdrola, in supporting this project which he considers to be important for Science and Technology in the Basque Country, as well as to its outward image.*

Regarding economic development, the president refers to the opening of a new phase, in which the debts incurred in throughout the 80's decade is being levelled, and the next challenge on innovation is coming into focus. The expansion of new technologies is the subject of our attention at this time, alongside the new knowledge society and research development.

The President indicates that the target for 2004 will be to reach a level of spending in R+D+I activities of 1.7% of GDP. This budgetary effort must be accompanied of an evaluation of the investment and results derived from our efforts, as money must be well spent.

He finally argues that public institutions involved in DIPC are extraordinarily satisfied and proud of the results which are being attained. ■



Scanning tunneling electron microscope is shown in operation to President Ibarretxe.

PRESIDENTIAL VISIT

President Ibarretxe greets researchers at DIPC.

Exchanging views.

RESEARCH ACTIVITY

DIPC IS DEDICATED TO TWO MAIN AREAS OF RESEARCH

Condensed Matter Physics

The current activity —mainly theory and computational physics— is focussed on three different lines: Interactions of ions with matter; Electronic response of surfaces, solids and nanostructures; Interaction of fast electrons and radiation with nanostructured materials. Moreover, a Nano-Physics Laboratory project is being developed in collaboration with a Technological Center of the Basque Country (Labein). Within these general areas, different recent topics can be identified:

Interaction of ions with matter

Phase effect in the stopping of ions in metals
Stopping of slow ions in insulators

Electronic response of surfaces, solids and nanostructures

Dynamics of electrons and holes in solids and at their surfaces
Electronic properties in finite and extended systems
Electronic structure and magnetic properties of nanowires

Interaction of fast electrons and radiation with nanostructured materials

Interaction of radiation and fast electrons with complex nanostructures (Smith-Purcell and microscopy based light emission induced by fast electrons)
Plasmon excitations in nanostructures
Photoemission from core and valence levels

Polymers and Non-crystalline Materials

The current activities in this area are focussed on the general line: Molecular motions and relaxation processes in polymer materials and glass-forming systems. This is mainly an experimental approach by combining different techniques, in particular, neutron scattering, broadband dielectric spectroscopy and NMR. Moreover, we are also developing fully atomistic molecular dynamics simulations of polymer systems. Within this general area, we can identify the following recent topics of research:

Molecular motions and relaxation processes in polymer materials and glass-forming systems

Dynamics of multicomponent polymer systems

Atomistic MD-Simulations in simple polymers

Dynamics of glass-forming polymers at "intermediate range order" length scales

The problem of the Glass Transition

Relationship between transport properties and molecular mobility in polymeric membranes

Biomolecules vs synthetic polymers. Universal dynamic properties?

PUBLICATIONS 2000/01

A LEADING ROLE IN PRIMARY RESEARCH

DIPC staff and visiting scientists have undersigned original scientific articles in reputable international journals. High productivity and quality in this field reflects the commitment for creativity and originality in research. From the start, DIPC aims to play a leading role in scientific discovery. ■

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E. G. Michel, and F. J. Himpsel.
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AT-A-GLANCE

J. Alonso
P. Apell
A. Baró
R. Barrera
P. Bauer
W. Berthold
L. Blanco
J.M. Bletry
A. Castro
M. A. Cazalilla
A. Correia
J. Dobson
A. Eguiluz
P. Feibelman
L. Fetters
C. Fiolhais
M. S. Gravielle
L. Henrard
F. Himpsel
A. Howie
J.E. Inglesfield
E. Krasovskii
J. I. Latorre
A. Liebsch
S.G. Louie
A. Lucas
N.H. March
A. Marini
D. Menzel
R. Moniot
A. Moreno
R. Nieminen
H. Petek
W. Plummer
V. Popov
D. Richter
R. H. Ritchie
H. Rohrer
A. Salin
W. Schattke
O. Tetsuyuki
E. Tosatti
M. A. Van Hove
H. Winter
N. Yamamoto
E. Zaremba
P. A. Zeijlmans
R. Zorn

VISITING RESEARCHERS

DIPC UNDERSTANDS THE IMPORTANCE OF CONSTANT EXCHANGE OF KNOWLEDGE BETWEEN RESEARCHERS

There are considerable number of researchers at DIPC that are temporary visitors, in the understanding that modern science entails the constant exchange of knowledge and experience to the benefit of all involved. Thus new research collaborations are not only attained between staff and visiting researchers, but also between visiting researchers through the Foundation. ■

Prof. J. Alonso

COMING FROM Universidad de Valladolid (Spain)
DATE 06/03 through 06/10/2001
AREA OF RESEARCH **Electronic structure of atomic clusters.**

Prof. P. Apell

COMING FROM Institute of Theoretical Physics, Chalmers University of Technology. Goteborg (Sweden)
DATE 07/24 through 07/31/2000
AREA OF RESEARCH **Interaction of charges and radiation with surfaces.**
Study of the processes of oxidation in aluminium surfaces.

Prof. A. Baró

COMING FROM Universidad Autónoma de Madrid (Spain)
DATE 1/18/2001
AREA OF RESEARCH **First principles LAPW calculations of quasiparticle excitations on metal surfaces.**

Prof. R. Barrera

COMING FROM Universidad Autónoma de México (Mexico)
DATE 07/01 through 07/04/2001
AREA OF RESEARCH **Does an effective index of refraction in granular matter always exist?**

Prof. P. Bauer

COMING FROM Johanes Kepler Universität, Linz (Austria)
DATE 07/01 through 07/31/2001
AREA OF RESEARCH **Electronic excitations in the interaction of charges with surfaces.**

Dr. W. Berthold

COMING FROM Phillipps Universität, Marburg (Germany)
DATE 06/02 through 06/13/2001
AREA OF RESEARCH **Electron dynamics at metal surfaces.**

Dr. L. Blanco

COMING FROM Universidad de Salamanca (Spain)
DATE 12/03 through 12/05/2001
AREA OF RESEARCH **Electron-induced light emission in photonic crystals.**

Prof. J.M. Bletry

COMING FROM (INST), CEA. Grenoble (France)
DATE 06/25 through 06/27/2000 and 11/24 through 11/27/2001
AREA OF RESEARCH **The glass transition in tetrahedric compounds.**

A. Castro

COMING FROM Universidad de Valladolid (Spain)
DATE 07/01 through 07/16/2001
AREA OF RESEARCH **TDDFT in clusters.**

Dr. M. A. Cazalilla

COMING FROM Brown University, Rhode Island (USA)
DATE 08/02 through 08/22/2001
AREA OF RESEARCH Study of the behavior of Luttinger liquids out of equilibrium.

Dr. A. Correia

COMING FROM CMP Cientifica S.L., Madrid (Spain)
DATE 05/24 through 05/26/2001
AREA OF RESEARCH Nanotecnology.

Prof. J. Dobson

COMING FROM Griffin University (Australia)
DATE 03/28 through 04/06/2001
AREA OF RESEARCH Van der Waals interactions.

Prof. A. Eguiluz

COMING FROM Department of Physics and Astronomy, University of Tenessee (USA)
DATES 10/03 through 10/12/2000 and 7/07 through 07/17/2001
AREAS OF RESEARCH Dynamical Density Response in Zn and Ag: Threshold Effects Due to Flat Bands.
Many-Body Excitations in Real Metals.

Prof. P. Feibelman

COMING FROM Sandia National Laboratoires. Albuquerque, New Mexico (USA)
DATE 09/03 through 09/08/2001
AREA OF RESEARCH Ab initio calculations of surface structure.

