

REPORT: WORLD YEAR OF PHYSICS

ANY DE LA FÍSICA

2004.05UAB

2005 was declared the World Year of Physics to commemorate the 100th anniversary of the publishing of three articles written by Albert Einstein that are essential for contemporary science. The UAB also has decided to commemorate this event and declare the 2004-2005 academic year the Year of Physics, with the aim of making the university community aware of the history of this discipline, its aims for the future and also the many consequences it has on society, environment, art and literature.

Tacitus wrote: “Ipsa multarum artium scientia, etiam aliud agentes nos ornat”, that means “Knowing many sciences is in itself an ornament for us, even though we work in a completely different field”. So here you have, written in old words, one of our main objectives: At the end of the academic year, let everyone add the pearl of physics to their cultural necklace.

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Presentació

2005 was declared by the UNESCO as the World Year of Physics, with the aim of promoting the spreading of and public meditation on this branch of science, which has been so important for society, and yet has passed unnoticed. The reason for this is the 100th anniversary since the publishing of Einstein's articles on the special theory of relativity and on the quantum nature of light, which are the origin of two important conceptual revolutions and, later on, technological.

The UAB has joined this celebration devoting the 2004-2005 academic year to physics with the main objective of incorporating scientific culture into the general academic and cultural guidelines of the university.

The Year of Physics began on the 30th September, the day when the UAB 2004-2005 academic year began with an inauguration lecture by Dr. Josep Antoni Grífols, professor in Theoretical Physics, titled: “The Big Bang: a cosmology for the 21st Century”

Activities programmed throughout the Year of Physics deal with this discipline from three complementary approaches: its limits in the research for new knowledge, its impact on thinking and arts, and on society as the basis of technologies that deeply transform lifestyle. Knowing, expressing, living: the part of physics that goes beyond specialty, that opens new horizons, broadens one's imagination and reality, that becomes the driving force of economy and boosts culture.

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Cicle de conferències

Academic activities programmed throughout the Year of Physics deal with this discipline from three complementary approaches: its limits in the research for new knowledge, its impact on thinking and arts, and on society as the basis of technologies that deeply transform lifestyle. Knowing, expressing, living: the part of physics that goes beyond specialty, that opens new horizons, broadens one's imagination and reality, that becomes the driving force of economy and boosts culture.

Therefore, activities are divided into three different areas, all of which are accessible to people who are not specialists in this field: An activity every day related to the boundaries of knowledge, through a series of conferences grouped under the name: **Physics and the boundaries of knowledge**; a series of dialogs on different aspects about the link between physics and arts and thinking with the name: **Physics and arts**; together with debates about current issues on physics that have a great impact on the future of society, that is why they've been called: **Physics and society**. Before each of these debates, there will be the passing of a specially relevant film, that will be an aide to underline the view on the problem of current imaginary.

Agenda for each group of activities

- **Physics and the boundaries of knowledge**
- **Physics and arts**
- **Physics and society**

PHYSICS AND THE BOUNDARIES OF KNOWLEDGE

Series of conferences

Einstein and the goatherds

Tuesday: 19th October 2004 (18 h. Auditorium, Rectorship building).

SPENCER WEART: Director of the Center for History of Physics at the American Institute of Physics (AIP)

Quantum mechanics; the essential work of human thinking?

Tuesday 2nd November 2004 (18 h. Auditorium, Rectorship building)

ALBERT BRAMON: Professor in Theoretical Physics at the UAB

The rebellion of forms

JORGE WAGENSBERG: Director of CosmoCaixa Barcelona and professor at the UB
Monday 15th November 2004 (18h. Auditorium, Faculty of Science)

Particle physics at the turn of the XXI Century

JONATHAN R. ELLIS: Researcher at the European Organisation for Nuclear Research (CERN)
Tuesday 30th November (18h. Auditorium, Rectorship building)

Superconductivity: nanotechnology to stop climate change

XAVIER OBRADORS & TERESA PUIG: Research professors at the Institut de Ciència de Materials de Barcelona (CSIC)
Tuesday 11th January 2005 (18h. Auditorium, Rectorship building)

