

PASSION FOR KNOWLEDGE



27 SEPTEMBER - 1 OCTOBER 2016

SAN SEBASTIAN
BILBAO
BORDEAUX



**PRESS
DOSSIER**

<http://p4k.dipc.org>

 #passionDIPC



PASSION FOR KNOWLEDGE



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PASSION FOR SCIENCE, PASSION FOR CULTURE



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PASSION FOR KNOWLEDGE

Welcome to **Passion for Knowledge (P4K)**, a festival to promote science as a cultural key activity that also contributes to social and economic progress and development, as well as to social freedom. By gathering scientists, leading figures from different disciplines and citizens at large, the festival aims at bringing scientific knowledge to society and fostering the participation of the public in the dissemination of science and its values.

This year's event is the third of **P4K** series of festivals and the fifth large-scale science communication and outreach event hosted by Donostia International Physics Center (DIPC). The activities of **Passion for Knowledge 2016** will mainly take place in the city of San Sebastian (Basque Country) from September 27th to October 1st 2016, jointly with the **European Capital of Culture** held by the city this year 2016. Indeed, it forms an integral part of the official DSS2016EU Capital of Culture programme, under the section Conversations.

The event will serve to assert, once again, that science is an essential part of human culture, it is probably the most important collective cultural piece of work of humankind.

Passion for Knowledge is, Passion for Culture.

The main venue will be the hundred-year-old **Victoria Eugenia Theatre of San Sebastian**, specially chosen to highlight the cultural nature of science. However, **P4K 2016** aspires to transcend beyond its main venue and to spread across even crossing borders. Several parallel activities have been also scheduled in Bilbao, as well as in Bordeaux (France), the latter organised within the framework of Euskampus, the International Campus of Excellence of the University of the Basque Country (UPV/EHU).

Festival Programme

Passion for Knowledge 2016 includes a wide range of activities designed to engage all citizens, both adults and young. The programme is built around a series of Plenary Lectures aimed at the general public, given by distinguished figures, including several Nobel Laureates, and world-class experts from different disciplines. However, the festival offers much more: Encounters between high school students and leading scientists, a Scientific School for young researchers, Naukas sessions, exhibitions and live performances, to name but a few.

	Monday 26 SEP	Tuesday 27 SEP	Wednesday 28 SEP	Thursday 29 SEP	Friday 30 SEP	Saturday 1 OCT
MORNING			ENCOUNTERS Bilbao		ENCOUNTERS San Sebastian	ZIENTZIA KLUBA San Sebastian
AFTERNOON		OPENING San Sebastian	PLENARY LECTURE San Sebastian			SPECIAL NAUKAS PASSION San Sebastian
		PLENARY LECTURE San Sebastian			BERTSOLARIAK SESSION San Sebastian	PLENARY LECTURE San Sebastian
		PLENARY LECTURE San Sebastian				
		PLENARY LECTURE San Sebastian	NAUKAS PASSION San Sebastian	ROUND TABLE San Sebastian	NAUKAS PASSION San Sebastian	CLOSING San Sebastian
ALL DAY	SCIENTIFIC SCHOOL San Sebastian					
	PHOTOGRAPHIC EXHIBITION San Sebastian		EXHIBITION OPENING San Sebastian		PHOTOGRAPHY EXHIBITION San Sebastian	
OTHER CITIES			PLENARY LECTURE Bilbao	PLENARY LECTURE Bordeaux		

The **Public Lectures** of **Passion for Knowledge** will once again be the core of this festival of science, knowledge, culture and passion.

This public programme features: **Plenary Lectures** by leading, world-class researchers, including several Nobel Laureates; a **Round Table** focusing on creativity, an innovative staging to show the creative process of **Basque improvised versifiers**, so called Bertsolaris, or the popular **Naukas** sessions. Moreover, at the opening of the festival, **P4K** will present **Breaking Boundaries**, a performance involving sculptures, dancers, sound, and projections in an attempt to break down the boundaries between science and art.

The hundred-year-old **Victoria Eugenia Theatre of San Sebastian** will be the venue for these sessions that combine scientific rigour with entertainment, to awake curiosity, interest, enthusiasm and critical thinking of society.

Simultaneous interpretation service into English, Basque and Spanish will be available, and all sessions will be **streamed live** over the festival's website.

Entrance to public sessions is **free** until seating capacity is complete, although **previous registration** is recommended.

Plenary Lecturers:



**Dame Jocelyn
BELL BURNELL**

Oxford University,
UK



**Andrew
BLAKE**

The Alan Turing Institute,
UK



**Alessandra
BUONANNO**

Max Planck Institute for
Gravitational Physics,
Germany



**François
ENGLERT**

Université Libre de
Bruxelles, Belgium

Nobel Laureate in Physics 2013



**William
FRIEDMAN**

Harvard University,
USA



**Dudley
HERSCHBACH**

Harvard University,
USA

Nobel Laureate in Chemistry 1986



**Martin
KARPLUS**

Harvard University, USA;
Université de Strasburg, France

Nobel Laureate in Chemistry 2013

Public Lectures Plenary Lectures

Several Nobel laureates and prestigious international researchers from different scientific disciplines will share with the audience their passion and knowledge about a wide range of subjects, such as astrophysics, software engineering, quantum physics, neuroscience, botany or biomedicine. Tales of exploration, scientific challenges and a generous dose of passion for knowledge in the flagship of the festival.

Most of the plenary lectures will be held in San Sebastian, in the main venue, but lectures have also been scheduled in other nearby cities, like Bilbao, and we will also cross the border into our neighbouring country to take **Passion for Knowledge** to Bordeaux.



Elena
CATTANEO

Università degli Studi di
Milano, Italy



Claude
COHEN-TANNOUDJI

École Normale Supérieure,
France

Nobel Laureate in Physics 1997



Klaus von
KLITZING

Max Planck Institute for
Solid State Research,
Germany

Nobel Laureate in Physics 1985



Sir John
PENDRY

Imperial College London,
UK



Agustín
SANCHEZ-LAVEGA

University of the Basque
Country (UPV/EHU),
Basque Country



Rafael
YUSTE

Columbia University,
USA

PASSION FOR KNOWLEDGE

Aimed at:

General public.