Prof. L. Fetters

COMING FROM Jülich IFF (Germany)
DATE 07/01 through 07/04/2001
AREA OF RESEARCH The Packing Length. A Basis for Melt State Rheological Parameters.

Prof. C. Fiolhais

COMING FROM Universidade de Coimbra (Portugal)
DATE 07/18 through 07/26/2001
AREA OF RESEARCH Computational Physics of Condensed Matter and Use of Computers for Teaching Sciences.

Dr. M.S. Gravielle

COMING FROM School of Exact and Natural Sciences. University of Buenos Aires (Argentina)
DATE 07/22 through 07/25/2001
AREA OF RESEARCH Energy and electron spectra after ion-surface collisions.

Dr. L. Henrard

COMING FROM Laboratoire de Physique du Solide, Namur (Belgium)
DATE 05/02 through 06/02/2001
AREA OF RESEARCH Raman in nanotubes.

Prof. F. Himpsel

COMING FROM Department of Physics. University of Wisconsin-Madison (USA)
DATE 06/28 through 07/15/2000
AREA OF RESEARCH Surface states.

Prof. A. Howie

COMING FROM Metal Physics Group, Cavendish Laboratory. Cambridge (England)
DATES 09/04 through 09/18/2000 and 09/01 through 09/22/2001
AREA OF RESEARCH Energy loss in STEM electrons.

Prof. J.E. Inglesfield

COMING FROM Department of Physics and Astronomy. University of Wales, Cardiff
DATE 05/09 through 05/13/2000
AREA OF RESEARCH Friedel oscillations around subsurface impurities on GaAs(110).

Dr. E. Krasovskii

COMING FROM Universität Kiel (Germany)
DATE 12/20 through 12/24/2001
AREA OF RESEARCH First principles LAPW calculations of quasiparticle excitations on metal surfaces.

Prof. J. I. Latorre

COMING FROM Universitat de Barcelona (Spain)
DATE 06/17 through 06/20/2001
AREA OF RESEARCH Quantum computation.

Prof. A. Liebsch

COMING FROM Institute of Solid State Research, Jülich (Germany)
DATE 07/07 through 07/27/2001
AREA OF RESEARCH Many-body calculations of electronic band structure.

Prof. S.G. Louie

COMING FROM University of California, Berkeley (USA)
DATE 07/26 through 08/04/2001
AREA OF RESEARCH Excitations in extended and low dimensional systems.

Prof. A. Lucas

COMING FROM Fundp Namur (Belgium)
DATE 05/05 through 05/11/2000
AREA OF RESEARCH From what is Light to what is Life: an account of how X-rays cracked the structure of DNA.

Prof. N.H. March

COMING FROM Universiteit Antwerpen (Belgium)
DATE 05/24 through 06/07/2001
AREA OF RESEARCH Basic formulation of DFT.

Dr. A. Marini

COMING FROM Università di Roma (Italy)
DATE 06/05 through 06/11/2001
AREA OF RESEARCH **Lifetimes in metals.**

Prof. D. Menzel

COMING FROM Physik Department. Technische Universität München (Germany)
DATE 05/21 through 05/27/2001 and 09/03 through 09/29/2001
AREA OF RESEARCH **Femtosecond dynamics of adsorbate charge-transfer processes as probed by high-resolution core-level spectroscopy.**

Prof. R. Moniot

COMING FROM Fordham University. New York (USA)
DATE 07/02/2000
AREA OF RESEARCH **Ethical Issues of the Desktop Metaphor.**

Dr. A. Moreno

COMING FROM Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)
DATE 10/01 through 10/31/2001
AREA OF RESEARCH **Dynamics of methic groups in polymic systems.**

Prof. R. Nieminen

COMING FROM Helsinki University of Technology (Finland)
DATE 09/10 through 09/17/2001
AREA OF RESEARCH **Electronic excitations in the interaction of charges with matter.**

Prof. H. Petek

COMING FROM Advanced Research Laboratory, Hitachi Ltd (Japan) and University of Pittsburgh, Pennsylvania (USA)
DATES 09/02 through 09/07/2000 and 07/05 through 07/12/2001
AREAS OF RESEARCH **Ultrafast two-phonon photoemission studies of the alkali atom dynamics on noble metal surfaces.**
Nanotechnology. Dynamics of electrons in surfaces.

Prof. W. Plummer

COMING FROM University of Tennessee, Oakridge (USA)
DATE 09/04 through 09/05/2000
AREA OF RESEARCH **The dynamical role of defects in 2D phase transitions: from charge density waves to defect density waves.**

Prof. V. Popov

COMING FROM Altai State Technical University, Barnaul (Russia)
DATE 01/01 through 01/31/2001
AREA OF RESEARCH **Dynamics of electrons in magnetic materials.**

Prof. D. Richter

COMING FROM IInstitut für Festkörperforschung, Forschungszentrum Jülich GmbH. Jülich (Germany)
DATES 06/25 through 07/10/2000 and 07/01 through 07/16/2001
AREA OF RESEARCH Polymer dynamics.

Prof. R. H. Ritchie

COMING FROM Health and Safety Research Division, Oak Ridge National Laboratory. Tennesse (USA)
DATES 04/01 through 05/22/2000, 10/08 through 11/09/2000 and 04/25 through 05/24/2001
AREA OF RESEARCH Interactions of ions and electrons with surfaces.

Prof. H. Rohrer *Nobel Prize in Physics, 1984*

COMING FROM IBM Laboratory. Zurich (Switzerland)
DATE 04/26 through 04/28/2000
DIPC Foundation Opening Conference "Small is beautiful and powerful"

Prof. A. Salin

COMING FROM LPCM, Université de Bordeaux (France)
DATE 10/01 through 10/31/2001
AREA OF RESEARCH Interaction of charges with solids and surfaces.

Prof. W. Schattke

COMING FROM Institut für Theoretische Physik und Astrophysik. Universität Kiel (Germany)
DATES 04/27 through 05/05/2001 and 09/13 through 10/13/2001
AREA OF RESEARCH Theory of valence photoemission.

Dr. O. Tetsuyuki

COMING FROM Universidad Autónoma de Madrid (Spain)
DATE 12/08 through 12/13/2001
AREA OF RESEARCH Photonic crystals.

Prof. E. Tosatti

COMING FROM SISSA/ITCP, Trieste (Italy)
DATE 07/31 through 08/20/2001
AREA OF RESEARCH Many-body calculations in surfaces.

Prof. M. A. Van Hove

COMING FROM Lawrence Berkeley National Laboratory, California (USA)
DATE 05/01 through 05/05/2001
AREA OF RESEARCH Theory of photoemission from the valence band of solids.

Prof. H. Winter

COMING FROM Humboldt Universitåt, Institut für Physik, Berlin (Germany)
DATE 08/06 through 08/12/2001
AREA OF RESEARCH Stopping power of ions in insulator surfaces.

