

The BBVA Foundation celebrates the transformative power of knowledge at the Frontiers Awards ceremony

- “Here at this ceremony, we celebrate knowledge, which transforms our lives in every way: generating technology, enriching thought and contributing to change attitudes,” said Francisco González, President of the BBVA Foundation.
- Ecologist Eeva Furman, widow of laureate Ilkka Hanski, announced that the award money will go to develop a network of small protected areas in Finland.
- The Frontiers Awards were established in 2008 to recognize advances in areas congruent with the knowledge map of the 21st century. Their eight categories range from classical disciplines to some of the major challenges of our time, like climate change or development cooperation.

Madrid, June 21, 2016.- The presentation ceremony of the BBVA Foundation Frontiers of Knowledge Awards again transformed the Marqués de Salamanca Palace, Madrid headquarters of the BBVA Foundation, into a window from which to contemplate some of the key ideas, insights and challenges that define the modern age. From the discovery of how the galaxies were formed to the construction of mathematical models to help preserve biodiversity; from the development of an astoundingly precise technique for studying the living brain to the drawing of a “global line” for the measurement of extreme poverty, the roll of achievements of the laureates in the eighth edition attests to the huge transformative power of knowledge.

“We are celebrating something that underpins our way of life: science-based knowledge. Referred to at times as a “life support system,” for without it we would be unable to perform our daily functions,” remarked BBVA Foundation President Francisco González. “Science teaches us about the causes of the planet’s current state, generates technology with which to confront new problems, and contributes to transform both individual thought and the culture of society. [...]”

The advances of science configure our cultural software, our rationally-based beliefs."

"Unfortunately, alongside these beliefs are others that uphold fanaticism and intolerance. And that is why supporting and recognizing science as an individual and collective construct is among the most potent tools we have to preserve our freedoms and wellbeing in the global society of the 21st century. It is those convictions that inform and give meaning to the Frontiers of Knowledge Awards."

The ceremony was attended by Spain's Secretary of State for Research, Development and Innovation, Carmen Vela; the President of the Spanish National Research Council (CSIC); the rectors of the universities of Helsinki and Tel Aviv; and scientists and creators of international standing, among other personalities.

The awardees in this edition are physicists Stephen Hawking and Viatcheslav Mukhanov in Basic Sciences, for discovering how the galaxies were formed; neuroscientists Edward Boyden, Karl Deisseroth and Gero Miesenböck, for the development of optogenetics; ecologist Ilkka Hanski for work that has laid the basis for combating species extinction; mathematician Stephen Cook, for defining what computers can and cannot solve efficiently; economist Robert Wilson, for his contributions to analysis of strategic interactions when economic agents have limited information; climatologist Veerabhadran Ramanathan, for discovering that other gases and contaminants are altering Earth's climate besides CO₂; economist Martin Ravallion, for setting a global extreme poverty line; and maestro Georges Aperghis, for reinventing music theater and enriching its language.

The BBVA Foundation Frontiers of Knowledge Awards were established in 2008. Their name alludes to the pioneer spirit of researchers, who wrest terrain from the unknown building on the progress of their predecessors, and also to the interdisciplinary, cross-border nature of knowledge. Their eight categories wed classical modalities like Basic Sciences, Biomedicine or Economics, with other, more innovative areas addressing key challenges of the 21st century: Climate Change; Ecology and Conservation Biology, and Development Cooperation. They are funded with a total of 3.2 million euros, distributed equally across all categories.

Awards in each category are decided by a jury formed by international experts in the subject area. The names of the winners are released successively in the months of January and February; each jury deliberates for one day behind closed doors, announcing its decision the following morning. Nominations are received from academic and cultural institutions the world over, and are kept confidential even after the award has been made public.

Will synthetic life come to compete with the life existing for the past 3.5 billion years?