Capacity:

600 people.

Language:

English and Spanish
(Simultaneous interpretation
into Basque, Spanish and
English).

Dates:

27 SEP - 1 OCT

Time:

17:30 - 19:30

Venues:

San Sebastian
> Victoria Eugenia Theatre
Bilbao
> Bizkaia Aretoa, UPV/EHU
Bordeaux, France
> Université de Bordeaux

Registration:

Registration is free.

<http://p4k.dipc.org>

Public Lectures Round Table: Creativity

PASSION FOR
KNOWLEDGE

The programme of public lectures also includes a Round Table focused on creativity.

Moderated by **Pedro Miguel ECHENIQUE**, Chairman of **P4K**, the round table will feature four renowned specialists from different fields of Humanities, who from their own expertise and knowledge will talk about something so intangible yet valuable such as creativity.

What is creativity?
What mental mechanisms are responsible for the creative process?
Is a scientist's creativity the same as a writer's?

Different outlooks, but a common connection

Aimed at:

General public.

Capacity:

600 people.

Language:

Spanish and Basque
(Simultaneous interpretation into Basque, Spanish and English).

Date:

Thursday, 29 SEP

Time:

19:30 - 20:30

Venue:

San Sebastian
> Victoria Eugenia Theatre

Registration:

Registration is free.

<http://p4k.dipc.org>

Participants:



**Itziar
LAKA**

University of the Basque
Country (UPV/EHU),
Basque Country



**Juan Ignacio
PÉREZ**

University of the Basque
Country (UPV/EHU),
Basque Country



**Kirmen
URIBE**

Writer
Basque Country



**Rafael
YUSTE**

Columbia University,
USA

Knowledge is not the exclusive domain of either art or science, that is why in **Passion for Knowledge** we will not only be talking about physics, chemistry, engineering and botany. Every field of knowledge has a role to play, including one that exclusively belongs to the Basque culture: the art of Basque improvised sung poetry.

In a very special session, three of the Basque Country's most talented and best-known versifiers, known locally as "bertsolaris", will come together to demonstrate and explain to the general public the creative process involved in improvising a sung poem, a so called "bertso".

Once given a topic, during those few seconds of absolute concentration in which they have to put all the pieces of the puzzle together, taking rhyme and melody into account as well, what actually goes on inside a bertsolari's head?

Aimed at:

General public.

Capacity:

600 people.

Language:

Basque (Simultaneous interpretation into Spanish and English).

Date:

Friday, 30 SEP

Time:

18:10 - 18:50

Venue:

San Sebastian
> Victoria Eugenia Theatre

Registration:

Registration is free.

<http://p4k.dipc.org>

Bertsolariak:



Amets
ARZALLUS



Andoni
EGAÑA



Maialen
LUJANBIO

Public talks also include a Naukas session, organised in collaboration with the online popular science communication platform Naukas, science, scepticism and humour, and coordinated by the Chair in **Scientific Culture of the University of the Basque Country (UPV/EHU)**.

On a couple of days, just after the plenary talks, some of Naukas' best collaborators will take the stage of Victoria Eugenia Theatre to offer the public their own somewhat special view on different scientific subjects. The format follows that of successful previous science communication events organised by the platform: disseminating science in **ten-minute short talks** in lay words, and in a dynamic, amusing and original way. Moreover, the cherry on the cake of the **Naukas Passion** section comes on the closing day of the festival, when there will be a special Naukas session.

Aimed at:

General public.

Capacity:

600 people.

Language:

Spanish (Simultaneous interpretation into Basque, Spanish and English).

Dates:

28 SEP, 30 SEP and 1 OCT

Time:

19:30 - 20:30

17:30 - 18:30

Venue:

San Sebastian
> Victoria Eugenia Theatre

Registration:

Registration is free.

<http://p4k.dipc.org>

Speakers:



**Xurxo
MARIÑO**

**Universidade da Coruña,
Spain**
Special Naukas Passion

José Ramón ALONSO

Universidad de Salamanca,
Spain

Almudena MARTÍN CASTRO

Innaxis Research Institute and
Foundation, Madrid, Spain

Pablo RODRIGUEZ

Wageningen University,
the Netherlands

Beatriz SEVILLA MONTERO

Universidad Autónoma de
Madrid, Spain

Dolores BUENO

Institut de Ciència de
Materials de Barcelona
(ICMAB-CSIC), Spain

Helena MATUTE

Universidad de Deusto,
Bilbao, Basque Country

**Natalia RUIZ
ZELMANOVITCH**

Instituto de Ciencia de
Materiales de Madrid (CSIC),
Spain

César TOMÉ

Euskampus Fundazioa,
Basque Country

Clara GRIMA

Universidad de Sevilla, Spain

José Antonio PÉREZ LEDO

TV script writer and director

Aitor SÁNCHEZ GARCÍA

Universidad de Granada,
Spain

Daniel TORREGROSA LÓPEZ

Asociación de Divulgación
Científica de la Región de
Murcia, Spain

Convergence, Collaboration and Integration

Breaking Boundaries is a spectacle involving sculptures, dancers, sound and projections, exploring themes of crossing cultural, scientific, artistic and interpersonal boundaries. The work is being created by the UK based artists **Melissa Pierce Murray** and **Diana Scarborough**, in collaboration with DIPC, ad hoc for the opening of **Passion for Knowledge 2016**.

The project has also the collaboration of **Dantzagunea**, and through this institution of the resident dance company **Dantzaz**, to which the professional dancers featured in the spectacle belong.

Aimed at:

General public.

Capacity:

600 people.

Date:

Tuesday, 27 SEP

Time:

~18:00 - 18:15

Venue:

San Sebastian
> Victoria Eugenia Theatre

Registration:

Registration is free.

<http://p4k.dipc.org>



Zientzia Kluba

On Saturday, October 1st, in the morning, at the **Club Room of the Victoria Eugenia Theatre**, a Science Club, namely, Zientzia Kluba, will take place. It is a session specially aimed at the youngest public, and mainly carry out in Basque. This mini science event for young people, kids, and not so kids, will feature funny scientific activities: live experiments, science storytellers, monologues, etc.