Prof. N. Yamamoto

COMING FROM Tokyo Institute of Technology (Japan)
DATE 11/16 through 11/20/2000
AREA OF RESEARCH **Photon emission from silver particles induced by high energy electrons.**

Prof. E. Zaremba

COMING FROM Department of Physics, Stirling Hall. Queens University. Ontario (Canada)
DATE 07/01 through 07/31/2000
AREA OF RESEARCH **Dynamic Response of a 2-D Electron Gas.**

Dr. P. A. Zeijlmans

COMING FROM Utrecht University (Netherlands)
DATE 09/19 through 10/01/2001
AREA OF RESEARCH **Ionic spectroscopies at surfaces.**

Dr. R. Zorn

COMING FROM Institut für Festkörperforschung, Forschungszentrum Jülich GmbH. Jülich (Germany)
DATE 07/14 through 08/04/2000
AREA OF RESEARCH **Polymer dynamics.**

AT-A-GLANCE

S. Deutscher

R. Díez Muiño

S.V. Eremev

B. Gumhalter

B. Hellsing

A. Joukov

V. Joukov

J. Kuntze

I. Koroteev

E. Leroy

C. Lorthioir

M. Marqués

I. Nagy

J. Osma

V. Popov

M. Röesler

S. Silkin

M. Voda

OUR RESEARCHERS

AN INTERNATIONAL TEAM

The Foundation hosts long-term researchers which collaborate with visiting researchers on leading topics in Condensed Matter Physics and Polymer and Non-Crystalline Materials. The staff is international in origin; Croatia, France, Germany, Portugal, Russia, Sweden, and the USA. This is a feature of DIPC which reflects the very nature of modern scientific discovery. ■

Dr. S. Deutscher

COMING FROM Université de Paris-Sud. Orsay Cedex (France)
Laboratoires des Collisions Atomiques et Moleculaires (LCAM)

DATE 04/01/2000 through 09/15/2001

The following subjects are being studied:

- Investigation of metallic systems which are strongly perturbed by a heavy ion (Z>>1): it uses distorted wave functions to study in random phase approximation (RPA) the selfconsistent response of the metallic substrate to the perturbing ion and Auger transition rates in such systems.
- Investigation of interactions of slow ions with insulators. Focusses on charge exchange and energy loss phenomena during the interaction of slow ions with insulators.

These projects involve a Ph.D. student, several members of DIPC and of the Departamento de Física de Materiales of the Universidad del País Vasco/Euskal Herriko Unibertsitatea, as well as collaborators from France and Canada.

Dr. R. Díez Muiño

Member of Fellows Gipuzkoa: a program supported by Provincial Authority of Guipuzcoa

COMING FROM Lawrence Berkeley National Laboratory. California (USA)

ARRIVAL DATE 12/01/2000

Multiple Scattering in Non-Spherical Potentials (MSNSP) is used to calculate the angular distributions of electrons photoemitted from the 1s-shells of CO and N2 gas-phase molecules, with fixed-in-space orientations, as recently measured by several groups. For low kinetic energies of the photoemitted electrons (E<50 eV), as appropriate to certain shape-resonances, the electron scattering cannot be adequately represented by spherically-symmetric potentials. Hence we include non-spherical scattering potentials in our formalism through non-diagonal scattering matrices. The experimentally measured angular patterns, including those at the shape resonance energies, are accurately reproduced by our calculations.

Dr. S.V. Eremev

COMING FROM Institute of Strength Physics and Materials Science
Russian Academy of Sciences. Tomsk (Russia)

DATE 03/01 through 05/31/2000

For investigations of electron-phonon interactions on clean metal surfaces covered with adlayers of alkali atoms the quasi-one dimensional model has been developed. The key point of this model is the unscreened potential of a single atomic layer. This potential is constructed from the well known quasi-one dimensional screened model potential generated for thin films of many metals. The proposed single layer "ion" potential gives allow to calculate the transversal and longitudinal phonon modes and deformations potential and can be directly used for the calculation of the electron-phonon contributions the electronic lifetimes.

Prof. B. Gumhalter

COMING FROM Institute of Physics of the University Zagreb (Croatia)

DATE 11/01 through 12/31/2001

Several topics have been planned to be studied and discussed with the researchers and Ph.D. students during the visit to the DIPC:

- Decoherence effects associated with spatio-temporal propagation of electron-hole pairs optically excited in the bands of image potential at metal surfaces.

- Asseessment of the respective roles of plasmons and electron-hole pairs in two-dimensional surface bands in the screening properties of surfaces.
- Effects of electron-hole copuling on the lifetime of quasiparticles in the states of surface potential.
- Excitation of surface phonons or charge density fluctuations in scattering of atoms and molecules from metal surfaces.

Prof. B. Hellsing

COMING FROM Chalmers University (Sweden)
DATE 06/01 through 07/31/2001

Understanding of the temporal evolution of quasiparticles is of paramount importance to describe many important phenomena as the dynamics of charge and energy transfer, quantum interference, localisation and many others. It has been investigated the electron phonon interaction contribution to the lifetime of surface states on noble metals. The calculations, including the electron and phonon states of the bulk and surface, resolve the importance of the Rayleigh mode in function of temperature and binding energy of the surface electronic state.

Dr. A. Joukov

COMING FROM Institute of Solid State. Russian Academy of Sciences.
DATE 07/01/2000 through 12/31/2001

Recently studies of unidimensional magnetic materials (wires or fibers) become a topic of special interest owing to their unusual and exciting properties, such as giant magneto-impedance, magnetic bistability, elevated magnetic permeability etc. General tendency on the miniaturization of chips and sensors made from modern magnetic materials makes studies of tiny wires technologically attractive. Therefore the main attention has been paid to the study of tiny (1-50 ?m) amorphous and nanocrystalline wires.
The following problems have been studied:
- Magnetization Processes: Effect of chemical composition, applied stresses and sample geometry on magnetization curve, hysteretic properties and magnetostriction constant.
- Effect of the thermal treatments: structure and stress relaxation and nanocrystallization.
- Giant Magneto-impedance effect. Correlation of surface magnetic properties and high frequency transport properties.

Ph.D. students of UPV are involved in the development of the project.

Prof. V. Joukov

COMING FROM Institute of Solid State Chemistry.
Russian Academy of Sciences. Ekaterinbourg (Russia)
DATE 04/15/2000 through 12/31/2001

By using ab initio approaches LMTO-ASA and FP-LMTO the theoretical studies of the lifetimes of electrons excitations have been performed for Al, Cu, Ag, Au, Nb, Mo, Rh, Pd, Fe, Co, Ni. Basing on the scattering theory, a semiempirial physically transparent model has been proposed that explains the energy dependency of the averaged excitation lifetimes.

Dr. I. Koroteev

COMING FROM Institute of Strength Physics and Materials Sciences. Tomsk (Russia)
DATES 02/01through 04/30/2001 and 12/01/2001 through 12/31/2001

A necessary and important part of the adsorption theory must be a description of the electronic structure of clean surfaces and atoms when they are situated just outside the surface. As the first step of an investigation of interaction of alkaline metal atoms with metallic surfaces the electronic structure of clean vicinal surfaces has been studied. The one-dimensional model of a vicinal surface with noninteracting terraces of a varying width has been suggested. By using this model the electronic structure calculations of the Au(788) surface have been performed. It has been shown that the scattering of surface electrons by steps leads to the splitting of double degenerate surface states into the lateral confined states and into the states free propagating along terraces. Moreover the dependence of the confined level energies on the terrace width has been investigated. The spin-orbit coupling of surface states on vicinal surfaces has been considered too.

