
Bestowed by the Spanish Royal Society of Physics (RSEF) and the BBVA Foundation

The awards of the Spanish physics community champion science as a strategic activity with the power to advance social well-being

- “Science is not an optional extra” but a “strategic activity,” affirms Francisco González, President of the BBVA Foundation, adding that “increasing investment in research and development is an economic and political decision of the highest order”
- Spanish science not only has to contend with “a lack of sustainable and sustained funding,” González continues. We also need to “improve its management model,” mobilizing the involvement of “every available actor, from public universities and research centers to private-sector organizations”
- The medal of the Spanish Royal Society of Physics (RSEF) goes to Maciej Lewenstein for his international leadership in the quantum technologies field and his work to dynamize this area within Spain. Hernán Ruy Míguez takes the award in the Physics, Innovation and Technology category for developing photonic materials with such varied applications as solar energy capture, detection of fake banknotes or protecting the skin against UV rays
- The RSEF–BBVA Foundation Awards also have dedicated categories for young researchers and for physics teaching and communication. Their goals are to distinguish high-quality research, encourage early career research talent and foster innovation.

Madrid, December 14, 2017.- Physicists whose research has furthered the advance of transformative technologies like quantum cryptography or new photonic materials, and others working to expand the public's scientific culture, took center stage this evening at the presentation ceremony for the awards of the Spanish Royal Society of Physics (RSEF) and BBVA Foundation. Francisco González, the BBVA Foundation President, stressed the need for political leaders to equip themselves with greater scientific knowledge, to understand science's

value as a force for development and to promote it as a “strategic” activity, at an event held in the Foundation’s Madrid headquarters.

The RSEF–BBVA Foundation awards have been granted annually since 2007 to outstanding Spanish physicists, with particular attention to emerging research talent. The awards were established by the RSEF in 1958 and are now a standard fixture in the Spanish physics calendar, with a presentation ceremony that brings together many of the discipline’s leading experts.

For Francisco González, the event was a chance to reflect on the Spanish science system, whose weak point he described as “the obstacles faced by young researchers in forging a career; and not only young people but also members of the previous generation with an existing track record.” If this persists, he warned, “we run the risk of suffering a deficit of new ideas, generated at the leading-edge of science.” The goals, accordingly, must be scientific “excellence” but also a hiring system with “flexible mechanisms” that “attract and retain talent.”

Spanish science, he added, not only has to contend with “a lack of sustainable and sustained funding.” It is also crying out for a tighter management model that “mobilizes the involvement of all available actors, from public universities and research centers to private-sector organizations.”

Another challenge is a dearth of scientific culture. If science is to occupy its rightful place at the top of the policy agenda, González reflects, it is vital for the political class and wider public to realize that “science is not some optional extra. If we start from that principle, then researching with atoms cooled to absolute zero, or laminates a single-atom thick goes from being an “exotic” to a “strategic” activity. And boosting investment in research and development, instead of a concession to the scientific community, becomes a political and economic decision of the first order.”

The President of the Spanish Royal Society of Physics, José Adolfo de Azcárraga, devoted words to “the problem of the numbers gap between men and women working in physics.” In his view, “the relative scarcity of women engaging in scientific activity represents a huge loss of talent.” Azcárraga reminded the public that Spanish universities have fewer women pursuing science and engineering degrees than many of their counterparts elsewhere in Europe. “Physics,” he lamented, “is especially short of women,” a problem which the RSEF, he announced, would address in a future report on physics teaching in secondary schools.

Quantum technologies and new materials

This year’s RSEF Medal went to theoretical physicist Maciej Lewenstein, for his international leadership in the quantum technologies field and his work to dynamize this area within Spain. Lewenstein, a research professor at the Instituto de Ciencias Fotónicas (ICFO) in Barcelona, is among the scientists with the highest global impact ratings. He has worked on the development of quantum

simulators – special-purpose quantum computers – and quantum cryptography, applications he believes are the gateway to a whole new generation of quantum technologies waiting to arrive.

