

INSIDE REPORTING ON 2004/05

WELCOME TO THE DIPC FOUNDATION	5
OUR PATRONS	9
GLOBAL APPEAL IN SAN SEBASTIAN ALBERT EINSTEIN ANNUS MIRABILIS 2005	11
RESEARCH ACTIVITY	17
SCIENTIFIC HIGHLIGHTS	19
DIPC PUBLICATIONS 2004/05	51
OUR RESEARCHERS	71
VISITING RESEARCHERS	81
THE SEMINARS	93
THE WORKSHOPS	103



WELCOME TO THE DIPC FOUNDATION

Continuing to promote and facilitate the development of basic and oriented research in materials science.

Donostia International Physics Center (DIPC) Foundation was created in 1999, as a fruit of foresighted collaborations between the Departments of Education and Industry of the Basque Government, the University of the Basque Country, the Provincial Authority of Gipuzkoa, the Town Hall of San Sebastian and the savings bank, Kutxa of San Sebastian and Gipuzkoa.

DIPC started as an intellectual center with the principal aim of promoting and facilitating the development of basic and oriented research in materials science to the highest level. DIPC has therefore been open and associated to the University of the Basque Country and an internationalization platform for basic science in the Basque Country in the field of materials science.

In order to meet these goals, in the first consolidation stage, three basic programs were established:

1. Visiting Researchers Program
2. International Workshops Program
3. General Science Communication Program

The aim of the **Visiting Researchers Program** was to attract the best scientists in the field of materials science. Thus, an interaction platform between researchers of high recognition from other countries and our researchers was established. From this platform, the emergence of new joint project proposals would not only be favored but the creation of an international network which allows for a better understanding and diffusion of our own scientific activity.

We will strengthen our future scientific capabilities by building synergies and partnerships with other centers and institutions of our environment.

The **International Workshops Program** was intended to create new platforms for debate in which experts from different arenas but with common goals would contribute to the resolution of hot topics. Rather than adopting the conventional format of a conference, informal meeting with a reduced number of invited scientists was preferred in order to provide plenty of free time for discussions.

Finally, the **General Science Communication Program** was intended to bring the world of science to the public. The social implication of this program is evident at a time when science and technology play a crucial role for the future of our world.

After six years, we can say that the objectives we set from the start have been accomplished. In this period, DIPC has become a center of reference in basic research of **Materials Physics**. The relevance is supported by the quality of the researchers who have visited the center, the international level of the workshops held and most of all, the importance of the scientific contributions derived from the research activity. For instance, during the period of the time of this report, 2004/05, 235 original papers have been published in journals such as, *Physical Review Letters* (26 papers) and *Physical Review* (67 papers). This means that the contribution in 2004/05 from DIPC in these journals is in the

order of 7% of the total contribution by Spanish institutions. This is quite an achievement for such a young institution.

It is also important to note the launching of the **Fellows Guipuzkoa**. This program, under the financial support of the Provincial Authority of Guipuzkoa, allows young scientists, mostly from the Basque Country, who have been working abroad, to return. DIPC acts as a "landing platform" by means of a five-year contract.

Along the same line of development, we can include the creation of our in-house Computation Center. The first phase of this center was inaugurated in July 2003 with the aim of becoming an international reference in complex computational physics and materials simulation. After about three years, our Computation Center is approaching its equilibrium stage of operation. We hope that the center will become one of the basic pillars for future developments of scientific activity at DIPC through continuous updates in hardware.

In addition to DIPC's scientific level, it is also gained recognition internationally as a center of innovation, as other universities and research centers have recently shown interest in our model of operation.