Dr. J. Kuntze

COMING FROM Institut für Experimentelle und Angewandte Physik der Universität Kiel (Germany)
DATE 06/04 through 12/31/2001

Our aim is to create and characterize lateral nanostructures using a combination of scanning tunneling microscopy (STM) in our local laboratory and photoelectron spectroscopy at synchrotron facilities. In the local lab, a UHV-system comprising a variable-temperature STM, LEED, evaporators and preparation facilities has been installed and tested. First experiments are focusing on vicinal surfaces of Si, Au and Cu. By deposition of Ag on vicinal Si a grid of one-dimensional structures can be grown which can be further used as a template for producing arrays of silver quantum dots. Growth of Ag on vicinal Au and Cu is currently under investigation. By lowering the substrate temperature we hope to change the growth conditions such that a self-assembly of Ag into an array of islands can be achieved as in the case of Co on Au. Besides fabrication and structural characterization of such nanostructures, the local electronic properties can be assessed by tunneling spectroscopy. Improved tip preparation facilities are being implemented to enhance the instrument's performance in that respect.

Dr. E. Leroy

COMING FROM Laboratoire de Materiaux Moléculaire, UMR CNRS. Lyon (France)
DATE 05/01 through 12/31/2001

Study and modelisation of the component segmental dynamics in miscible polymer blends using dielectric spectroscopy, particularcly in the case where only one component of the blend is dielectrically active, this component being either the one having the lower glass transition temperature (PVME in PVME/PS blends) or the higher one (PoCIS in PS/PoCIS blends).

Dr. C. Lorthioir

COMING FROM Laboratoire de Physique de Solides. Université Paris-Sud (France)
DATE 10/01 through 12/31/2001

Confining polymer chains within geometries of nanoscopic dimensions induces deep changes in their static and dynamic properties. The investigation of confinement effects is a challenging question of fundamental interest. In the current work, the self-confinement occurring in miscible blends of polystyrene (PS) and poly(vinyl methyl ether) (PVME), in the

high PS weight fraction regime ((PS (50%), is studied. Even though a single glass-transition temperature Tg is observed in these PS/PVME blends, the two components exhibit a strong difference in mobility, at the segmental level. Thus, close to Tg, the PS/PVME blends offer a good avenue to study fluid (PVME) chains three-dimensionally confined in a glassy (PS) matrix. The dynamics of the PVME segments is probed by broad band dielectric relaxation spectroscopy (10-3 - 107 Hz). On the other hand, neutron scattering techniques are used to characterise the structural properties of the confined systems (intermolecular structure of PS within the blends).

Dr. M. Marqués

COMING FROM Universidad de Coimbra (Portugal)
DATE 05/01through 12/31/2001

During the last years time-dependent density functional theory (TDDFT) emerged as one of the main tools to obtain excited-state properties in condensed-matter physics. It allows us to calculate linear quantities, like optical-absorption spectra, and also to tackle problems beyond the perturbative regime.
In this context, we investigate the response of molecules to light, including the calculation of optical and photo-electron spectra, photo-isomerisation, etc. We also research the interaction of systems with high-intense, ultra-short laser pulses, and the wealth of new and exciting phenomena related (high harmonic generation, above-threshold ionisation, etc.). Till now we have concentrated on small systems, like sodium, carbon and silicon clusters, but calculations of larger systems, including some biological molecules in currently under way. All these studies are performed within a real-space, real-time approach. At a more fundamental level, we test and try to improve on the exchange-correlation functional that exist in the market (these are the basic approximation in TDDFT).

Prof. I. Nagy

COMING FROM Technical University of Budapest (Hungary)
DATES 05/01 through 07/31/2000, 01/01 through 01/31/2001,
05/01 through 06/30/2001 and 09/01 through 10/31/2001

The work of Prof. Nagy during his stay at the DIPC has mostly focused on the theoretical study of the inelastic processes suffered by low-energy electrons in metals:

- Non-linear effects in the mean free path of low-energy electrons, by means of a scattering formalism. An effective particle-particle potential is used to describe the single-pair excitations.
- Spin effects in the lifetime of low-energy electrons, using first-order perturbation theory. The relative motion of the electrons, a kind of dynamical correlation effect, is included in the effective particle-particle potential.

The work of Prof. Nagy was developed in collaboration with M. Alducin, J. I. Juaristi, A. Arnau, and P. M. Echenique.

Dr. J. Osma

COMING FROM Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)
Departamento de Física de Materiales
DATE 01/01 through 02/29/2000

Lifetimes of Surface States. A metal surface generates electron states that do not exist in a bulk metal. These so-called surface states can be classified into two categories, crystal-induced (intrinsic) states and image-potential-induced (image) states. Inelastic lifetimes are obtained from the knowledge of the quasiparticle self-energy, which we compute, within the

GW approximation of many body theory, by going beyond a free-electron description of the surface. Surface-state lifetimes in noble metal surfaces are presented. The results show that actual lifetimes are highly sensitive to the details of the surface response and to the presence of the intrinsic surface state itself.

Dr. V. Popov

COMING FROM General Physics Department. Altai Technical University. Barnaul (Russia)
DATES 03/01 through 05/30/2000 and 11/01/2000 through 01/31/2001

The self-consistent band structure Green's function meted has been developed for binary paramagnetic and ferromagnetic alloys with an arbitrary long-range order parameter, n. The calculations of band structure, density of states, the Fermi surface topology, and magnetic moments have been performed for bcc Fe, fcc Ni and the Ni-Fe alloys. It was shown that for partially disordered alloys ($n<1$) the energy bands have finite width due to the electron scattering on lattice sites occupied by different atoms with probability which is directly connected to stoichiometry of an alloy. In contrast to well known self-consistent coherent potential approximation (CPA) method the Green's function method takes explicitly into account the long-range order of alloys. It was shown that this effect leads to magnetic moment that depend on n.

Dr. M. Röesler

COMING FROM Hahn Meitner Institut. Berlin (Germany)
DATES 06/01 through 06/30/2001 and 09/01 through 09/30/2001

The work of Prof. Rösler has been focused on the theoretical study of the electrons emitted in the interaction of slow ions with metal surfaces. The kinetic electron yield collected when highly-charged N ions interact with Au surfaces has been analyzed. The performed calculations show that there is no significant dependence on the initial charge state of the ion.
Electron emission spectra of H projectiles moving inside Mg targets over a wide range of energies have been analyzed as well. The charge state of the projectile is theoretically calculated by including all posible charge-transfer processes between the projectile and the target.
The work of Prof. Rösler was developed in collaboration with R. Díez Muiño, J. I. Juaristi, and F. J. García de Abajo.

Dr. S. Silkine

COMING FROM Institute of Strength Physics and Materials Science
Russian Academy of Sciences (Russia)
DATE 02/01/2000 through 12/31/2001

The theoretical investigations of dynamics of quasiparticles in the surface and image potential states for clean noble (Cu,Ag,Au,Pt) and simple (Al,Be) metal surfaces as well as Cs covered Cu(100) and Cu(111) surfaces with the use of model potential and first principles pseudopotential approaches have been performed. The calculated linewidths of quasiparticle states are in good agreement with available STM and photoemissions experimental results. For the Cs/Cu(100) and Cs/Cu(111) systems the importance of L and X band gaps of bulk Cu for the long lifetime of the excited Cs induced transient states is shown. Also the frequency- and momentum-dependent dielectric function ((q,() has been calculated for intermetallic superconductor MgB2. Two plasmon modes were found at the energies (2 and (20 eV. For the (0001) surfaces of this material our ab initio calculations reveal a variety of very clear surface and subsurface states as well as resonance image-potential states with n=1,2.

Dr. M. Voda

COMING FROM INFM. Bucarest, Magurele (Rumania)

DATE 01/01 through 12/31/2001

The scientific activities developed during the year 2001 have been mainly involved with developing a new crystal growth method for the synthesis of KPb2CL5 crystals doped with rare earth. The method combine the purification of starting compounds by chlorination of molten chlorides with <one-melting and Bridgman single crystal growth techniques.
The results about the optical properties and potential applications of these materials have been published in the "2001 Joint International Meeting of the Electrochemical Society", Sept. 3, 2001 and in a paper accepted for publication in the "Journal of Luminiscence". Recent investigations on an Ytterbium doped KPb2CL5 crystal have shown internal laser cooling in this material for the first time.