Entrance to Zientzia Kluba **is free of charge**, like to the other festival's public sessions. However, due to the limited capacity of the room and since Zientzia Kluba is addressed to a particular audience, a specific registration form will be available soon on the festival website.

PASSION FOR KNOWLEDGE

Aimed at:

Young and kids.

Capacity:

100 people.

Language:

Mainly in Basque.

Date:

Saturday, 1 OCT

Time:

In the morning.

Venue:

San Sebastian
> Victoria Eugenia Theatre

Registration:

Free registration later on available on the website.

<http://p4k.dipc.org>

On Zientzia

On Zientzia is a project devoted to promote the production and dissemination of short, original videos on science and technology subjects involving the participation of the citizens. It is organised jointly by DIPC and Elhuyar.

The video repository of On Zientzia is available on the Internet and during **Passion for Knowledge 2016**, some of the best videos will be screened in different cultural and leisure centres.

The aim is to get science out to citizens by using media in unconventional spots, such as cinema clubs, urban screens and cultural centres, among others.



www.onzientzia.tv

La couleur des années cinquante

Passion for Knowledge 2016 presents **"The colour of the Fifties"** by **Martin KARPLUS**. This exhibition first shown at the Biblioteque Nationale de France, is comprised of about a hundred images from among the thousands of photographs taken by Nobel Laureate Prof. Martin Karplus, during the period 1953-1965. The original Kodachrome Leica slides, many of which are now over 50 years old, were scanned by a master craftsman, and the exhibition prints were made from these images.

The photographs show the inquiring mind and profoundly humanist vision of a young man who would become a world-famous scientist.

The exhibition will be held at the **San Sebastian Aquarium from September 26th to November 20th**. The photographs will be on display in the T Room of the Aquarium, access to which is included in the general entrance ticket. In addition, free guided tours will be organised during the **P4K** week.

Aimed at:

Everybody.

Dates:

26 SEP - 20 NOV

Venue:

San Sebastian
> Aquarium

Registration:

Sign-up for free guided tours will be later on available on the website.

<http://p4k.dipc.org>



© Self-portrait, Martin Karplus

Given their success in previous years, **Passion for Knowledge 2016** would not be complete without a new edition of **top@DIPC - Zientziarekin solasean!, the Encounters between Nobel Laureates and world-leading researchers and secondary school students** that DIPC has been organising every year since 2009.

The main aim of these encounters is to foster students' interest in science and technology and to kindle a passion for knowledge in their young minds.

The VIII edition will schedule two encounters: one in San Sebastian and another in Bilbao. In a relaxed, friendly atmosphere students will have the chance to chat with top-level scientists, including various Nobel laureates, and to ask them questions directly.

Each encounter will feature three internationally renowned researchers from different fields, selected from among the **P4K** guest speakers, along with **Pedro Miguel ECHENIQUE** who will act as moderator of the Encounters.

Aimed at:

Secondary education community.

Capacity:

250 - 300 people per encounter.

Language:

English (Simultaneous interpretation into Basque, Spanish and English).

Dates:

28 SEP (Bilbao)

30 SEP (San Sebastian)

Time:

10:00 - 13:30

Venues:

San Sebastian

> Eureka! Zientzia Museoa

Bilbao

> Bizkaia Aretoa, UPV/EHU

Registration:

Free registration through participating schools. The pre-registration form is already available on the website.

<http://p4k.dipc.org>

Bilbao speakers:



**Dame Jocelyn
BELL BURNELL**
Oxford University,
UK



**Claude
COHEN-TANNOUJJI**
École Normale Supérieure,
France
Nobel Laureate in Physics 1997



**Martin
KARPLUS**
Harvard University, USA;
Université de Strasbourg, France
Nobel Laureate in Chemistry 2013

San Sebastian speakers:



**Elena
CATTANEO**
Università degli Studi di
Milano, Italy



**Pamela
DIGGLE**
University of Connecticut,
USA



**Dudley
HERSCHBACH**
Harvard University, USA
Nobel Laureate in Chemistry 1986

Dynapeutics

The **Passion for Knowledge 2016** programme of activities also includes an international summer school **focused on a topic of interest for the local scientific community**, and specially addressed to PhD students and young postdoctoral researchers.

Dynapeutics, as the school is called, aims to introduce, describe and discuss the theory and applications of different computational methods for studying and simulating biomolecules in biological environments, relevant for the design and optimisation of molecular drugs, as well as for our understanding of biological processes in general at a molecular level.

The school consists of two different sessions: in the morning, theoretical lessons held at the **Materials Physics Center** (CFM, a joint CSIC-UPV/EHU centre) and, early in the afternoon practical lessons with computers in the **Ignacio Maria Barriola** building at the University of the Basque Country (UPV/EHU).

The school is chaired by Xabier LÓPEZ lecturer at the UPV/EHU and, it will also have the participation of the Nobel Laureate Martin KARPLUS, one of the plenary speakers of P4K 2016.

For more information, visit:
<http://dynapeutics.dipc.org>

Aimed at:

International research community.

Capacity:

50-60 people.

Language:

English.

Dates:

25 - 30 SEP

Time:

09:00 - 18:00

Venues:

San Sebastian
> CFM, Materials Physics Center, CSIC-UPV/EHU
> UPV/EHU, Ignacio María Barriola

Registration:

Call open at the school's website.





Dame Jocelyn BELL BURNELL
Astrophysics star forgotten in the Nobel firmament

Oxford University, UK

A British astrophysicist, she graduated from the University of Glasgow with a BSc degree in Natural Philosophy (Physics) in 1965, and obtained her PhD from University of Cambridge in 1969. As a postgraduate student at Cambridge, she discovered the first radio pulsars with her thesis supervisor Antony Hewish, for which Hewish shared the Nobel Prize in Physics. After finishing her PhD, Bell Burnell worked at many wavelengths and in many roles in universities and institutions in Britain while raising a family, and was also a visiting professor at Princeton University in the United States. She is currently a Visiting Professor of Astrophysics at the University of Oxford, a Fellow of Mansfield College Oxford, a pro-Chancellor at Trinity College Dublin and President of the Royal Society of Edinburgh, Scotland's National Academy. She has also served as President of the Royal Astronomical Society from 2002-2004, and as President of the Institute of Physics (2008-2011).