The public at the ceremony had the chance to see a video of the acceptance speech recorded by Ilkka Hanski shortly before his death on May 10 this year. In it, Hanski shares his concerns about “the survival of the 3.5-billion-year-old life that has existed on our planet, and which is now severely challenged by the ever more powerful forces that we humans are unleashing.” He also reflects upon “the new life emerging from synthetic biology labs,” and the possibility that it might escape into the wider environment: “Will there be peaceful coexistence between the two forms of life, or fierce competition?” For Hanski, this award was “a handshake across Europe, from the South to the North, highlighting the importance of a unified European science.”

His award was collected by his widow, fellow ecologist Eeva Furman, who announced that the money will be used to develop a network of protected areas for research in Finland, “in a corner of the country where Ilkka spent all his childhood summers, became enthusiastic about nature and did his first research experiments.”

Stephen Hawking, addressing the public through a satellite link, related how he and Viatcheslav Mukhanov had arrived independently, in parallel fashion, at the finding that won them the award.

Mukhanov, meantime, spoke about how our vision of the cosmos has changed radically in a few short years, and admitted that he never thought his theory would be proven: “At the beginning of the eighties, cosmology was still the field of wild speculations [...]. It was impossible even to imagine that the predictions of our theory could ever be checked. [...] But thanks to the remarkable technological progress of these years [...], it became possible to check the most refined predictions of the theory of the quantum origin of the Universe's structure.”

A field of medicine that “unfortunately lags far behind”

Karl Deisseroth, speaking on behalf of the three winners in Biomedicine, explained that optogenetics will advance our understanding of “how the brain works, and how neural activity controls behavior.” He also stressed its potential to improve the treatment of conditions like schizophrenia, Parkinson's disease, addiction, anxiety, autism or depression, adding that all this was happening in a field of medicine which “unfortunately lags far behind others in terms of deep understanding of the intact living organ.”

Martin Ravallion pointed out that roughly one billion people worldwide are living in extreme poverty, a large figure that nevertheless is significantly smaller than in the past. In this sense, “the world's overall success in fighting poverty is undeniable. [...] “it is now more credible than ever that the world can virtually eliminate such extreme poverty within a generation.” But this, he insisted, does not mean there is

an easy road ahead: "We have documented both successes and failures. Economic growth has generally reduced absolute poverty. But it has helped little for reducing relative poverty or inequality. We are seeing rising numbers of relatively poor people in the world, alongside falling numbers of absolutely poor. And the very poorest have often been left behind."

"The inaction of governments frustrated me"

Veerabhadran Ramanathan stressed that "without drastic mitigation actions, climate change can soon become an existential threat." And he explained why it has become his mission to transmit this message to more and more people: "By the time I turned sixty, climate change was no longer an academic pursuit but a serious threat that I had to do something about. We have already dumped enough pollutants to warm the planet by more than 2°C. Our children would witness a climate unlike any that has been experienced in the last one million years. The inaction by governments frustrated me. My entire career seemed like a colossal waste. You can imagine my euphoria when Pope John Paul II elected me to the Pontifical Academy of Sciences in 2004. There I realized the potential of the church to play a transformational role in changing public opinion towards climate change."

Stephen Cook (Information and Communication Technologies) talked the public through his famous P versus NP problem, considered one of the hardest in mathematics: "P and NP are classes of computational problems, with precise mathematical definitions. Intuitively, we think of P as set of problems that can be solved feasibly by computers, while NP is a larger class of problems which includes problems in P, but presumably also includes problems which are too difficult for computers to solve in a reasonable length of time. In general the computer science community believes that the supposedly hard problems in the class NP are really hard, and are not in the easy class P. However no one has been able to prove this."

Economics laureate Robert Wilson explained that "our aim was to study how private information and imperfect observation affect strategic behavior, and thus the performance of markets. [...]. Economists are now very aware of informational effects, and students learn about them. Applications include better models for use in experimental and empirical studies, and practical suggestions for improving the organization and regulation of particular markets."

Georges Aperghis (Contemporary Music) looked back upon his work: "For the last three decades I have pursued the ideal of plurality in many different ways: dialoguing with artistic traditions from outside Europe, playing with the plurality of Non-European languages – real or invented, extending polyphony to other arts, techniques and media like video or informatics. I hope I have succeeded in talking about our world without ever ceasing to interrogate the very nature of music."

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