Invited Speakers

M. Nekovee
L. Seco
A. Mascaraque
A. Robin
E. Rohrer
J. Inglesfield
J.J. Quinn
P. Forrest
H. Winter
J.M. García
M.A. Cazalilla
J.M. Bletry
G. De Stasio
A. Liebsch
E. Zaremba
W. Plummer
H. Petek
J. Carlsson
B. Hellsing
N. Yamamoto

2000

A. Baró
C. Lorthioir
J. Dobson
W. Schattke
M. Van Hove
A. Lucas
D. Menzel
A. Correia
N.H. March
M. Rivas
N.H. March
J.A. Alonso
J.I. Latorre
R. Moniot
R. Barrera
E. Ortega
L. Fetters
M.S. Gravielle
A. Mugarza
A. Liebsch
S.G. Louie
M.A. Cazalilla
P. Feibelman
E. Gross
P.A. Zeijlmans
M.A. Cazalilla
B. Gumhalter
J. Blétry
F. Sols
E. Krasovskii

2001

THE SEMINARS AT DIPC

ACCLAIMED AUTHORITIES IN THE FIELD GIVE A LEADING EDGE

Formal presentations of leading edge research lines in physics, with full historical perspective, as well as overall scientific and social overviews are a key element for the education of research scientists and students alike. DIPC offers a full program of seminars by acclaimed authorities in the field. ■

2000

JANUARY 19, 2000

Quantum Monte Carlo Analysis of Exchange and Correlation in the Strongly Inhomogeneous Electron Gas

M. Nekovee (Queen Mary College, London, UK)

FEBRUARY 18, 2000

Financial risk management in non-gaussian markets

L. Seco (Toronto University, Canada)

APRIL 7, 2000

Pb/Ge(111) and Sn/Ge(111) interphases: structure, electronic properties and phase-transition

A. Mascaraque (LURE, Orsay, Paris, France)

APRIL 14, 2000

Energy loss investigations for N+ ions scattered off a Pt(110) surface under grazing incidence

A. Robin (Universität Osnabrück, Germany)

APRIL 27, 2000

Small is beautiful and powerful

E. Rohrer (IBM Laboratory, Zurich, Switzerland)

MAY 12, 2000

Friedel oscillations around subsurface impurities on GaAs(110)

J. Inglesfield (University of Cardiff, UK)

MAY 19, 2000

Composite Fermions in Quantum Hall systems: Generalization to a Multicomponent Fermion Plasma

J. J. Quinn (University of Tennessee, USA)

MAY 23, 2000

All is time: the Discrete Geometrodynamics Program

P. Forrest (University of New South Wales, Australia)

MAY 26, 2000

Effect of the projected band gap in Cu(111) on charge transfer in ion-surface scattering

H. Winter (Humboldt Universität, Berlin, Germany)

JUNE 5, 2000

Self-assembled nanostructure fabrication by Molecular Beam Epitaxy for opotoelectronic applications: Quantum Dots, Quantum Rings and Quantum wires

J. M. García (Instituto de Microelectrónica de Madrid, CNM-CSIC, Spain)

JUNE 14, 2000

Why 'one dimensional' is different

M. A. Cazalilla (Brown University, Rhode Island, USA)

JUNE 26, 2000

The glass transition in tetrahedric compounds

J. M. Bletry (INST, CEA, Grenoble, France)

JUNE 30, 2000

Synchrotron Spectromicroscopy: how medicine, biology and physics can benefit from a physics technique

G. De Stasio (University of Wisconsin, USA)

JULY 6, 2000

Quantum well behaviour without confining barrier revealed via dynamic screening in thin alkali metal films

A. Liebsch (FZ-Jülich, Germany)

JULY 11, 2000

Dynamics of Bose-condensed trapped atomic gases

E. Zaremba (Queen's University, Canada)

SEPTEMBER 4, 2000

The dynamical role of defects in 2D phase transitions: from charge density waves to defect density waves

W. Plummer (University of Tennessee, USA)

SEPTEMBER 4, 2000

Ultrafast two-phonon photoemission studies of the alkali atom dynamics on noble metal surfaces

H. Petek (Advanced Research Laboratory. Hitachi Ltd, Japan and University of Pittsburg, USA)

SEPTEMBER 15, 2000

Electronic structure of bulk and polar surfaces of ZnO

J. Carlsson (Chalmers University, Sweden)

SEPTEMBER 18, 2000

Electron-Phonon Coupling; some historical aspects and lifetimes

B. Hellsing (Chalmers University, Sweden)

DECEMBER 19, 2000

Photon emission from silver particles induced by high energy electrons

N. Yamamoto (Tokyo Institute of Technology, Japan)

2001

JANUARY 18, 2001

Conductivity in nanowires

A. Baró (Universidad Autónoma de Madrid, Spain)

MARCH 21, 2001

Local order and dynamics in confined polymers: the case of block copolymers

C. Lorthioir (Laboratoire de Physique de Solides. Université Paris-Sud, France)

APRIL 3, 2001

Van der Waals forces and time dependent density functional theory

J. Dobson (Griffith University, Australia)

MAY 3, 2001

Electronic structure from photoemission (ARUPS): tools, accuracy, and new materials

W. Schattke (Universität Kiel, Germany)

MAY 3, 2001

Holography with photoelectrons

M. Van Hove (Lawrence Berkeley National Laboratory, California, USA)

MAY 7, 2001

From what is Light to what is Life: an account of how X-rays cracked the structure of DNA

A. Lucas (Fundp Namur, Belgium)

MAY 9, 2001

Heisenberg and the Uranium Club under Nazi Germany

A. Lucas (Funp Namur, Belgium)

MAY 23, 2001

Ultrafast charge transfer at surfaces from core spectroscopies

D. Menzel (Teshnische Universität München, Germany)

MAY 25, 2001

PHANTOMS: Nanotechnology Network for Information Processing and Storage

A. Correia (CMP Cientifica S.L., Las Rozas, Madrid, Spain)

MAY 29, 2001

Quantal Wigner electron solids with and without magnetic fields

N. H. March (Universiteit Antwerpen, Belgium)

JUNE 4, 2001

Kinematical Theory of Spinning Particles: Classical and Quantum Mechanical Formalism of Elementary Particles

M. Rivas (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

JUNE 5, 2001

Electron correlation in atoms, molecules and condensed phases

N. H. March (Universiteit Antwerpen, Belgium)

JUNE 8, 2001

Electronic shell effects in metallic clusters and their consequences for cluster self-assembling

J. A. Alonso (Universidad de Valladolid, Spain)

JUNE 18, 2001

Computación cuántica: Estados cuanticost

J. I. Latorre (Universitat de Barcelona, Spain)

JUNE 18, 2001

Computación cuántica: Entanglement

J. I. Latorre (Universitat de Barcelona, Spain)

JUNE 19, 2001

Computación cuántica: Teleportación

J. I. Latorre (Universitat de Barcelona, Spain)

JUNE 19, 2001

Computación cuántica: Encriptación quántica

J. I. Latorre (Universitat de Barcelona, Spain)

JULY 2, 2001

Ethical Issues of the Desktop Metaphor

R. Moniot (Fordham University, New York, USA)

JULY 3, 2001

Does an effective index of refraction in granular matter always exist?