Although Bell was not included as a co-recipient of the Nobel Prize, which stoked some controversy at the time, she has been honoured by many organizations. Among other awards, she received the Albert A. Michelson Medal of the Franklin Institute of Philadelphia in 1973, the Magellanic Premium of the American Philosophical Society in 2000 and a Royal Medal from the Royal Society in 2015. She has been awarded numerous honorary degrees too, and is a Fellow of the Royal Society, and five other Academies. She was appointed a Dame by the British Queen in 2007. Jocelyn Bell's excellence contribution in science communication has been also awarded with the 2010 Michael Faraday Prize by the Royal Society.



Andrew BLAKE **And the machines saw us dance**

The Alan Turing Institute, UK

Andrew Blake took up his current post as Institute Director of The Alan Turing Institute in October 2015. He was previously a Microsoft Distinguished Scientist and the Laboratory Director of Microsoft Research Cambridge, UK. Prior to joining Microsoft, Andrew trained in mathematics and electrical engineering in Cambridge, UK, and studied for a doctorate in artificial intelligence at the University of Edinburgh. He was an academic for 18 years, in Edinburgh and latterly on the faculty in Engineering at Oxford University, where he was a pioneer in the development of the theory and algorithms that can make it possible for computers to behave as seeing machines. He has published several books including *“Visual Reconstruction”* with A. Zisserman (MIT press), *“Active Vision”* with A. Yuille (MIT Press), and *“Active Contours”* with M. Isard (Springer-Verlag).

He won the prize of the European Conference on Computer Vision twice, with R. Cipolla in 1992 and with M. Isard in 1996, and was awarded the IEEE David Marr Prize (jointly with K. Toyama) in 2001. In 2006 the Royal Academy of Engineering awarded him its Silver Medal and in 2007 the Institution of Engineering and Technology presented him with the Mountbatten Gold Medal (previously awarded to computer pioneers Maurice Wilkes and Tim Berners-Lee, amongst others). In 2011, he and colleagues at Microsoft Research received the Royal Academy of Engineering MacRobert Gold Medal for the machine learning recognition capability of the Microsoft Kinect 3D human motion-capture system. He was elected Fellow of the Royal Academy of Engineering in 1998, Fellow of the IEEE in 2008, and Fellow of the Royal Society in 2005. In 2010, Andrew was elected to the Council of the Royal Society and in 2012 was appointed to the Council of the EPSRC. He has received honorary Doctorates from the University of Edinburgh and the University of Sheffield.



Alessandra BUONANNO **The physics of gravitational waves**

Max Planck Institute for Gravitational Physics, Germany

Alessandra Buonanno earned her PhD in theoretical physics at the University of Pisa in Italy. After a brief period spent at the theory division of CERN, she became a postdoctoral scholar at the Institut des Hautes Etudes Scientifiques (IHES) in France and then was awarded the Tolman Prize Fellowship at the California Institute of Technology in the USA. She was a permanent researcher at the Institut d’Astrophysique de Paris (IAP) and Laboratoire Astroparticule et Cosmologie (APC) in Paris working for the Centre Nationale de la Recherche Scientifique (CNRS) before joining the University of Maryland as physics professor. While at the University of Maryland, Buonanno has been a Fellow of the Alfred P. Sloan Foundation. She was a William and Flora Hewlett Fellow at the Radcliffe Institute for Advanced Study at Harvard University.

She is a Fellow of the International Society on General Relativity and Gravitation, and a Fellow of the American Physical Society. Since the Fall 2014 she is a director at the Max Planck Institute for Gravitational Physics (or Albert Einstein Institute) in Potsdam and a College Park Professor at the University of Maryland. She is a Distinguished Visiting Research Chair at the Perimeter Institute. Her work spans several topics in gravitational physics, in particular theoretical and phenomenological aspects of gravitational-wave physics and astrophysics.



Elena CATTANEO
The healing power of stem cells

Università degli Studi di Milano, Italy

Professor Elena Cattaneo is Director of the Laboratory of Stem Cell Biology and Pharmacology of Neurodegenerative Diseases at the Department of Biosciences, as well as a co-founder and first appointed Director of UniStem, the Centre for Stem Cell Research of the University of Milano. The main research theme of her lab is the molecular pathophysiology of Huntington's Disease (HD). The lab's ultimate goal is to identify cells, molecules and pathways that are suitable for therapeutic intervention and new reagents for drug screening in Huntington's Disease. The lab is composed of 20 scientists and includes an internal management.

Prof Cattaneo's studies on neural stem cells and Huntington's disease saw her awarded the "Le Scienze" Price for Medicine and a Gold Medal from the President of the Italian Republic in 2001. In 2005 she was awarded the Marisa Bellisario and Chiara D'Onofrio prizes, in 2006 was nominated Cavaliere Ufficiale (Knight) of the Italian Republic, and in 2013 was appointed senator for life by Italy's president, Giorgio Napolitano. She was also named *Stem Cell Person of the Year* in 2013 by Paul Knoepfler and the readers of his blog, and awarded the ISSCR Public Service Award in 2014, with Paolo Bianco and Michele De Luca, for "their recent involvement in public debate and policy-making in Italy, championing rigorous scientific and medical standards and stringent regulatory oversight in the introduction of new stem cell treatments into the clinic."

Prof Cattaneo has published >160 papers in peer-reviewed journals, has given more than 400 invited lectures, and is very active in organizing professional development and outreach events - for both the scientific community and lay public.



Claude COHEN-TANNOUDJI
The atom hunter

École Normale Supérieure, France
Nobel Laureate in Physics 1997

French physicist born in Constantine (Algeria), he graduated in Physics and received his PhD from the École Normale Supérieure (ENS) in Paris in 1962. In 1960, he joined the Centre National de la Recherche Scientifique (CNRS), a connection he maintained until 1964 when he was appointed Professor at the University of Paris. In 1973, he was appointed as Professor of atomic and molecular physics at the Collège de France in Paris, a position that he held for many years. His teaching experience led him to publish several textbooks, which are well appreciated by undergraduate and graduate physics students. He pioneered the research into the various mechanisms that can be used to slow down, cool and trap atoms with a laser beam.