What interests nanotechnology physicists most is everything that isn't physics

VICTOR F. PUNTES: Professor at the Department of Fundamental Physics of the UB
(Auditorium, Rectorship building)

Complex systems

RICARD V. SOLE: Research professor at ICREA and at the UPF
Tuesday 8th March 2005 (18h. Auditorium, Rectorship building)

The arrow of time:

PAUL DAVIES: Professor at the Australian Centre for Astrobiology (Macquarie University)
Wednesday 16th March 2005 (12h. Auditorium, Rectorship building)

Astrobiology: the scientific search for life in the universe

JUAN PEREZ MERCADER: Director of the Centro de Astrobiología (INTA-CSIC)
Thursday 21st April 2005 (18h. Auditorium, Rectorship building)

The latest news from Titan

TOBIAS OWEN : Professor at the Institute for Astronomy of Hawaii University
Tuesday 5th April 2005 (18h. Auditorium, Rectorship building)

The (XX) Century of physics: science and society

JOSÉ M. SÁNCHEZ RON: Professor of History of Science at the Universidad Autónoma de Madrid
Wednesday 11th May 2005 (18h. Auditorium, Rectorship building)

Fuzzy portraits of the World: between classic physics and (post)modern physics

JOHN HEILBORN: Emeritus professor of History at the University of California, in Berkeley
Tuesday 24th May 2005 (18h. Auditorium, Rectorship building)

PHYSICS AND ARTS

Series of dialogs and cultural activities

PHYSICS AND MUSIC: Electroacoustic concert by the *Orquestra del Caos*

Álvar Sánchez, Professor of the Department of Physics of the UAB
Josep M. Berenguer and Carlos Gómez, co-directors of the *Orquestra del Caos*
Thursday 28th October 2004 (18h. **Theatre room**, by the Civic square)

PHYSICS AND LITERATURE Cosmos, creativity and poetry: *Quark Poetry*

David Jou, Professor from the area of Condensed Material Physics of the UAB
Josep Perelló, Professor at the Department of Fundamental Physics of the UB
Thursday 25th November (18h. **Theatre Room** by the Civic square)

PHYSICS AND INSTRUMENTS: *Pendulum*

Xavier Roqué, Director of the Centre d'Estudis d'Historia de la Ciència (CEHIC) of the UAB
Marc Boada, Director
Thursday 13th January 2005 (18h. Theatre Room by the plaça Cívica)

PHYSICS AND ARTS

PHYSICS AND DANCING:

Aula de Dansa de la UAB, with the performance "Anna and the tears of fish",
Francesc Tintó, Engineer from the Centre National d'Études Spatiales (CNES)
Carles Salas, Choreographer
Thursday 3rd March 2005 (18h. Theatre Room by the plaça Cívica)

PHISICS AND PLASTIC ARTS

Marià Baig, Professor from the Department of Physics of the UAB
Pau D. Alsina, Co-director and publisher of *Artnodes, espai d'art, ciència i tecnologia* (UOC)
Thursday 14th April 2005 (18h. Cinema Room by the plaça Cívica)

(It includes a tour around the exhibitions of the Year of Physics)

PHYSICS AND CULTURE

Eduard Punset, journalist and professor at the Faculty of Economics of the IQS (URL)
Martí Domínguez, writer, biologist and professor of the UV
Thursday 12th May 2005 (18h. Cinema Room by the plaça Cívica)

PHYSICS AND SOCIETY

Series of films and debates.

- **Film:** THE DAY AFTER TOMORROW by *Roland Emmerich* (2004)
Thursday 2nd December 2004 (18h. Cinema Room by the plaça Cívica)
- **Debate:** IS CLIMATE CHANGE A QUESTION OF FAITH OR SCIENCE?
Joseph Enric Llebot, Professor in Condensed Material Physics of the UAB
Alba Cabañas, Director if the Department of Environment of National Work Promotion
Moderator: Lluís Reales (UAB)
Thursday 9th December 2004 (18h. Cinema Room by the plaça Cívica)
- **Film:** MATRIX by *Andy & Larry Wachowski* (1999)
Thursday 17th February 2005 (18h. Cinema Room by the plaça Cívica)
- **Debate:** ARTIFICIAL INTELLIGENT ON THE NET?
Manuel Delfino, Director of the Port d'Informació Científica (PIC)
Ramón López de Mantaras, Director of the Institut d'Investigació en Intel·ligència Artificial (IIIA, CSIC)
Moderator: Lluís Reales (UAB)
Thursday 24th February 2005 (18h. Cinema Room by the plaça Cívica)
- **Film:** 2001 A SPACE ODYSSEY by *Stanley Kubrick* (1968)
Tuesday 1st March 2005 (18h. Cinema Room by the plaça Cívica)

