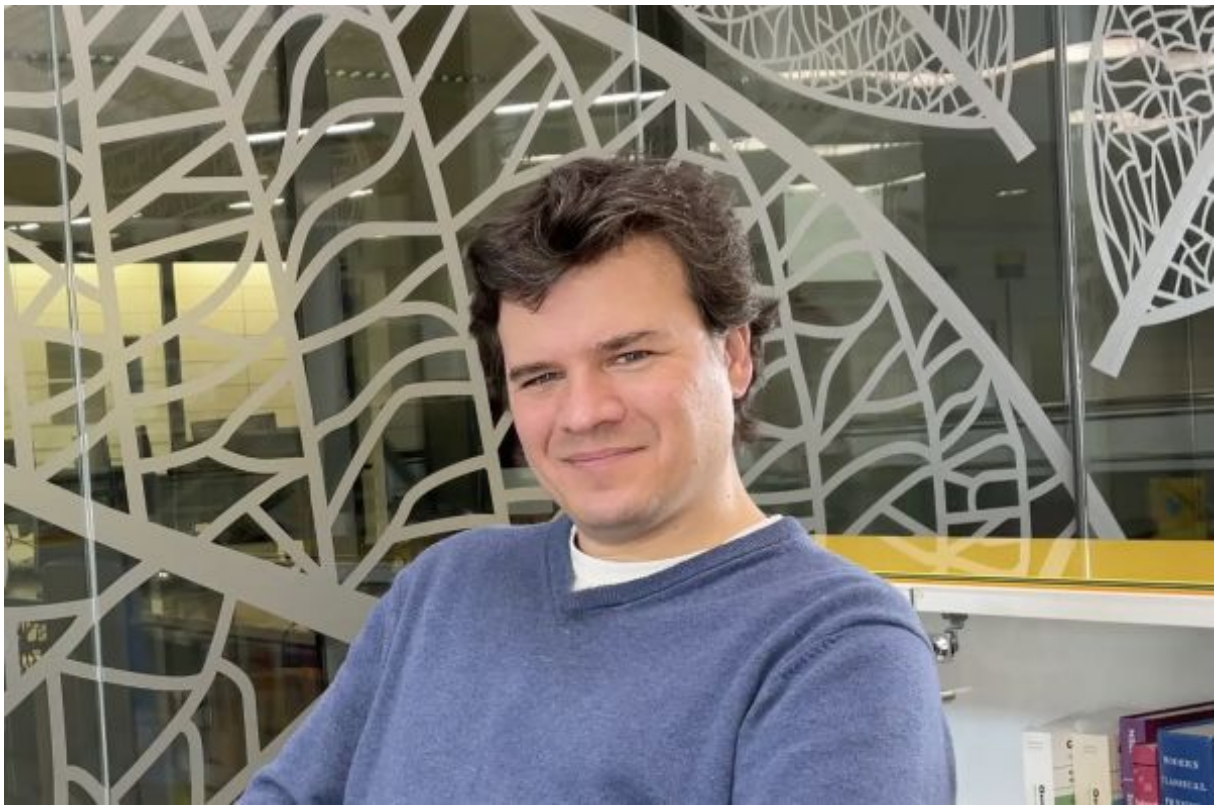

BBVA Frontiers of Knowledge Award honors Allan MacDonald and Pablo Jarillo-Herrero for the "Magic Angle" Discovery

Pablo Jarillo-Herrero, Professor at MIT and Distinguished Invited Professor at ICFO wins the BBVA Foundation Frontiers of Knowledge Award for his major contribution to the field of twistronics.

January 21, 2026

The BBVA Foundation Frontiers of Knowledge Award in Basic Sciences, which is one of the **world's most prestigious international prizes in science**, has been awarded to physicists Allan MacDonald, professor at University of Texas at Austin, and **Pablo Jarillo-Herrero**, professor at MIT, for their groundbreaking discovery of the so-called i¿½**magic angle**i¿½, a precise rotational alignment of 1.1 degrees between two layers of graphene that allows scientists to transform and control the properties of novel materials.

At MIT, Jarillo-Herrero led the experimental demonstration of this twisting effect with

graphene in 2018. By rotating two one-atom thick layers of this material by just 1.1 degrees between each other, his team revealed that the material can exhibit radically new behaviors, including superconductivity and insulating states. This work experimentally confirmed earlier theoretical predictions by MacDonald and gave rise to a new field known as **twistronics.**

As stated by the award committee, comprised by 7 core members and 21 supporting members, the work of MacDonald and Jarillo-Herrero has opened new frontiers in physics by enabling an unprecedented control over matter, with far-reaching implications for quantum technologies, advanced electronics, and energy-efficient systems, among others.

Jarillo-Herrero and ICFO

Jarillo-Herrero has been a Distinguished Invited Professor at ICFO since 2022 and has also been a principal investigator of the **QTWIST program at ICFO** since its inception. QTWIST brings together both ICFO researchers and internationally renowned scientists to advance the understanding and control of quantum materials through twist-engineered systems. Within this program, he works closely with ICFO researchers, professors **Frank Koppens, Carmen Rubio-Verdu, and Adrian Bachtold**, as well as other leading researchers in the field, reinforcing the institute's position as a global hub for two-dimensional quantum materials.

The nominating committee

The BBVA Frontiers of Knowledge Awards recognize achievements that fundamentally expand the boundaries of knowledge and hold strong potential for future technological and societal impact. This edition received 98 nominations covering 106 candidates. The awardee researchers were nominated by a committee including **Deepto Chakrabarty**, Professor and Head of the Department of Physics at the Massachusetts Institute of Technology (United States); **Kees Eijkel**, General Director at QuTech (Delft University of Technology, the Netherlands); ICFO (Barcelona), through its Director, **Oriol Romero-Isart**, and **Robert Sewell**, Vice-Director of People, Education and Culture; **Pablo Laguna**, Professor and Chair of the Department of Physics at The University of Texas at Austin (United States); and the Spanish Royal Physics Society through its President, **Luis Vina**.

ICFO warmly congratulates Allan MacDonald and Pablo Jarillo-Herrero on this outstanding achievement, which not only honors their past contributions but is also expected to further accelerate research in **twistronics** and the development of next-generation quantum and electronic materials.

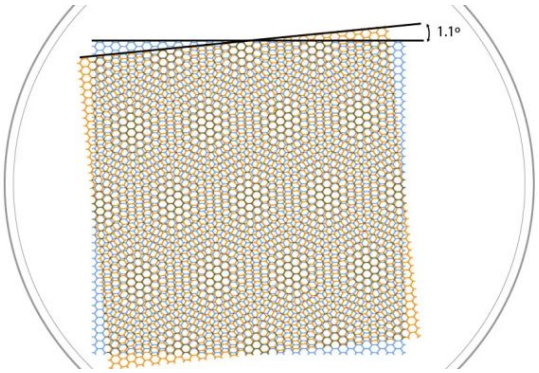

Illustration showing the two one-atom thick layers of graphene (in blue and orange), stacked one on top of the other and rotated between them by 1.1º.