Cohen-Tannoudji and his team were among the first to cool atoms to very low temperatures, lower than one millionth of a degree above absolute zero. The techniques designed by Cohen-Tannoudji and other scientists have resulted in various specific applications, such as more accurate atomic clocks and more precise atomic interferometers and gyrometers to measure the force of gravity and rotation speed. These techniques have been also essential for producing new states of matter like Bose Einstein condensates. He received, with Steven Chu and William Phillips, the 1997 Nobel Prize in Physics for the development of methods to cool and trap atoms with laser light.



François ENGLERT
The mass boson caught red-handed

Université Libre de Bruxelles, Belgium

Nobel Laureate in Physics 2013

François Englert was born in Belgium in 1932. His parents came from a family of Polish Jews who emigrated to Belgium, where they survived the war thanks to the selfless help of many people. François Englert first got a Degree in electrical-mechanical engineering, and after he got a Physics Masters Degree in 1958 and a PhD in 1959. Then he moved to Cornell University (Ithaca, USA) as research associate for a young Professor Robert Brout. It was the beginning of a lifelong friendship, and a very fruitful scientific collaboration, that eventually brought them both to share the direction of the theoretical physics group at the University Libre de Bruxelles and to the discovery in 1964 of the mass generating mechanism, namely the Brout-Englert-Higgs (BEH) mechanism. Robert Brout passed away in 2011. François Englert, jointly with Peter Higgs, received the Nobel Laureate in Physics 2013 for this discovery. The Belgian physicist won the Prince of Asturias Award in 2013 too, together with Peter Higgs and the CERN laboratory.

According to modern physics, matter consists of a set of particles that act as building blocks. Between these particles lie forces that are mediated by another set of particles. A fundamental property of the majority of particles is that they have a mass. It was in 1964, when Robert Brout and François Englert published an article about the origin of particle's mass based in the broken symmetry, and predicted theoretically the existence of a fundamental particle to explain it. Independently, Peter Higgs published an article in the same subject six weeks later. In 2012, two experiments, ATLAS and CMS, conducted at the Large Hadrons Collider of the CERN laboratory, confirmed the existence of such particle, the so-called, Brout-Englert-Higgs boson particle. Prof. Englert has received many other awards and distinctions, including among them the Wolf Prize in Physics in 2004 (with Robert Brout and Peter Higgs). He holds several honorary doctorates from prestigious universities and he is honorary member of the European Physical Society and the Solvay Institute, as well as honorary President of the "Jeunesses Scientifiques of Belgium". He was ennobled with the title Baron by the King of Belgium.



William FRIEDMAN
The flower detective

Harvard University, USA

William (Ned) Friedman is the Arnold Professor of Organismic and Evolutionary Biology at Harvard University and the eighth Director of the Arnold Arboretum of Harvard University in its 144-year history. He is internationally recognized for his research on the evolutionary history of seed plants. Professor Friedman's studies have fundamentally altered century-old views of the earliest phases of the evolution of flowering plants, Darwin's "abominable mystery." Early in his career, he was selected by the U.S. National Science Foundation as a Presidential Young Investigator. He is a Fellow of the Linnean Society of London and American Association for the Advancement of Science. He currently teaches a freshman seminar at Harvard called "Getting to Know Darwin," in which the students re-create ten of Charles Darwin's experiments and read correspondence associated with each topic (yes, the students do visit a pigeon fancier and discover whether earthworms respond to piano and bassoon playing).

As Director of the Arnold Arboretum, Professor Friedman has worked to expand the Arboretum's societal impact through new and diverse public programming, enhanced communication between scientists and the public, and a reinvigoration of the long-standing relationship between the Arboretum and the biodiversity of Asia. In 2016, after four years of extensive planning, a ten-year initiative was launched to shape and augment the living collections of the Arnold Arboretum for the next century. Plant exploration around the globe will bring new collections of diverse species of woody plants to this remarkable botanical garden in Boston, and ensure that the next generation of plant and environmental scientists trained at Harvard are ready to tackle the challenges of everything from climate change to genomics.



Dudley HERSCHBACH

The Nobel Laureate who starred in The Simpsons

Harvard University, USA

Nobel Laureate in Chemistry 1986

Dudley Herschbach was born in San Jose (California) in 1932. He received his B.S. degree in Mathematics (1954) and M.S. in Chemistry (1955) at Stanford University, followed by an A.M. degree in Physics (1956) and Ph.D. in Chemical Physics (1958) at Harvard, then joined the chemistry faculty of the University of California at Berkeley in 1959. He returned to Harvard in 1963 as Professor of Chemistry where he became Baird Professor of Science (1976-2003). Now an Emeritus Professor at Harvard, in 2005 he joined Texas A&M University as an itinerant professor of physics. Professor Herschbach is a member of many academies and institutions and has received numerous international honors and awards. Along with his collaborator Yuan T. Lee and the Canadian chemist John C. Polanyi, he received in 1986 the Nobel Prize in Chemistry, for their contributions concerning the dynamics of elementary chemical processes.

Herschbach is a passionate advocate of science education and science for the general public. He frequently lectures students of all ages, imbuing them with his infectious enthusiasm for science and discovery. He long served as Chair of the Board of Trustees of the Society for Science and the Public, which publishes Science News and conducts the Intel Science Talent Search and the Intel International Science and Engineering Fair. He also lent his voice to an episode of The Simpsons (Treehouse of Horror XIV, episode 2007), where he presents the Nobel Prize in Physics to Professor Frink.



