The BBVA Foundation presents its Frontiers of Knowledge Awards at a ceremony enthroning science and culture as motors of development

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- The BBVA Foundation Frontiers of Knowledge Awards, established in 2008, recognize research and creative work of excellence. Their eight categories address the main scientific, technological, social and economic challenges of the present day

Madrid, June 21 2012.- From a fundamental discovery like that of the first extrasolar planet, which urges us to reflect more deeply on life in the universe, to such landmark achievements in human progress as the eradication of smallpox: the presentation ceremony of the BBVA Foundation Frontiers of Knowledge Awards, which took place today in the Marqués de Salamanca Palace, Madrid headquarters of the BBVA Foundation, became a journey round some of the universal milestones of science and culture in company of their authors. The diversity of the areas addressed and the huge impact of the contributions being recognized reflect the guiding purpose of these awards: to enthrone knowledge in all its breadth as a motor of development.

The awards in this edition go to Alexander Varshavsky, for identifying the mechanisms involved in protein degradation; Isaac Held, for his discoveries on atmospheric circulation and the role of water vapor in climate change; Michel Mayor and Didier Queloz, for discovering the first extrasolar planet; Ciro de Quadros, for his work in eradicating smallpox; Angus Deaton, for his contributions to the theory of consumption and savings and the measurement of economic wellbeing; Daniel Janzen, for his insights into the functioning of tropical ecosystems and his efforts on behalf of their conservation; Carver Mead, for enabling the

development of the billion-component microchips ubiquitous in our daily lives; and Salvatore Sciarrino, for renewing the possibilities of vocal and instrumental music.

The ceremony, under the presidency of Spain's Minister of Education, Culture and Sport, José Ignacio Wert, BBVA Foundation President Francisco González, and CSIC President Emilio Lora-Tamayo, welcomed eminent representatives of the international scientific community as well as leading figures from the worlds of business and the arts.

These awards, affirmed Francisco González, spring from BBVA's conviction that "our collective possibilities, and those of families, individuals and corporations, depend more than ever on the advance of scientific knowledge and innovation." For this reason, added the President of the BBVA Foundation, "We are fully committed to supporting scientific research and cultural creation. And one expression of this support is, precisely, to recognize the individuals who have contributed outstandingly to extending the frontiers of their respective fields."

The Minister of Education, Culture and Sport, José Ignacio Wert, praised the BBVA Foundation for its engagement: "It is vitally important that civil society gets behind this kind of initiative. In a country where we ask and expect the public sector to solve all our problems, it is particularly gratifying to count on the collaboration of civil society not only in funding scientific and artistic endeavor but also in giving it much deserved recognition."

Emilio Lora-Tamayo, President of the Spanish National Research Council (CSIC), chose to stress the prestige that the awards have won, "due, in my opinion, to three factors as simple in their formulation as they are hard to apply in a systematic and honest fashion: the continuity of the promoter's support, the excellence of the awardees, and the exacting standards of the juries, in which CSIC participates."

SUPPORT TO SCIENCE AND CULTURE

Established in 2008, these awards aspire to be both showcase and tribute to those who dedicate their efforts to the advancement of knowledge and innovation. In the persons of the laureates here tonight, the BBVA Foundation adds to its aim of disseminating science and culture the possibility of recognizing and upholding the values they represent: namely, hard work, enthusiasm and the determination to look beyond the legacy of past generations.

The BBVA Foundation President held up the awardees as solid proof that "success and excellence are the sum product of a genuine passion to understand and create and the courage to explore hitherto uncharted terrains of knowledge."

The awards are fully congruent with the knowledge map of the 21st century, with eight categories stretching from classical disciplines like Basic Sciences;

Economics, Finance and Management or Biomedicine to others addressing the challenges of our time, like Development Cooperation, Climate Change, Ecology and Conservation Biology, Information and Communication Technologies and Contemporary Music, or extending the boundaries of our aesthetic and cultural universe.

The architecture of the awards is founded on the quality, rigor and independence of the eight international juries, one for each category, who are tasked with evaluating the nominations put forward by the world's most prestigious teaching and research institutions.

These international awards have been devised and developed in Spain with assistance from the Spanish National Research Council (CSIC), and form part of the BBVA Foundation's broad-ranging support program for scientific knowledge and cultural creation. Support that stands undiminished despite the current climate, evidencing the strength of the BBVA Group's commitment. Its chairman, Francisco González, has a positive message in this respect: "Although the gravity of the problems facing Spain may lead some to think that our economy, our research strength and our capacity to innovate and create wealth are in a place of stasis or, worse, decline," this is a country which has carried through far-reaching structural changes in the past decades and where knowledge-based assets and activities account for a growing share of the national economy. "The most dynamic, forward-looking part of our productive and financial structure is responding positively to the challenges."

RESEARCHING FOR A BETTER WORLD

In their acceptance speeches during the ceremony, the laureates talked about the researcher's duties of social responsibility, the purity of the knowledge quest and the necessity of innovation.

Ciro De Quadros (Executive Vice-President of the Sabin Vaccine Institute, United States): Vaccines improve the wealth of the world

"This is the most memorable honor I have ever received. With the Frontiers of Knowledge Award connection between public health and economic development, the BBVA Foundation sends out a very strong message, indicating that vaccines improve not only the health, but the wealth, of the world. And this message is particularly timely, as we initiate the Decade of Vaccines, the first decade of what I call the Century of the Vaccines.