- **Special Conference:** *Spacial research in Europe*
JORDI ISERN, Director of the Institut de Ciències Espacials de Catalunya (IEEC)
 Thursday 10th March 2005 (18h. Auditorium, Rectorship building)
- **Film:** THE CHINA SYNDROME by *James Bridges* (1979)
 Thursday 31st March 2005 (18h. **Cinema Room** by the plaça Cívica)
- **Debate:** THE FUTURE OF ENERGY *Joaquim Corominas*, Professor of the Department of Geography of the UAB
Mariano Marzo, Professor of the Department of Stratigraphy, Paleontology and Marine Geosciences of the UB
 Moderator: Lluís Reales (UAB)
 Thursday 7th April 2005 (18h. Auditorium, Rectorship building)

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Activitats paral·leles

As well as the scheduled activities, throughout the year there will be different activities that also fit into the celebrations for the Year of Physics in the UAB. All the information on this page about the activities will be updated regularly.

Tuesday 26th October 2004

DAVID JOU

"The adventure of physics in the mirror of poetry",

Inauguration conference of the 2004-2005 academic year of the Faculty of Education Sciences (12h. Auditorium, Faculty of Education Sciences)

Wednesday 17th November 2004

FOUCAULT'S PENDULUM

Inauguration of the permanent exhibition Foucault's Pendulum (13.30h. Central hall, Faculty of Sciences)

CELLS AND PLANETS

Performance combining physics and bubbles

Pep Bou. Actor, creator and plastic artist **Jorge Wegensberg**. Physician, professor of the UB and director of CosmoCaixa Barcelona

Pep Bou and Jorge Wegensberg come together in a session that combines physics and the visual poetry of soap bubbles. Pep Bou, passionate about visual arts, has created an ephemeral world that harmoniously mixes air, water, light and music. The light nature of soap bubbles makes each performance different from the rest.

Free entry until the theatre is full.

Duration of the performance : 45 minutes.

Thursday 18th November 2004 at 14h.
Theatre Room of the UAB

PLANETS by Gustav Holst Conference by Francesc Cortès

It was called "music of the spheres": Greek philosophers were first to talk about this enigmatic music that flowed out of the planets. They thought the enormous spheres, while rolling and turning on their orbits, murmured an unmistakable sound to the empty space. Gustav Holst (1874-1934) was the first person to offer contemporary music this sleeping giants' concert.

Within the year of physics, and since the OBC is interpreting *The Planets* in the Auditori de Barcelona, we invite you to a conference by Francesc Cortès, director of the Department of Art of the UAB, where you will learn about the mysteries of this music. Holst poured all his passionate knowledge about the ancient Greek culture into this symphonic suite, which was first played in 1918. His visionary music plunges us into the paths of Mars, Venus, Mercury, Jupiter, Saturn, Uranus and Neptune. Pluto wasn't discovered until 1930 and therefore it wasn't included in this series. Even so, many cosmologists do not consider this celestial body a planet. The nature of this very famous melody can be found in the soundtracks of science-fiction films (some of them very recent such as *Mission to Mars* or *The Chronicles of Riddick*); and a great deal of musicians, such as James Horner, Hans Zimmer or Vangelis have sought inspiration from it or, some people may even say they directly plagiarized it. Welcome to a voyage through outer space.

Free entry until the theatre is full.