Martin KARPLUS

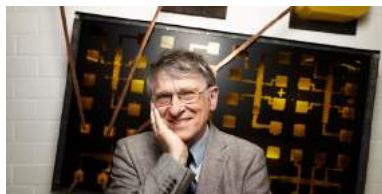
A theoretical chemist's return to biology

Harvard University, USA; Université de Strasburg, France

Nobel Laureate in Chemistry 2013

Martin Karplus was born in Vienna, Austria, in 1930. He received his BA from Harvard College in 1950 and his PhD from Caltech in 1953. He worked at Oxford University as an NSF postdoctoral fellow from 1953 until 1955, when he joined the faculty of the University of Illinois. In 1960 Karplus became professor at Columbia University, and in 1966 at Harvard University, where he was named Theodore William Richards Professor of Chemistry in 1979. He is also Professeur Conventionné at the Université Louis Pasteur. He is a member of the National Academy of Sciences (USA), the American Academy of Arts & Sciences, and a foreign member of the Netherlands Academy of Arts & Sciences and the Royal Society of London. He is a Commander in the French Legion of Honor. He has been received honorary degrees from several universities, as well as numerous awards for his many contributions to science, including the 2013 Nobel Prize in Chemistry.

Early in his career Karplus studied magnetic resonance spectroscopy; of particular interest was his theoretical analysis of nuclear spin-spin coupling constants. He made fundamental contributions to the theory of reactive collisions between small molecules based upon trajectory calculations. He was one of the first researchers to apply many-body perturbation theory to atomic and molecular systems. Over the years, Dr. Karplus has conducted research in many areas of theoretical chemistry and biochemistry and has presented his results in over 700 journal articles and book chapters, as well as two books. His primary interest has been to develop and employ theoretical methods for increasing our understanding of chemical and biological problems. His contributions have been instrumental in the transformation of theory from a specialized field to a central part of modern chemistry and more recently of structural biology.



Klaus von KLITZING **The nano-precision calibrator**

Max Planck Institute for Solid State Research, Germany
Nobel Laureate in Physics 1985

Born in 1943 in Schroda (German-occupied Poland, now Poland), Klaus von Klitzing studied Physics at the Technical University of Braunschweig. He continued his scientific career at the University of Würzburg, receiving his doctorate in 1972 and his habilitation in 1978. Subsequently, he was appointed professor at the Technical University of Munich (1980-1984), before becoming both Honorarprofessor (part-time prof.) at the University of Stuttgart and Director and Scientific Member at the Max Planck Institute for Solid State Research in 1985. Presently, Prof. Dr. Klaus von Klitzing is heading the department "Low Dimensional Electron Systems" at the Max Planck Institute for Solid State Research in Stuttgart, Germany.

During his scientific career, Klaus von Klitzing had research stays at the University of Oxford, England, at the High Magnetic Field Laboratory in Grenoble, France, and at the IBM Research Lab in Yorktown Heights, USA. In 1985, the Nobel Prize in Physics 1985 was awarded to Klaus von Klitzing "for the discovery of the quantized Hall effect". His discovery is used worldwide for high precision measurements and opened the way for new applications and microscopic understandings of nanoelectronic devices.



Sir John PENDRY **The invisibility cloak man**

Imperial College London, UK

Sir John Pendry was born in England in July 1943. He has been working at the Blackett Laboratory, Imperial College London (UK) since 1981. He began his career in the Cavendish Laboratory at the University of Cambridge, followed by six years at the Daresbury Laboratory of the Science and Technology Facilities Council (UK), where he headed the theory group. In collaboration with the Marconi Company, he designed a series of completely novel artificial materials, or "metamaterials", with properties not found in nature. Successively metamaterials with negative electrical permittivity, then with negative magnetic permeability were designed and constructed. This project culminated in the proposal for a 'perfect lens' whose resolution is unlimited by wavelength. He is popularly known for his research into negative refractive indexes and, jointly with David Smith of Duke University, for the creation of the first practical "Invisibility Cloak".

John Pendry was head of the physics department at Imperial College London and Principal of the Faculty of Physical Sciences. The long list of awards he has received includes, among others, his Fellowship of the Royal Society (1984), honorary fellow of Downing College at Cambridge University, and of the IEEE (International Electrical and Electronic Engineers), the Dirac prize (1996), the Royal Medal of the Royal Society (2006), as well as being knighted for his services to science (2004). More recently, he has been elected a Foreign Associate of the American National Academy of Sciences. In 2013 he received the Newton Medal from the Institute of Physics, and in 2014 he was awarded with the Kavli Prize for nanotechnology.



Agustín SANCHEZ-LAVEGA Explorer of other worlds

University of the Basque Country (UPV/EHU), Basque Country

Agustín Sánchez Lavega was born in Bilbao in 1954. From 1980 to 1987 he worked at the German-Spanish Astronomical Center–Max Planck Institut für Astronomie (Calar Alto Observatory) in Almería. In 1986 he earned a PhD in Physics from the University of the Basque Country (UPV/EHU), winning the extraordinary doctorate prize for his thesis. In 1987 he started work at the Bilbao Higher Technical School of Engineering, which forms part of UPV/EHU, where he is currently a Professor of Applied Physics and Director of the Applied Physics I Department. He has been a member of the advisory committee for the ESA Exploration of the Solar System and is currently an advisor to the E-ELT’s Scientific Programme (European Extremely Large Telescope, European Southern Observatory) and the National Astronomy Commission.

His research is focused mainly on the study of planetary atmospheres, and he is the director of the Planetary Science Group at UPV/EHU. He is a co-researcher on the European Space Agency’s space missions Venus Express, ExoMars18 and JUICE (Jupiter Icy Moon Explorer), as well as on NASA’s Mars 2020 mission. He has published more than 200 papers in specialized research journals, including 10 in the prestigious journals *Nature* (where he has featured on the cover 4 times) and *Science*. He has lectured all over Spain and given classes, seminars and courses at numerous universities and cultural centres. He has also written many science dissemination articles, as well as several chapters for books and encyclopaedias. He is the author of the textbook *“An Introduction to Planetary Atmospheres”* (published by Taylor & Francis - CRC, USA) and is the director of the AulaEspaZio Gela and head of the Master’s Degree Course in Science, Technology and Space Observation. He has directed and co-directed 13 doctoral theses, with another 4 currently underway. In 2010 he won an award for the best paper published in the Spanish Physics Journal and in 2014 won the University Level Physics Teaching and Dissemination award conferred by the Royal Spanish Physics Society – BBVA Foundation.