R. Barrera (Universidad Autónoma de México, Mexico)

JULY 6, 2001

Electronic states at step superlattices

E. Ortega (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

JULY 9, 2001

The Packing Length. A Basis for Melt State Rheological Parameters

L. Fetters (Jülich IFF, Germany)

JULY 24, 2001

Energy and electron spectra after ion-surface collisions

M. S. Gravielle (Universidad Nacional de Buenos Aires, Argentina)

JULY 25, 2001

Lifetime of surface states confined on terraces of a vicinal Au (111) surface

A. Mugarza (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

JULY 26, 2001

Do plasmons live longer than electron-hole pairs?

A. Liebsch (FZ-Jülich, Germany)

JULY 27, 2001

Optical properties of materials

S.G. Louie (University of California, Berkeley, USA)

AUGUST 3, 2001

The Kondo effects in quantum dots

M.A. Cazalilla (Brown University, Rhode Island, USA)

AUGUST 8, 2001

Time dependant phenomena in quantum dots

M.A. Cazalilla (Brown University, Rhode Island, USA)

SEPTEMBER 5, 2001

How water wets metal surfaces

P. Feibelman (Sandia National Laboratory, Alburquerque, New Mexico, USA)

SEPTEMBER 6, 2001

Atoms and molecules in strong lases pulses: simulations far from equilibrium

E. Gross (Physikalisches Institüt der Universität Würzburg, Germany)

SEPTEMBER 24, 2001

Interactions of Metastable He atoms with single crystals surface

P.A. Zeijlmans (Debye Institue, Utrecht University, Netherlands)

SEPTEMBER 28, 2001

Junction of two Luttinger liquids out of equilibrium: a time-dependent DMRG study

M.A. Cazalilla (Brown University, Rhode Island, USA)

NOVEMBER 14, 2001

Quantum model of heat transfer in inelastic atom-surface scattering: comparsion of theory with experiment

B. Gumhalter (Institute of Physics of the University of Zagreb, Croatia)

NOVEMBER 26, 2001

Historia de las técnicas y de las investigaciones de los vidrios"

J. Blétry (Commissariat a l'Energie Atomique (CEA), INSTN, Grenoble, France)

DECEMBER 4, 2001

Condensación de Bose-Einstein"

F. Sols (Universidad Autónoma de Madrid, Spain)

DECEMBER 21, 2001

Spectroscopy of bulk and semi-infinite crystals by the Extended LAPW-kp method

E. Krasovskii (Institute for Theoretical Physics Christian-Albrechts-University Kiel, Germany)

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
Prof. J. Colmenero (Universidad del País Vasco / Euskal Herriko Unibertsitatea,Spain)
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?**

PARTICIPANTS

A. Alegría ..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)
F. Alvarez..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)
A. Arbe..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)
U. Buchenau..... IFF, Forschungszentrum Jülich GmbH (Germany)
I. Campbell ..... Université Montpellier (France)
J. Colmenero..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)
A. Christiane ..... Université Paris-Sud (France)
C. Dreyfus ..... Université Pierre et Marie Curie, Paris (France)
B. Farago..... Institut Laue-Langevin. Grenoble (France)
E. W. Fischer ..... Institut für Physik. Johannes-Gutenberg Universität (Germany)
B. Frick..... Institut Laue-Langevin. Grenoble (France)
S. Glotzer ..... National Institute of Standards and Technology, Maryland (USA)
J. Kieffer ..... University of Illinois (USA)
S. Kahle..... IFF, Forschungszentrum Jülich GmbH (Germany)
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D. N. Teodorou ..... University of Patras (Greece)
P. Winfried..... Universität München (Germany)
P. Wolfgang..... Universität Johannes-Gutenberg (Germany)
J. Wuttke..... Technische Universität München (Germany)
R. Zorn ..... IFF, Forschungszentrum Jülich GmbH (Germany)

WORKSHOP

Image States and Electron Lifetimes in Solid

JUNE 25-27, 2000

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

Program committee
Prof. Th. Fauster (Universität Erlangen, Germany)
Prof. U. Höfer (Philipps Universität, Marburg, Germany)

Secretary
Dr. E. Ortega (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

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**

PARTICIPANTS

W. Berthold ..... Max Planck Garching (Germany)

K. Boger ..... Universität Erlangen (Germany)

E. V. Chulkov ..... Universidad del País Vasco
Euskal Herriko Unibertsitatea (Spain)

M. Donath ..... Universität Muenster (Germany)

H. Duerr ..... Forschungszentrum Jülich (Germany)

P. M. Echenique ..... Universidad del País Vasco
Euskal Herriko Unibertsitatea (Spain)

W. Eckardt ..... Max Planck Institut, Berlin (Germany)

T. Fauster ..... Universität Erlangen (Germany)

C. Gahl ..... Max Planck Institut, Berlin (Germany)

A. Gerlach ..... Universität Kassel (Germany)

A. Goldman ..... Universität Kassel (Germany)

C. Harris ..... University of California, Berkeley (USA)

F. Himpsel ..... University of Madison, Wisconsin (USA)

U. Hoefer ..... Philipps Universität, Marburg (Germany)

A. Hotzel ..... Cornell University, New York (USA)

R. Keyling ..... Max Planck Institut, Berlin (Germany)

E. Ortega ..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)

R. Osgood ..... Columbia University, New York (USA)

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P. Saalfrank ..... University College London (UK)

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C. Voelkmann ..... Philipps Universität, Marburg (Germany)

M. Weinelt ..... Universität Erlangen (Germany)

M. Wiets ..... Universität Erlangen (Germany)

M. Wolf ..... Max Planck Institut, Berlin (Germany)

WORKSHOP

Interaction of Light with Matter

JULY 26-29, 2000

Program committee
Prof. P. Apell (Chalmers University of Technology and University of Göteborg, Sweden)
Dr. J. Aizpurua (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

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**

PARTICIPANTS

J. Aizpurua ..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)

M. Alducin ..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)

F. Alvarez ..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)

E. Anisimovas ..... University of Lund (Sweden)

P. Apell ..... Chalmers University of Technology (Sweden)

A. Arnau ..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)

R. Berndt ..... Universität Kiel (Germany)

P. Dawson ..... Queen's University of Belfast (Northern Ireland)

A. Downes ..... Université de Marseille (France)

F. J. Garcia Vidal ..... Universidad Autónoma de Madrid (Spain)

P. Guaino ..... Université de Marseille (France)

G. Hoffmann ..... Universität Kiel (Germany)

P. Johansson ..... University of Lund (Sweden)

A. Rivacoba ..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)

A. Rubio ..... Universidad de Valladolid (Spain)

F. Silly ..... CEA-Saclay, Service de Recherche sur les Surfaces et l'Irradiation de la Matière (France)

A. Wiegand ..... Queen's University of Belfast (Northern Ireland)

N. Zabala ..... Universidad del País Vasco / Euskal Herriko Unibertsitatea (Spain)

WORKSHOP

Recent Research on Novel Magnetic Structures and Their Applications

SEPTEMBER 18-19, 2000

Chairmen
Prof. J. González (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)
Dr. A. Zhukov (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

Program committee
G. R. Aranda (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)
C. Miguel (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

Treasurer
J. M. Blanco (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

Secretary
A. F. Cobeño (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)

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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S. Bennington ..... Rutherford Appleton Laboratory (United Kingdom)
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WORKSHOP

