The Climate Change category leads off the seventh edition of the awards.

**The BBVA Foundation Frontiers of Knowledge Award goes to Richard Alley, the “interpreter” of ice who uncovered the evidence of sudden climate changes**

- The American glaciologist has used his understanding of the mechanics of ice formation, deformation and flow to explain how the planet’s frozen masses have interacted with the climate throughout time.

- Alley considers it “optimistic” to think that climate change must always be gradual, and advocates planning ahead using the scientific knowledge we have at our command.

**Madrid, January 9, 2015.**—The BBVA Foundation Frontiers of Knowledge Award in the Climate Change category goes in this seventh edition to U.S. glaciologist Richard Alley for his “pioneering research” into the “mechanics of ice and its implications for abrupt climate change,” in the words of the jury’s citation.

Jury member Miquel Canals refers to Alley as “our best interpreter of ice. Although there are others working in different aspects of the field, he is the one who completed the circle: in ice he has read the history of the atmosphere, with its phases of abrupt change. He has elucidated its mechanisms of formation and deformation and how it interacts with climate. Alley explains the present while keeping a window open to the past and analyzing possible future paths.”

Ice is an archive of climate information. Alley, for instance, has studied ice cores that show the composition of our atmosphere over thousands of years,
with sufficient precision to reconstruct past climate year by year in regions such as Greenland.

In doing so, he detected several instances in the last 12,000 years when average temperatures in large regions of the planet changed dramatically in under three years. This was the first evidence that climate variations could occur so abruptly.

Richard Alley (Ohio, 1957), a professor at The Pennsylvania State University (United States) declared himself “very happy” on being informed by phone of the award, adding that “the list of previous winners is a remarkable group.” With this recognition, he believes, “the BBVA Foundation is helping people see the benefit we get from environmental sciences, and how much they can contribute to our wellbeing.”

A career devoted to ice

Alley completed his PhD in geology at the University of Wisconsin-Madison in 1987. He also took courses in physics, metallurgy and materials science. In his freshman year, in 1977, he got a summer job with a glaciologist who was studying the radioactive layer that atom bomb testing had left behind in the Antarctic and Greenland ice sheets. “And I’ve been working on ice ever since,” he remarked yesterday.

His first major insight came when still a PhD student. He had begun to study how snow turned into ice at the polar caps, analyzing the density of the snow, the size of its grains, its movement and other characteristics. In this way, at age thirty, he was able to establish a new paradigm in understanding how glaciers work, how they flow and how they respond to climate change.

He also “gained the ability to recognize annual layers in the ice cores we were studying,” he explained yesterday. “So when we went to Greenland and drilled the ice cores I was able to extract more information than had previously been possible, so we could develop a more detailed chronology of past climate change.”

It was in the course of this work, in 1993, that he made the discovery that North Atlantic temperatures had varied significantly over a short space of time during the Younger Dryas cold period, between 12,800 and 11,500 years ago. Some years later, he would identify a similar period of abrupt climatic change occurring just 8,200 years ago.

“We were very surprised that it was that fast,” he now recalls. “And this has a broader lesson for people. For when we think about climate change, we usually draw a smooth curve, as if it is something we can see coming and prepare for. But that is being very optimistic. I think it is wiser to heed the saying ‘hope for the best and plan for the worst.’ Assuming that we will get the best might not always be the wisest path forward.”
The main message he would like to convey to society is: “We would be much better off if we planned ahead using the science we have on climate change.”

Alley continues his research into the behavior of ice. He has taken part in over a dozen campaigns in Greenland and Antarctica, and on glaciers the world over. One area he returns to assiduously is West Antarctica, where, according to the accumulated evidence, the effects of climate change on glacier stability are most likely to be felt – an event which, if it occurs, would have consequences on a global scale.

He has also become one of our leading climate communicators. As the citation states: “Dr Alley’s work and his passionate ability to communicate climate system science have alerted our society to the risks, in a warming world, of rapidly disintegrating ice sheets and abrupt regional climate changes.”

Bio notes

Richard B. Alley obtained a PhD in geology from the University of Wisconsin-Madison in 1987. He has since pursued his academic and research career at Pennsylvania State University, where he has held a professorship since 1998.

He has served on numerous national and international committees concerned with climate change. In particular, he was lead author of the chapter “Changes in Snow, Ice and Frozen Ground” for the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), and a contributing author to the second and third IPCC reports.

In 2014, he chaired the research panel of the U.S. National Academy of Sciences which prepared the influential report “Abrupt Impacts of Climate Change. Anticipating Surprises”.