Rafael YUSTE Obama’s scientific brain

Columbia University, USA

Inspirer of the Brain Activity Map Project, a large-scale research project to record and manipulate the activity of every neuron in brain circuits, a project sponsored by the Obama administration as its ambitious BRAIN initiative. Yuste led the group of researchers that first proposed the BRAIN initiative and is currently a member of the NIH BRAIN advisory workgroup and of its Neuroethics Committee. Rafael Yuste is Professor of Biological Sciences and Neuroscience at Columbia University. He was born and educated in Madrid, where he obtained his MD at the Universidad Autónoma in the Fundación Jimenez Diaz Hospital. After a brief research period in Nobel Laureate Sydney Brenner’s group at the LMB in Cambridge, UK, he did Ph.D. studies with Larry Katz in Nobel Laureate Torsten Wiesel’s laboratory at Rockefeller University in New York. He then moved to the Physics Division of Bell Labs, where he was a postdoctoral student of David Tank and Winfried Denk in the Department of Biological Computation. In 1996 he joined the Department of Biological Sciences at Columbia University. In 2005 he became HHMI Investigator and co-director of the Kavli Institute for Brain Circuits at Columbia. Currently, he is director of the Neurotechnology Center (NTC), a center created by Columbia University in response to the President’s BRAIN initiative.

Prof. Yuste and his laboratory are pursuing a “reverse engineering” strategy to understand the function of the cortical microcircuit, a basic element of cortex architecture. To study these questions, Yuste has pioneered the development and application of laser imaging techniques, such as calcium imaging of neuronal circuits, two-photon imaging and photo-stimulation using caged compounds and optogenetics with holographic spatial light modulation microscopy. These technical developments have resulted in several patents, two of which are commercially licensed. Yuste has obtained many awards for his work, including that of New York City Mayor and the Society for Neuroscience’s Young Investigator Awards and is a member of the Spanish National Academies of Science and of Medicine.

Ametz ARZALLUS

Bertsolari, Basque Country

Born in Hendaye, he began to practice Basque improvised sung poetry at a very young age influenced by the atmosphere at his home. After attending Seaska School and Bayonne College, he studied journalism at the University of the Basque Country (UPV/EHU). He regularly writes for the weekly publication Argia and the daily newspaper Berria, and often collaborates with Euskadi Irratia (a local radio station which broadcasts exclusively in the Basque language). He has participated in numerous events and activities including talks, critical reflections in public and preparation and transmission of messages for public events. He has also taught Basque improvised verse singing at the Bertso Eskola in Hendaye, has won numerous written verse competitions, has written lyrics to many songs and has participated in many projects designed to merge the world of Basque improvised verse singing with other disciplines such as dance, poetry and music, for example. He has won the Bertsolari Championship of Navarre four times, and the Xilaba Bertsolari Xapelketa Competition three times. He came second in the Basque Country's Bertsolari Championship in 2009 and he is the present champion since 2013.

Pamela DIGGLE

University of Connecticut, USA

Pamela Diggle is a Professor and Head of the Department of Ecology and Evolutionary Biology at the University of Connecticut, USA. Her research focuses on plant development: how evolutionary changes in development produce new forms and how developmental process will affect plant responses to climate change. She has served her field of "Botany" as a Program Director at the US-National Science Foundation, as President of the Botanical Society of America, and is currently the Editor-in-Chief of the American Journal of Botany. She is committed to sharing her enthusiasm for plant through undergraduate teaching, summer intensive courses for graduate students, and outreach to elementary students in remote Alaskan villages.

Andoni EGAÑA

Bertsolari, Basque Country

Born on October 2nd in 1961 in Zarautz (Gipuzkoa). He currently lives in his home town, although he did spend a number of years in Vitoria-Gasteiz, the capital of both the province of Alava and the Autonomous Region of the Basque Country. He has a degree in Basque Philology. Nowadays, he is fully dedicated to creation works: not only he is well-known for being a Basque improvised verse singer (a bertsolari as they are known in the Basque language), but also for his writings and his television scripts. He has experimented with various different literary genres and has collaborated and collaborates often with the Basque press, writing opinion articles. He has brought out an album featuring a collection of his own verses and has written songs for other singers too. From the end of the 1980s onwards, and particularly during the 1990s, he has been one of the most respected and recognised names in the world of Basque improvised sung poetry. Andoni Egaña stands out as well for his work as a researcher, scholar and theoretician, and has made seminal contributions to the analysis and dissemination of the creative process involved in Basque improvised poetry. He has participated in numerous experiences seeking to bring together the world of improvised verse singing and other forms of expression such as dance, accordion (or trikiti) playing, poetry and music, etc. He has been a Board member of the Association of Friends of Bertsolaritza for many years and was formerly head of its Research Department. He won the Bertsolari Championship of the Basque Country four times, in 1993, 1997, 2001 and 2005.



Itziar LAKA

**University of the Basque Country (UPV/EHU),
Basque Country**

Itziar Laka is a Professor at the Department of Linguistics and Basque Studies, and director of the research group The Bilingual Mind. She earned her PhD in 1990 from the Massachusetts Institute of Technology with a thesis entitled *Negation in Syntax: On the Nature of Functional Categories and Projections*, which was later published by Garland in 1994, and lectured in Linguistics at the University of Rochester (New York) from 1990 to 1995. She has been a guest lecturer at the Universities of Vienna, Utrecht, Naples and Río de Janeiro, and a guest research fellow at the Netherlands Institute for Advanced Study in Humanities (NIAS) and the Ortega y Gasset University Institute in Madrid, among others. She is a corresponding member of the Royal Academy of the Basque Language and author of *A Brief Grammar of Euskara, the Basque Language* (1996), which is freely available on the Internet. Her research combines linguistic theory with experimental psycho-neurolinguistic methods for studying the neural representation and computation of language, focused mainly on syntax and bilingualism.