Photonic Materials for the New Century

MAY 27-31, 2001

Program committee
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Prof. F. Mesenguer (Unidad Asociada CSIC-Universidad Politécnica Valencia, Spain)

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

L. Viña
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

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

Program committee
Prof. Th. Fauster (University of Erlangen-Nüremberg)
Prof. U. Höfer (University of Marburg)
Prof. H. Petek (University of Pittsburg, USA)
Prof. M. Wolf (Freie Universität, Berlin)

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

Vice Chairman
Prof. A. Howie (University of Cambridge, UK)

Program committee
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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

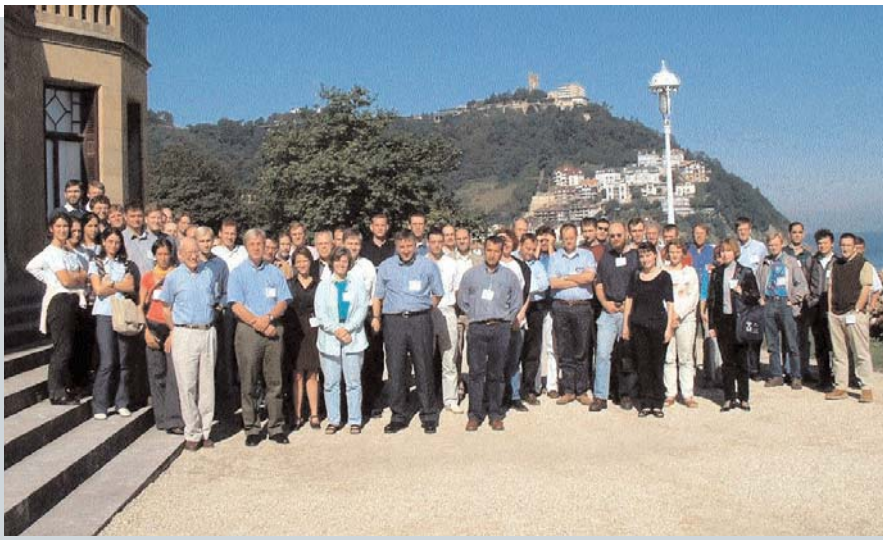
M. Moseler
Surface processing with cluster beams and liquid nanojets

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*)
Prof. O.H. Crawford (Oak Ridge National Laboratory, USA)
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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?**

PARTICIPANTS

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M. Roesler ..... Hahn-Meitner Institut, Berlin (Germany)

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H. Winter ..... Humboldt-Universität Berlin (Germany)

N. Zabala ..... Universidad del País Vasco/Euskal Herriko Unibertsitatea (Spain)

P. Zeijlmans van Emmichoven ..... Utrecht University/Debye Institute (Holland)

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.

PARTICIPANTS

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

J. Colmenero..... DIPC, Universidad del País Vasco/Euskal Herriko Unibertsitatea (Spain)

A. Khokhlov ..... Moscow State University (Russia)

F. Mezei ..... HMI Berlin (Germany)

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

D. Richter..... FZ Jülich (Germany)

J. Rieger ..... BASF Aktiengesellschaft, Polymer Physics (Germany)

P. Schurtenberger ..... University of Fribourg (Switzerland)

R. K. Thomas ..... Physical Chemistry Laboratory, Oxford (UK)

LECTURES FOR THE GENERAL PUBLIC

PROMOTING THE SOCIAL AWARENESS OF SCIENCIFIC ACTIVITY

The increasing influence of scientific and technological advances on our attitudes, communication and lifestyle especially requires a matching offer of information by active scientists and communicators. In addition to leading research, the Foundation hosts a number of events promoting social awareness of science and the wider implications of scientific activity. This important task is expected to expand by the use of modern interactive techniques and online colloquia. ■

LECTURE

Twentieth Century's Scientific Legacy

NOVEMBER 22-23, 2000

Program committee
P. M. Echenique (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)
F. Ares (Miramon.kutxaEspacio de la Ciencia, Spain)
I. Tellería (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)
J. J. del Val (Universidad del País Vasco / Euskal Herriko Unibertsitatea, Spain)
E. Zabala (Ondarroa BHI, Spain)

47 and 38 years; these were the average life expectancies for men and women, respectively, in Europe in the year 1900, when 18% of newborns died before one year. Today, men die on average, at 73, women at 80, and the infant mortality rate is below 1% in developed countries. This is because, a century ago, having a burn or a deep cut, suffering appendicitis or giving birth to a child were enough to put the human being at the risk of death because of infections. If someone became ill or injured, the survival chances depended both on physic strength and luck. Nowadays, the risk of infection is not smaller but we have antibiotics to save our lives. We are so used to the benefits of science and its daughter technology that we think they have always been there.

Nevertheless, roughly one hundred years ago, neither the aspirin nor the antibiotics or the contraceptive pill existed —could you imagine a simple tooth extraction without anaesthesia?— any surgery involved high risk for the patient; there were no drinking water, drainage or utilities; everyone had to commute on foot or by animal traction transports to move from one place to another except the privileged living in cities where the railroad stopped; telephone, radio, TV and cinema did not exist; newspapers hardly arrived; eating fish and meat were luxuries that only a few could afford, and it was impossible to get fresh fish at any price far from the coast because it arrived in awful conditions due to the slowness of transport systems. Our standard of living has improved more in the last century than in the previous ten.

Such remarkable change, in such a short period of time, has happened due to the technological development associated to the advances in basic science since the end of the nineteenth century. However, young people do not always perceive the direct connection between science and welfare.

Our autonomous region's future mainly depends on the young people from where tomorrow's researchers and technologists will arise, and on their understanding of the contributions that science has done and has to do.

But science is much more than its practical applications. Essentially, it is a new intelectual

adventure, an essential part of modern culture that has changed our conception of the world and of ourselves in the last hundred years.

We have discovered that time and space emerged from a big explosion about 15 billion years ago, that ours is only a small planet in the outlying area of a big galaxy of hundreds of thousands of millions, that all living organisms on earth are related, that we come from the same molecule whose evolution has given rise to the biodiversity we know, that we have this molecule (DNA) in all of our cells like a living book of the evolution of earth, that matter is much more complex than the simple addition of atoms, that continents move... "we are" —as the late Carl Sagan stated— "the way in which cosmos knows itself", and science is our compass to come through the adventure of knowledge safely.

Secondary Education teachers play a key role in relaying correct information to new generations and the importance of looking for answers in the search of knowledge. For these teachers, to help them in their essential work, a series of conferences have been organized, under the general title of "Twentieth Century's Scientific Legacy". We hope that their hard job will benefit from it.