Author of over 240 publications with over 13,000 citations, he is regularly called on to advise governments and institutions. An able communicator, his outreach and awareness-raising efforts on climate change include the book The Two-Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future, and the TV series Earth: The Operators’ Manual (screened by the Public Broadcasting Service in 2012). He is a member of the National Academy of Sciences and the American Academy of Arts and Sciences and, since 2014, a foreign member of the Royal Society.

About the BBVA Foundation Frontiers of Knowledge Awards

The BBVA Foundation promotes, funds and disseminates world-class scientific research and artistic creation, in the conviction that science, culture and knowledge in its broadest sense hold the key to a better future for people. The Foundation designs and implements its programs in partnership with leading scientific and cultural organizations in Spain and abroad, striving to
identify and prioritize those projects with the power to move forward the frontiers of the known world.

The BBVA Foundation established its Frontiers of Knowledge Awards in 2008 to recognize the authors of outstanding contributions and radical advances in a broad range of scientific, technological and artistic areas congruent with the knowledge map of the late 20th and 21st centuries, and others that address central challenges, such as climate change and development cooperation, deserving of greater social visibility and recognition.

Their **eight categories** include classical areas like *Basic Sciences* (Physics, Chemistry and Mathematics) and *Biomedicine*, and other, more recent areas characteristic of our time, ranging from *Information and Communication Technologies*, *Ecology and Conservation Biology*, *Climate Change* and *Economics*, *Finance and Management* to *Development Cooperation* and the innovative realm of artistic creation that is *Contemporary Music*.

The **juries** in each category are made up of leading international experts in their respective fields, who arrive at their decisions in a wholly independent manner, applying internationally recognized metrics of excellence. The BBVA Foundation is aided in the organization of the awards by the **Spanish National Research Council (CSIC)**, the country’s premier multidisciplinary research body. As well as designating each jury chair, the CSIC is responsible for appointing the Technical Evaluation Committees that undertake an initial assessment of candidates and draw up a reasoned shortlist for the consideration of the juries.

Committee members in the Climate Change category were Daniel Oró, CSIC Research Professor at the Mediterranean Institute for Advanced Studies (CSIC); Xavier Querol, CSIC Research Professor in the Institute of Environmental Assessment and Water Research; and Fernando Valladares, CSIC Research Professor in the Spanish Museum of Natural Sciences.

**Climate Change jury**

The jury in this category was chaired by Bjorn Stevens, Director of the Max Planck Institute for Meteorology (Germany). The secretary was Sandrine Bony, senior scientist at the Laboratoire de Météorologie Dynamique (LMD), run jointly by the Centre National de la Recherche Scientifique and University Pierre et Marie Curie (France). Remaining members were Miquel Canals, Chairman of the Department of Stratigraphy, Paleontology and Geosciences at the University of Barcelona; Carlos Duarte, Director of the UWA Oceans Institute at the University of Western Australia; Martin Heimann, Director of the Department of Biogeochemical Systems at the Max Planck Institute for Biogeochemistry (Germany), and Edward S. Rubin, Professor of Engineering and Public Policy at Carnegie Mellon University (United States).
Previous laureates

The award in the last edition went to U.S. biologist Christopher Field, Director of the Department of Global Ecology at the Carnegie Institution for Science and a professor at Stanford University (United States), for discovering the importance of ecosystems and their effective management in the battle against climate change.

The winner in the fifth edition was Susan Solomon, a professor at Massachusetts Institute of Technology (MIT), for “her work on determining how human action alters the composition of the atmosphere and how these changes, in turn, affect the Earth’s climate.”

In the fourth edition, the award was granted to Isaac Held, a physicist working in the Geophysical Fluid Dynamic Laboratory at the U.S. National Oceanic and Atmospheric Administration (NOAA); recognized for “his fundamental and pioneering contributions to our understanding of the structure of atmospheric circulation systems and the role of water vapor in climate change.”

Preceding him were Nicholas Stern of the London School of Economics and Political Science, whose pioneering report shaped and focused the discourse on the economics of climate change and was the means to quantify the impacts and costs arising from the alteration of our planet’s climate, and, in the second edition, Klaus Hasselmann of the Max Planck Institute for Meteorology, for “developing methods which show that today’s global warming is mainly attributable to human action.” Finally, the winner in the first edition was Wallace Broecker of the University of Colombia, for his seminal contributions to the study of “global warming,” a term that he himself was first to employ.

UPCOMING AWARD ANNOUNCEMENTS

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LAUREATE’S FIRST DECLARATIONS AND IMAGES

A video recording of the new laureate’s first interview on receiving news of the award is available from the Atlas FTP with the following name and coordinates:

Server: 213.0.38.61
Username: AgenciaAtlas2
Password: mariposa

The name of the video is:

“PREMIO CAMBIO CLIMÁTICO PROFESOR RICHARD ALLEY”

In the event of connection difficulties, please contact Alejandro Martín at ATLAS:

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