Maialen LUJANBIO

Bertsolari, Basque Country

Maialen Lujanbio has a degree in Fine Arts, and her passion, the art of Basque improvised verse singing, is today her profession. She began practising bertsolaritza, as the art is known in the Basque language, at the Bertso Eskola (improvised Basque verse school) and made her debut in the inter-verse schools contests. In 2003 she won the Gipuzkoa Bertsolari Championship, in 2001, 2005 and 2013 came second in the Basque Country's Bertsolari Championship and became champion in 2009. In addition to Basque improvised verses she has also embarked on a number of other creative projects. From 2006 to 2011 she worked with Judith Montero and Xabier Erkizia to implement a project called Ornitorkinkus, an initiative which merges experimental music, sound and words and which gave rise to the book-album "Ornitorkinkus". In 2011 she created the radioperformance "Txori Mugariak" with Xabier Erkizia, and in 2013 worked on the project "Hegi, Egia, Egiak". She regularly collaborates with Euskadi Irratia (a local radio station which broadcasts exclusively in the Basque language) and gives talks in many towns, as well as at the University of the Basque Country (UPV/EHU), about the use of Basque in the workplace. She has collaborated with the weekly publication Argia and the daily newspapers Egunkaria and Berria, among others. Maialen Lujanbio lives in close contact with words, and in particular, with the world of bertsolaritza.

Juan Ignacio PÉREZ

**University of the Basque Country (UPV/EHU),
Basque Country**

Professor in Physiology at the University of the Basque Country (UPV/EHU). He has researched the physiology of marine animals at different scientific institutions in Europe and has served as both Vice-Rector (1997-2000) and Rector (2004-2009) of the UPV/EHU. He is a member of Jakiunde, the Academy of Sciences, Arts and Letters, and the FECYT (Spanish Foundation for Science and Technology) Science and Technology Council. He regularly collaborates with different media in science social communication activities, and is currently the Coordinator of the Chair in Scientific Culture at the University of the Basque Country (UPV/EHU).

Kirmen URIBE

Writer, Basque Country

Kirmen Uribe (Ondarroa, 1970) is one of the most widely-read and commonly-translated Basque-language authors. After studying Basque Philology in Vitoria-Gasteiz (University of the Basque Country, UPV/EHU) he moved to Trento (Italy) to do a postdoctoral degree in Comparative Literature. His first novel, *Bilbao-New York-Bilbao*, won the National Prize for Literature in 2009 and became a global phenomenon, translated into 15 different languages. In the United Kingdom, it was included by the bookstore Foyles in its list of the 15 best books of the year. His previous book of poems, *Bitartean heldu eskutik (Meanwhile take my hand)*, garnered much critical and public acclaim (it won the Critics Award in Basque and was published in English in the USA). His latest novel, *Mussche* (That which moves the world), is the first novel written in Basque to be published in China. Uribe has been invited to speak at many prestigious universities, including Stanford, Chicago, Oxford, UCSD, NYU and Washington University, where next year he will be a Massie Lecturer in literature. His work has been featured in publications such as The New Yorker, El País and Berria.

Xurxo MARIÑO

Universidade da Coruña, Spain

Xurxo Mariño has a PhD in Biology from the University of Santiago de Compostela, and currently lectures in the Department of Medicine at the University of A Coruña. He is a member of the Neurocom research group at that same university, has published research papers in a number of specialised journals and has collaborated with the Massachusetts Institute of Technology (MIT). He often participates in science dissemination activities, striving to foster greater interaction with the rest of humanities. He is the author of several books, including: "Os dados do relóxeiro", "Po de estrelas" and "Neurociencia para Julia"; and contributes to the online platform Naukas. He organises "scientific café-theatre events" and engages in other dissemination activities such as "Discurshows", a hybrid format which is part talk and part performance. In 2011 he was awarded the Special Jury Prize at the "1st FECYT Competition of Scientific Communication", and in 2014 won the Tesla Award for Dissemination.



Pedro Miguel ECHENIQUE

President of DIPC and Professor at the University of the Basque Country (UPV/EHU)

Chairman of Passion for Knowledge 2016

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Professor of Condensed Matter Physics at the University of the Basque Country (UPV/EHU), President of the Donostia International Physics Center (DIPC), President of CIC nanoGUNE and Deputy President of the Euskampus Fundazioa, the foundation of the UPV/EHU International Campus of Excellence. He is also Honorary President of Jakiunde, the Basque Academy of Sciences, Arts and Letters.

He has received numerous awards and distinctions, including the Euskadi Prize of Research (1996), the Prince of Asturias Award for Scientific and Technical Research (1998), the Max Planck Physics Prize (1998), the Blas Cabrera National Research Prize (2005) and the Gold Medal of the City of San Sebastian (2000), among others. He is also Doctor in Science from the University of Cambridge (1998) and has been named Doctor Honoris Causa by another four universities.

In addition his work as a researcher, with over 400 papers published in specialised journals and over 200 invited talks given at international conferences and prestigious universities and institutions all over the world, over recent years he has dedicated much effort to promoting science as a cultural activity and to highlighting the importance of a scientifically well-informed society. **Passion for Knowledge** is a shining example of this.

Passion for Knowledge is organised by the Donostia International Physics Center (DIPC).



It is a singular research center created in 2000 with the main goal of promoting and catalysing high-level basic research in Condensed Matter Physics and Materials Science. Since its creation, DIPC has been an open institution, linked to the University of the Basque Country (UPV/EHU).

Excellence in research

Since its very conception DIPC has stood for the promotion of excellence in science. This tall order demands a platform in which ideas are freely exchanged, new objectives are set and shared, and new personal bonds established. DIPC is a space in which the enthusiasm for discovery reigns over bureaucracy, convention and routine, which attracts world-class scientists who become involved in running exciting scientific projects at the frontier of science.

The DIPC highly dynamic research community is nucleated around the great scientific talent of the UPV/EHU, which plays host to a large international visiting researchers community.

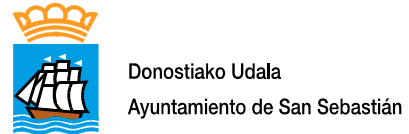
Excellence in communication

DIPC is a center devoted to research at the cutting-edge of science, but it also assumes the responsibility of conveying scientific knowledge to society, because scientific culture contributes to the progress and freedom of society. The center offers meeting points for the scientific community and organises events to bring science to the citizens. In this way DIPC attempts to trigger curiosity, interest, fascination, enthusiasm and passion for knowledge, especially among young people, showing science as a cultural activity accessible and attractive to all audiences.

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