

November Science News Recap

ICFO's summary of news highlights of the scientific discoveries and stories from the month of November 2025.

December 03, 2025

November was packed with different scientific discoveries, results and findings that have sparked different stories to share. We've gathered the most important updates to keep you in the know. Whether you missed a few of them or just want a quick recap, our summary of November's top scientific news has you covered. Dive in and catch up on everything that happened this month.

News 1

Simpler, yet just as precise: the new spectromicroscopy technique proposed at ICFO

Materials do not interact with light in the same way across different frequencies. Understanding how light is absorbed, scattered, or emitted in each case is essential to uncovering a material's optical properties and exploiting them in areas such as optoelectronics or device engineering. However, the external components typically required to capture this spectral information add cost and complexity to experimental setups, limiting

their broader use.
Now, researchers at ICFO have proposed a new spectroscopic method that achieves spectral and spatial resolution comparable to other state-of-the-art approaches, without the need for such additional elements. The technique, described in ACS Nano, could bring high quality together with greater accessibility and simplicity to this kind of research.
Date: November 4, 2025
Topic: Spectroscopy
ICFO Researchers: Prof. ICREA Javier Garcia de Abajo and Cruz I. Velasco.
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News 2:
Bridging Brain Science and Clinical Care in the 4th BMPN Annual Meeting
On Tuesday 4th of November, the Barcelona Medical Photonics Network (BMPN) celebrated the fourth edition of its annual meeting. This year's edition was organized by and held at ICFO, where the speakers explained their experience in applying advanced optical technologies to address brain related scientific and clinical challenges. Overall, the 4th BMPN edition showed the importance of the interconnection between photonics and medical research, highlighting and placing a special interest in how optical tools can be harnessed for monitoring and unfolding hidden features of brain activity.
Date: November 7, 2025
Topic: Neuroscience
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News 3:
Three-node quantum networks are exceptionally resistant to photon loss
Most future quantum technologies, such as distributed quantum computing or sensing, involve more than two stations connected in a network configuration. Developing methods capable of certifying the presence of quantum correlations with no classical analogue under realistic experimental conditions beyond the two-party scenario is, therefore, crucial.
In a recent Physical Review Letters article, ICFO researchers have studied quantum networks with three nodes and have theoretically demonstrated that, by using a special type of entangled states (high-dimensional photonic states), one can certify wether the obtained correlations are purely quantum even when there is a high photon loss. They have closed the detection loophole as well, paving the way for further studies in fundamental science and future quantum technologies.
Date: November 13, 2025
Topic: Quantum Information Theory
ICFO researchers: Dr. Tamas Krivachy and Martin Kerschbaumer.
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News 4:

ICFO's Quantum technologies for Space showcased at Space Tech Expo in Bremen

ICFO has participated in the NewSpace Catalonia pavilion at Space Tech Expo in Bremen, Germany, a space organized by the Generalitat de Catalunya with support from the Institut d'Estudis Espacials de Catalunya (IEEC). Representatives from ICFO have presented the latest advancements in quantum technologies for space, including ultra-secure quantum communication systems for free-space networks as well as space-based missions.

Date: November 18, 2025

Topic: Quantum communications

ICFO experts: Adria Sansa, and Victor Herrero and Jordi Pinyol

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News 5:

Pioneering open library to identify biomolecules

Researchers at the Universitat Oberta de Catalunya (UOC) and ICFO have created a database that is accessible and open to the scientific community with the Raman spectra of 140 biomolecules, including the main types of nucleic acids, proteins, lipids and carbohydrates. The tool can help identify molecular composition based on its Raman spectrum in an objective, fast and standardized way. The results are published in Chemometrics and Intelligent Laboratory Systems.

Looking ahead, the researchers hope that the scientific community will contribute to expanding the database, so that it becomes a leading collaborative library. The aim is that as the database expands, it will boost the training of artificial intelligence models in the field of molecular analysis of biological samples. This will create opportunities for new applications in the diagnosis and monitoring of diseases.

Date: November 27, 2025

Topic: Biophysics

ICFO researchers: Jose Javier Ruiz and Dr. Pablo Loza-Alvarez.

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