

THE LARGEST EUROPEAN GATHERING OF EXPERTS IN THIS TOPIC

Whatever happened to graphene? The answer is in San Sebastian

More than 600 experts from 43 countries have gathered in San Sebastian this week to exchange ideas and share their work on this substance. Their ultimate goal: to take this material out of the laboratory to make the promised revolution a reality. This is the Graphene Week, which this year has received the visit of the 'father' of graphene, Andre Geim.

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San Sebastián has hosted the Graphene Week.

What is the matter with graphene? This has been a legitimate question since 2004, when researcher Andre Geim managed to isolate this two-dimensional material together with his colleague Konstantin Novoselov, an achievement that won them the [Nobel Prize in Physics in 2010](#). Since then, scientists, companies and media began selling **incredible properties** of a substance that had remained hidden in our pencils for centuries. Graphene was going to revolutionize **electronics**, **medicine** and end the shortage of **water** in the world.

Almost fifteen years after everything started, we are still waiting. The transforming power of science is measured in decades and even graphene is no exception. "More than thirty years passed between the discovery of germanium-silicon transistors and the moment they could be found

everywhere,” MIT researcher Pablo Jarillo Herrero, [a pioneer in the study of graphene](#) and one of the speakers at the congress, has explained to Sinc.

The complaint is common among those attending the [Graphene Week](#) held these days in San Sebastian (Basque Country). They feel that **excessively high expectations** have been generated around a ‘revolution’ that, although it may not seem so, and which, according to Jarillo, “advances at the usual pace”. That is why he asks for patience: “The discovery of graphene was a scientific revolution. It will be a **technological revolution**, but only thirty years from now will it be possible to appreciate it. For the time being, it is an evolution, because there is a lot of work to be done.”

“The discovery of graphene was a scientific revolution. It will be a technological revolution, but it will be appreciated only thirty years from now,” says Jarillo.

Geim, one of the ‘fathers’ of graphene, fully agrees. “If it were just a sheet of graphite with a thickness of 0.1 nanometres, no one would be at this conference.” There is still a lot of **basic research** to be done in order to tap the potential of this substance, which is already attracting the industry for more mundane applications such as conductive ink and helmet reinforcements.

Target: to reach the factory

Today, the problem of graphene continues to lie in its scalability: companies and universities struggle to obtain good quality material in **industrial quantities** - as well as to adapt existing devices to this material. In fact, this year's conference marks half of the path in the goal of taking graphene “from the laboratory to the factory.” This is the goal set by [Graphene Flagship](#), a huge European project that unites more than 150 researchers and companies and whose budget is 1,000 million Euros.

Meanwhile, the sector has continued to evolve. “It's called a graphene conference, but it's not longer just about graphene,” explains Geim. The Nobel Prize winner refers to that “dozen of new bio-dimensional materials”, like black phosphorus, with equally interesting possibilities. “They are the brothers and sisters of graphene, to the point that it has become a wild-card

word to refer to these materials."

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This year's Graphene Week has brought together **more than 600 experts from 43 countries** for a week to share the situation of what Geim calls "graphene 2.0". It is the largest annual conference of the Graphene Flagship.

From September 10th to 14th, attendees were able to attend speeches by Geim and Jarillo, and also by researchers such as [Clare Grey](#), of the University of Cambridge (United Kingdom), and [Harry Atwater](#), of the California Institute of Technology (USA).

The choice of venue is not coincidental, and not only because the Basque research centre [CIC nanoGUNE](#) is the co-organiser of these sessions. "The fact that this conference is held here means that there are very important parts of the science of bio-dimensional materials that are being carried out in Spain," says Jarillo.

Spain is a major player in the international graphene sector. [Graphenea](#), whose headquarters are located in the outskirts of San Sebastian, is one of the largest producers in the world. It is not for nothing that the Basque company has just opened a headquarters in Cambridge, Massachusetts (USA), close to the MIT in which Jarillo, who is Valencian, works as a researcher. The goal continues to be to transfer scientific ideas to the industry and turn the graphene revolution into a reality.

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