CONTRIBUTIONS

I. Oliveri (Former Minister of Education, Basque Government)
Opening remarks

G. Morata (Molecular Biology Center, C.S.I.C.)
The Gene

F. Plazaola (Universidad del País Vasco / Euskal Herriko Unibertsitatea)
The Atom and its Atomic Structure

P. M. Echenique (Universidad del País Vasco / Euskal Herriko Unibertsitatea)
Advances in Biology and Medicine

J. A. Garrido (Iberdrola)
Twentieth Century. The Triumph of Technology

F. Anguita (Universidad Complutense de Madrid)
Future in Space: Mars and Beyond

J. J. Iruin (Universidad del País Vasco / Euskal Herriko Unibertsitatea)
Twentieth Century Molecules

J. M. Sanz (Universidad de Valladolid)
Advances in Mathematics

A. Galindo (Universidad Complutense de Madrid)
Origin and End of the Universe

J. L. Arsuaga (Universidad Complutense de Madrid)
Men's Evolution and Future

F. Ares (Miramon Kutxaespacio de la Ciencia)
Computers and Miniaturization

PARTICIPANTS

92 Secondary Education teachers attended the conferences. Their names and respective schools are indicated below.

M. C. Arana, J. Ariceta, E. Rubio ..... Bidebieta BHI (San Sebastián)

M. N. García ..... I. B. Miguel de Unamuno (Bilbao)

I. Gárate ..... Motrico BHI (Motrico)

R. Cerrillo ..... San Alberto Magno (San Sebastián)

M. D. Echebeste ..... I. B. Aixerrota (Getxo)

D. Cohen ..... American School (Bilbao)

J. Ibarra ..... Beurko BHI (Baracaldo)

A. Juaristi ..... Koldo Mitxelena BHI (Renteria)

M. Arregi, A. Gardoki ..... T. Aranzadi Ikastola (Vergara)

M. Folch, M. A. García de la Yedra ..... Inst. Politecn. Easo (San Sebastián)

I. Lakunza, A. Mondragón ..... Laskorain Ikastola (Tolosa)

A. Echarri ..... CEIDA-DONOSTIA (San Sebastián)

C. Badiola, M.G. Iriarte ..... JMª Iparraguirre BHI (Urretxu)

M. Imaz, M. Usatorre ..... Zuazola-Larraña BHI (Oñate)

M. Pascual ..... IES Leizarán BHI (Andoain)

E. Arana ..... IB Alza (San Sebastián)

J. Sarasola ..... Txorierri B.H.I. (Derio)

I. Korkostegi ..... IB Arrasate (Arrasate)

A. M. Iturrioz ..... Beurko BHI (Baracaldo)

I. Zeberio ..... Gabriel Aresti BI (Getxo)

C. Pérez ..... Aixerrota BHI (Getxo)

M. Antxia, I. Kerxeta ..... FJ Zumarraga BI (Durango)

A. M. Ayesta ..... Andra Mari Institutoa (Galdacano)

A. M. Ruiz ..... Arratiako Instituoa (Arrigorriaga)

A. Uriz ..... Elgoibar BHI (Elgoibar)

M.R. Alberdi, R.M. Fernández, S. Gaecía, M. T. González,
M. Los Santos, M. A. Maculet, J. M. Pineda, J. Valiente ..... IES Usandizaga (San Sebastián)

I. Gutierrez, J. C. Lizarazu ..... La Anunciata (San Sebastián)

M. A. Fernández ..... Aixerrota BI (Getxo)

M.T. Santos ..... COP (Rentería)

A. Albisu, P. Aseginolaza, M. Badiola,
J.J. Huerta, A.I. Villaluenga ..... Txindoki Alkartasuna BI (Beasain)

T. Arano, M. Eceiza ..... Orixe BHI (Tolosa)

C. Ahechu, A. Dompedro,
M. J. Ruiz de Ocenda, G. Sánchez ..... Koldo Mitxelena IB (Rentería)

F. Fouz ..... COP Donostia (San Sebastián)

J. Etxeberria, A. Vélez ..... San Benito Ikastola (Lazkano)

M. Pérez ..... IBD-UBI (San Sebastián)

R. Azcona ..... Talaia BHI (Hondarribia)

J. Gallego ..... Oianguren BHI (Ordizia)

J. Juni ..... Koldo Mitxelena BHI (San Sebastián)

A. Lekunberri ..... IES Aniturri BHI (Agurain)

T. Imaz ..... Agustin Iturriaga-Labaka IB (Hernani)

J.A. Andrés ..... Antigua BHI (San Sebastián)

M. Mart'nez ..... IES Lasarte-Usurbil BHI (Lasarte)

M. Lizeaga ..... Antigua BHI (San Sebastián)

P. Legorburu ..... Iurreta BHI (Iurreta)

M.M. Celarain ..... Txindoki-Alkartasua Institutua (Beasain)

J.M. Lopez ..... Oianguren Institutoa (Ordizia)

M. P. Martinez de Eulate ..... IES Usandizaga (San Sebastián)

M. D. Badiola ..... Bidebieta BHI (San Sebastián)

M. Irizar ..... I.B. Tailaia (Hondarribia)

I. Zapirain ..... I.B. Lezo (Lezo)

E. Bañales ..... El Regato (Portugalete)

A. Gil ..... COP Vitoria (Vitoria)

J. A. Apiñaniz ..... I.E.S. Francisco de Vitoria B.H.I (Vitoria)

LECTURE

Climate Change

OCTOBER 25-26, 2001

Organizers
Donostia International Physics Center
Ilustre Colegio Oficial de Físicos Bilbao, Madrid

Collaborators
Aquarium Donostia-San Sebastián

Earth's atmosphere is exposed to continuous change. Cyclically its temperature and composition vary to obtain a continuous self-regulation. Climate is a complex system. Atmospheric behavior may be altered by volcanic eruptions, oceans, polar icecaps or by the biosphere. Lately, there have been rapid changes which force us to think climate changes are a consequence of human activity. We live in a society in which industrial activities, combustion of fossil fuels, and car and airplane engines release large quantities of gases into the atmosphere obstructing the remains of solar radiation returning to space. This is the "greenhouse effect".

The increase of gas emissions like (CH4) Methane, (CO2) Carbon Dioxide, together with (SO2) Sulphur Dioxide, (N2O) Nitrous Oxide and Halo carbides (CFF1 and CFC 12) create global warming and an elevation in the level of the sea.

Assuming this is so, ice masses of the polar icecaps could melt. The level of the oceans will increase and therefore coastal areas and deltas would be flooded. Many animal species will be displaced from their natural habitats. The number of tropical illnesses will increase and move toward more temperate areas. According to Hadley Center, Spain will be one of the countries that will suffer these consequences. The Mediterranean beaches, in the Saler (Valencia) and the Cantabrian coastline are in danger of extinction.

In this 1st Workshop on Climate Change the invited experts create awareness of the problems brought on by climate change.

CONTRIBUTIONS

L. Balairón (Instituto Nacional de Meteorología, Spain)
The scientific basis of climactic change and greenhouse gases emissions scenarios on XXI Century

D. Viner (University of East Anglia, United Kingdom)
The construction and application of climate change data for impacts and policy assessments: communicating uncertainty

E. Zorita (Institut für Kuestenforschung, Germany)
The Ocean-Atmosphere interaction

Millán (Centro de estudios ambientales del mediterráneo, Spain)
Climactic Change scenarios: Rain impacts in South Europe

C. Rodríguez (Universidad de Salamanca, Spain)
The climate variability: Thermic impact of climactic change in the Basque Country

A. Iglesias (Universidad politécnica de Madrid, Spain)
Impacts on agriculture

J. Nieto (Confederación de Medio Ambiente y Salud Labora, Spainl)
Social impacts of climactic change

J. Rekondo (*El Correo*, Spain)
International and European response to Kioto effects
Debate: Society, Media and Climactic Changes
Moderator: *G. Echagüe* (Ilustre Colegio Oficial de Físicos, Spain)
Participants: *L. Balairón, A. Iglesias, M. Millán, J. Nieto, J. Rekondo, C. Rodríguez, E. Zorita*

PARTICIPANTS

There were 86 participants that came from diverse disciplines:

- 25 university teachers and teachers of Highest Formative Cycles
- 35 university students from science faculties and Environment Health cycles
- Researchers
- Fellows
- Technicians from the Basque Government
- Experts in environmental areas
- Experts from the Harbour Authorities of Pasajes, Spain