He is also widely known for his contributions in attosecond physics – an attosecond being one quintillionth of a second – exploring nature's fastest phenomena occurring at the smallest scales. The awards jury laid particular stock on his work to strengthen these areas in Spain by training more than thirty doctoral students and over fifty postdoc researchers.

This year's award in the Physics, Innovation and Technology category went to Hernán Ruy Míguez García for combining high-quality basic science with technology transfer. A research professor in the Instituto de Ciencia de Materiales de Sevilla of the Spanish National Research Council (CSIC), Míguez builds materials whose color – the way they reflect light – depends on their nanoscopic structure, an effect found in butterfly wings. Such materials also have the capacity to turn transparent.

Míguez appears as an inventor in 18 patents, several of them licensed to industry. He has also used two of these patents to set up companies, one in Canada and another in Sweden, to develop devices with such varied applications as the detection of counterfeit banknotes or protecting skin against UV radiation. Míguez is also currently collaborating with various Spanish firms.

The Young Researcher in Theoretical Physics Award was granted to Fernando de Juan Sanz, Marie Curie Fellow at the Rudolf Peierls Centre for Theoretical Physics in the United Kingdom, for his contributions in the physics of two-dimensional materials. De Juan has obtained outstanding results in the study of graphene and other single-atom-thick materials.

The winner in the Young Researcher in Experimental Physics category was Gabriel Lozano Barbero, a postdoctoral researcher at the Instituto de Ciencia de Materiales de Sevilla (ICMS) of the Spanish National Research Council (CSIC), for work in optoelectronics that has given rise to commercially important applications in artificial lighting. Seven of his eight patents are currently being exploited by Philips.

Remaining awards in this edition went to Bartolo Luque Serrano, in Physics Teaching and Outreach (University Education); Francisco Barradas Solas, in Physics Teaching and Outreach (Secondary Education); Raúl Toral, author of the Best Educational Article in RSEF publications; and Guillem Aromí, Alejandro Gaita-Ariño and Fernando Luis, authors of the Best Outreach Article in RSEF publications.

Juries

In the RSEF Medal, Young Researcher in Theoretical Physics and Young Researcher in Experimental Physics categories, jury members were:

Joaquín Marro Borau (President), Emeritus Professor in the Instituto Carlos I de Física Teórica y Computacional at the University of Granada and general editor of the Spanish Royal Society of Physics; **Javier Brey Abalo**, Professor of Theoretical Physics at the University of Seville; **Gerardo Delgado Barrio**, research professor at the Instituto de Física Fundamental, CSIC; **Rafael Rodrigo Montero**, research professor at the International Space Science Institute-Centro de Astrobiología (INTA-CSIC); **Luis Viña Liste**, Professor of Materials Physics at the Universidad Autónoma de Madrid; and **Félix Yndurain Muñoz**, professor in the Department of Condensed Matter Physics at the Universidad Autónoma de Madrid.

In the categories of Physics, Innovation and Technology, Physics Teaching and Outreach in University and Secondary Education, and Best Educational and Outreach Article in RSEF publications, the jury was formed by:

Joaquín Marro Borau (President), Emeritus Professor in the Instituto Carlos I de Física Teórica y Computacional at the University of Granada and general editor of the Spanish Royal Society of Physics; **Antonio Hernando Grande**, Professor of Magnetism and Magnetic Materials and head of the Instituto de Magnetismo Aplicado at the Universidad Complutense de Madrid; **Laura Lechuga Gómez**, head of the Biosensors and Bioanalytical Applications Group at the Instituto Catalán de Nanociencia y Nanotecnología; **José Manuel Sánchez Ron**, Professor of Science History at the Universidad Autónoma de Madrid and a member of the Real Academia Española; **José María Sanz**, Professor of Applied Physics at the Universidad Autónoma de Madrid; and **Manuel Yuste Llandres**, Emeritus Professor at the Universidad Nacional de Educación a Distancia.

Fundación **BBVA**

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