Juan Colmenero de León
General Director

Pedro Miguel Echenique Landiribar
President

Alberto López Basaguren
Secretary

Spurred by these remarkable results, we now face the challenge of developing DIPC into a powerful center for basic research and to strengthen our capabilities. The main goal for the near future is the creation of a critical mass of staff researchers at DIPC. The idea does not consist of repeating the schemes of other centers, with permanent staff positions, but of habilitating medium term contract staff (one to three years) in numbers which would allow for the proper exploitation of existing know-how and resources. In order to reach this objective, over last two years we have developed a postdoctoral and PhD contract grant program. These new programs, along with the established Fellows Guipuzkoa, and the external grant systems, will enable for the attainment of a critical mass of researchers based at DIPC. New spaces must be made available, which will involve the refurbishment of the fourth building at the DIPC premises.

Moreover, we will strengthen our future scientific capabilities by building synergies and partnerships with other centers and institutions of our environment. In particular with the Materials Physics Department of the University of the Basque Country, the Materials Physics Institute (joint center of the University of the Basque Country (UPV/EHU) and the Spanish Research Council (CSIC)) and the recently created Nanogune network. We believe this is the route to maintain our ranking on the European and international scene.

Last but not least, we plan to continue publicizing the latest scientific developments and giving young people a taste for science in the framework of our General Science Communication Program. A successful example was the conference organized around Albert Einstein's work and personality in September of 2005, where six Nobel laureates shared the passion for research with over 750 attendants. ■



BASQUE GOVERNMENT
 DEPARTMENT OF INDUSTRY, COMMERCE AND TOURISM
 DEPARTMENT OF EDUCATION, UNIVERSITIES AND RESEARCH
 EUSKO JAURLARITZA
 INDUSTRIA, MERKATARITZA ETA TURISMO SAILA
 HEZKUNTZA, UNIBERTSITATE ETA IKERKETA SAILA
 GOBIERNO VASCO
 DEPARTAMENTO DE INDUSTRIA, COMERCIO Y TURISMO
 DEPARTAMENTO DE EDUCACIÓN, UNIVERSIDADES E INVESTIGACIÓN



Universidad del País Vasco

UNIVERSITY OF THE BASQUE COUNTRY
 EUSKAL HERRIKO UNIBERTSITATEA
 UNIVERSIDAD DEL PAÍS VASCO



Gipuzkoako Foru Aldundia
 Diputación Foral de Gipuzkoa

PROVINCIAL AUTHORITY OF GIPUZKOA
 GIPUZKOAKO FORU ALDUNDIA
 DIPUTACIÓN FORAL DE GUIPUZCOA



Donostiako Udala
 Ayuntamiento de San Sebastián

SAN SEBASTIAN TOWN HALL
 DONOSTIAKO UDALA
 AYUNTAMIENTO DE SAN SEBASTIÁN



kutxa

KUTXA



TELEFÓNICA



NATURGAS ENERGÍA GRUPO S.A.

OUR PATRONS

The Board is the principal governing body of DIPC.

BASQUE GOVERNMENT
José Antonio Campos Granados
 Minister of Education, Universities and Research

Jon Barrutia Guenaga
 Vice Counselor of Universities and Research

Alfredo Zalaya Pérez
 Director of Science Policy

José Ignacio Tellechea Fernández
 Vice Counselor of Competitivity

Joseba Jaureguizar Bilbao
 Director of Technology and Innovation

Ana Aguirre Zurutuza
 Counselor of Industry, Commerce and Tourism

UNIVERSITY OF THE BASQUE COUNTRY
Juan Ignacio Pérez Iglesias
 Rector

Miguel Angel Gutiérrez Ortiz
 Vice Rector of Research

PROVINCIAL GOVERNMENT OF GIPUZKOA
Joxe Joan González de Txabarri Miranda
 President

Joaquín Villa Martínez
 Statutory Deputy of the Department for Innovation and the Society of Knowledge

José Ramón Guridi Urrejola
 General Representative for the Promotion of Innovation and Knowledge

SAN SEBASTIAN TOWN HALL
Odón Elorza González
 Mayor

KUTXA
Félix Ares de Blas
 General Director
 Miramon.KutxaEspacio de la Ciencia

TELEFÓNICA
César Alierta Uzué
 President

NATURGAS ENERGÍA GRUPO S.A.
Manuel Menéndez Menéndez
 President