It can almost be considered a public health miracle that today we register immunization coverage of 80% or even 90% in some of the poorest countries in the world. (…) Despite these magnificent advances, we must also overcome the massive challenge posed by the inequity faced by the poorest countries who do not have access to the miracle of vaccines. It must not be the case that the benefits of science and technology are available only to the most privileged."

Carver Mead (professor at the California Institute of Technology, Caltech, United States): Innovation involves risk, but the risk of not innovating is incomparably

greater

"When I was a young boy, electronic information was embodied primarily in the telephone network and in broadcast radio. Today it has become the world's most diverse and prosperous industry – its products and services touching every human on the planet. I have been privileged to contribute to the evolution of this great human endeavor, and am grateful that those contributions have been deemed worthy of the Frontiers of Knowledge Award.

[Between 40 and 50 years ago] new ideas were universally greeted with 'That is totally wrong – it can't possibly work.' Then, after much time and effort 'Well, maybe in some special circumstance…' and finally, after success is clearly evident 'Yes, of course – everyone knows that.' (…) There are lessons here for new innovators: Expect criticism and opposition. Learn from your mistakes and press forward. (…) If you fail at one enterprise, there will be another opportunity for success. After success comes, help the next innovator.

There are also lessons for those entrusted with public policy: Innovation, by its very nature, involves risk. But that risk pales compared with the risk of not innovating."

Angus Deaton (professor at Princeton University, United States): Celebrating knowledge creation in times of peril

"The use of reason to create knowledge that could improve society and the lives of individuals, an enterprise that began with the European Enlightenment, has been the basis for the unprecedented progress in living standards, health, and governance over the last 250 years. Yet we live in a time not only when economic success is threatened, but where the very ideas of the Enlightenment are under attack. It is therefore an especially appropriate time for the BBVA Foundation, through its Frontiers of Knowledge Awards, to celebrate the creation of basic knowledge and to affirm its central importance in our common future."

Michel Mayor and Didier Queloz (professors at the University of Geneva, Switzerland): In search of other worlds

"The discovery and study of planets orbiting stars other than our own sun is a new frontier that astrophysics has now crossed. This award recognizes the results of more than twenty years' work by Didier Queloz and myself: from the discovery of the first extrasolar planet orbiting the star *51 Pegasi* to our current projects. (...) Today, we know of more than 700 extrasolar planets. These discoveries have revealed an astonishing diversity among planetary systems. (...)

Nearly 500 years after humanity first set out to explore and conquer our own globe in its entirety, we are turning toward the cosmos, seeking answers to questions such as: Are we alone in the universe? Is life a cosmic imperative? In other words, will life develop whenever the right physical and chemical conditions are in place?"

Isaac Held (physicist working in the U.S. National Oceanic and Atmospheric Administration, NOAA): Researching under pressure

"In climate science there are strong pressures to find answers to the big questions

as soon as possible, like how carbon dioxide emissions will affect the weather and climate of the world, individual countries and regions. But there are areas of great uncertainty that constrain our ability to answer this question in detail - ranging from how the cloud distribution over our planet will change, to how the oceans will take up heat and carbon, to how the terrestrial biosphere will react to the increased carbon (…). Resolving these problems will take time.

This tension between the needs of fundamental research and the desire to answer the questions that the world needs us to answer quickly is not unique to climate science, but we feel this tension very strongly."

Daniel Janzen (professor at the University of Pennsylvania, United States): Conserving biodiversity is compatible with development

"This award is also in honor of the many hundreds of Costa Rican biodiversity managers, administrators and conservation biologists who have invested many decades in conserving their complex tropical ecosystems (...), and doing it transparently, as an example for the world. For me, all of this is 'conservation by means of non-damaging biodiversity development', or, more simply, biodevelopment.

A pillar of this conservation has been the restoration of damaged ecosystems - mostly by allowing them to restore themselves and by resident biodiversity caretakers helping it along. "

Alexander Varshavsky (professor at California Institute of Technology, Caltech, United States): A small protein essential to life

"The work of our laboratory (...) has focused on the understanding of how and why cells destroy their own proteins in order to divide, to protect themselves from stress, and to form new kinds of cells. (...) We were fortunate to understand the fundamental biology of these processes, which center on a small protein called ubiquitin and underlie a staggering number of things that cells do in their daily lives. The field of these studies, initially very small, later grew to become both vast and diverse.

(...)Viewed as a dynamic body of self-improving knowledge and insight, science is remarkably and refreshingly even-handed. To biology, a deer, a microbe, and a human being are equally worthy of noting and understanding."

Salvatore Sciarrino (composer, Italy): Sounds in movement

"My music consciously tries to be suitable for human beings, to be communicative. It starts from the body. It doesn't reside in subjectivity (the emotions of the composer) or in objectivity (the relationships that are internal to the writing); it is therefore neither subjective nor objective. If anything is at the core, it is the individual listener.

In accordance with this aesthetic shift, the work becomes an experience of perception. I conceive sounds in movement, environmental events at the limit of

what is perceptible: I represent a sort of *theatre of listening*. There are no longer pieces of music, but rather pieces of reality in which object and subject, instrument and performer become fused in an elliptical space, a permanent and mysterious non-place that keeps us in suspense, on alert, where the spectator is the protagonist. Silence is not simply a background, far from it - it coincides with the re-setting of the mind. This is not happy or sad music. It is a creative medium for stimulating self-awareness."

FRONTIERS ARTWORK

All awardees were presented with an artwork by sculptor Blanca Muñoz (Madrid, 1963), based on a series of spirals that represent the progress and interrelation of scientific disciplines. The spiral, in the words of the author, "is the optimal solution for growth in a limited space as well as the best way to represent continuity."