**Wednesday 1st December 2004 at 18h.
Theatre Room of the UAB (plaça Cívica)**

PHYSICS SHOW UAB, 18th-20th January 2005

During the 18th, 19th and 20th January, coinciding with the Open Days of the UAB, the Physics Show, organized for the Year of Physics that we are celebrating this 2004-2005 academic year, will take place. There you'll be able to admire robots, levitating trains, fire syringes, holograms, experiments with soap bubbles and demonstrations on optics, thermodynamics, waves and electricity. At this show there will also be the presentations of several appliances made of the latest materials!

The Physics Show counts with collaboration from Miguel Cabrerizo (Universidad de Granada), Adolf Cortel (IES Martorell, Martorell) and Anton Aubanell (UB, IES Sa Palomera, Blanes), all of whom have won several national and European prizes for teaching physics, as well as recognitions from other centres linked to the UAB (Optics Group, Electromagnetism Group, EUSS Enginyeria, ICMAB-CSIC, etc.)

- [Program of activities](#)
- [Participants](#)

**Opening hours: 11h to 15h
Place: Central hall, Faculty of Sciences**

Program of activities Tuesday 18th January

11h – 15h. Exhibitions and displays.

Participants:

- EUSS Enginyeria
- Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)
 - Group of Aerogels from the Laboratory of Cristallography and X-Ray Diffraction
 - Department of Magnetic Materials and Superconductors
- Optics Group of the Department of Physics of the UAB
- Superconductivity Group of the UAB

12h – 14h. Visits to a teaching laboratory of the Optics Group of the UAB.

Visiting Hours: 12h, 13h and 14h.

In order to take the tour you must first write yourselves down on the list at the stand of the Optics Group. Tours are limited to 15 people per group.

Wednesday 19th January

10:15h. Official inauguration of the Physics Show (Sala de Grau, Faculty of Sciences)

11h – 15h. Exhibitions and displays.

Participants:

- Miguel Cabrerizo
- Adolf Cortel
- EUSS Enginyeria
- Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)
 - Group of Aerogels from the Laboratory of Cristallography and X-Ray Diffraction
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13h briefing-exhibition by Miguel Cabrerizo (Universidad de Granada) in the Sala de Graus of the Faculty of Sciences

Thursday 19th January

11h – 15h. Exhibitions and displays.

Participants:

- Anton Aubanell
- Miguel Cabrerizo
- Adolf Cortel
- EUSS Enginyeria
- Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)
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SERIES SCIENCE ON THE STAGE

Reading of theatre plays based on science

28/02/05

COPENHAGUEN, by Michael Fryn

With Jordi Boixaderas, Lluís Soler & Rosa Cadafalch

Direction: Toni Casares

07/03/05

DIDEROT AND THE DARK EGG, by Hans Magnus Enzensberger

With Arnau Vidal & Toni Casares

Direction: Ricard Gazquez

14/03/05

PROOF, by David Aubourn

With Àngel Llàcer, Juan Carlos Martel, Marta Corral & Màrcia Cisteró

Direction: Màrcia Cisteró

04/04/05

GALILEO GALILEI, by Bertolt Brecht

With actors from the Aula de Teatre de la UAB

Direction: Arnau Vidal

11/04/05

FRAGMENTS OF A FAREWELL LETTER READ BY GEOLOGISTS, by Normand Chaurette

With Laura Conejero, Jordi Banacolocha, Oriol Broggi, Miquel Bonet & Toni Casares

Direction: Oriol Broggi

18/04/05

EL TEMPS DE PLANCK, by Sergi Belbel

With Sergi Belbel

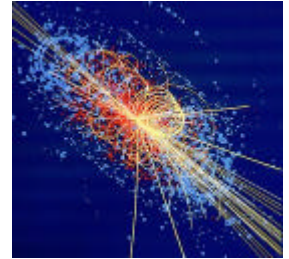
Auditorium, Faculty of Sciences
Monday at 16.30h.

Free entry until the theatre is full.
For more information visit: www.uab.es/culturaenviu.

EXHIBITION ON THE YEAR OF PHYSICS

Physics: the basis of reality, the tools for the future

Physics deals with the mathematical principles that govern phenomena, it explores their use and tries to unify them. Physics is where observation, experimentation and calculation meet, and also the nearly philosophical interest in the most basic concepts of reality and the basics of the technologies that will define the future. This exhibition intends to offer a precise view on physics and the direction it takes, which are its origins and its basis, as well as its uses and open problems. We wish to spread the research on physics that is currently being carried out on the campus and its international connections.



From 17th May to 17th June 2005
Exhibitions Room of the UAB
Communication Library and General Newspaper Library building, by the plaça Cívica

nANoPImATmoLEc Nanoparticles & molecular materials Exhibition by Víctor F. Puentes

This exhibition shows the shapes that appear when a drop of a solution containing 10¹⁶ nanometric particles per millimeter evaporates, (1 nanometer, nm, is a millionth part of a millimeter; an atom of Cobalt measures approximately 0.3nm, and one of gold measures 0.5nm) The same process is used for the observation of the dregs of coffee, where the solid part in a solution forms structures when it is deprived of the solution that holds it.



From 11th April to 27th May 2005
Hall of the Theatre Room of the UAB, by the plaça Cívica

MCDXL(IV+I) The voyage of edges Exhibition by Carles Pujol

"My installations suggest meditation on two basically conceptual areas. Space as the generator of a continent where the existence of the world of composition, entropy or tautology is important. Time as a warning of a variable behavior depending on the psychological state of the observer. I'm not interested in looking for beauty, nor emotions, nor contemplating just for the sake of it" CP.



From 4th April to 29th April 2005
Exhibitions Room of the UAB
Communication Library and General Newspaper Library building, by the plaça Cívica

DOCTOR HONORIS CAUSA OF ROBERTO TORRETI BY THE UAB

Honoris causa proposed by the Faculties of Philosophy and Languages and of Sciences

28th April 2005

UNIDANSA 2005

The Aula de Dansa de la UAB has organised the third edition of Unidansa between the 1st and 5th May. A meeting point for seven European universities to commemorate the art of dancing, the melody of human shapes. Unidansa 2005 is based around three basic concepts: a dancing exhibition, workshops and debates.

UNIDANSA05

III TROBADA EUROPEA
DE DANSA UNIVERSITÀRIA
UNIVERSITAT AUTÒNOMA
DE BARCELONA



To commemorate the Year of Physics, each university taking part will present a choreography lasting 15 minutes based on physics. There will be students representing the Basque Country, Budapest, Naples, Paris, London and the UAB who will offer this repertoire of energies, languages, imagination and moving bodies. If it is true that gesture language accounts for 70% of communication between humans, then dancing is a science that is just as exact as physics: with the knowledge on other bodies and other languages, there will be no need for translators, and this will help us to come to terms with ourselves better. So that you have access to the choreographies that are part of this adventure under the name "dancing and physics", they will be performed at the Theatre Room of the UAB, at the Estruch in Sabadell, and in the plaça Cívica, with a street adaptation.

The two scheduled debates will discuss the relationship between scenic arts and physics on one hand, and cinema and dancing on the other hand. Participants include choreographers such as Carles Salas, Toni Mira and Alain Marillat, the film director Núria Oliver-Bellés and the physicists David Jou, Àlvar Sánchez and Emilio Balzano.

The inauguration of the event will take place on Sunday 1st May 2005 at 21:30h at the Theatre Room of the UAB: /Anna and the tears of fish/ a choreography created by the Aula de Dansa de la UAB, that was first performed in May as part of the activities programmed for the Year of Physics.

You can look up all the program for Unidansa 2005 at www.uab.es/culturaenviu/unidansa.htm

Conference: *The origin of mass and the feebleness of gravity*

FRANK WILCZEK (Massachusetts Institute of Technology)
5th May 2005 (18h at the Auditorium of the Faculty of Sciences)

CLOSING OF THE YEAR OF PHYSICS

The Year of Physics ended on Thursday 26th May with a joint performance of the Choir, the Orchestra and the Combo of the UAB called *Nocturns*, based on poems written by Dr. David Jou, that were sang specially for this occasion by students from the Escola Superior de Música de Catalunya (ESMUC). The event will be hosted by the rector of the university, Lluís Ferrer,

At 15:30h that same day, in the Exhibitions Room of the UAB, the exhibitions of the Year of Physics were presented.

Thursday 26th May 2005
13:30h at the Theatre Room by the plaça Cívica

