September Science News Recap

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

October 13, 2025

September 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 September's top scientific news has you covered. Dive in and catch up on everything that happened this month.

News 1

Well-known semiconductor gains renewed interest for green hydrogen generation

Bismuth vanadate (BiVO4), a semiconductor material with several outstanding physical and chemical properties, was once seen as an ideal photoanode for hydrogen generation via sunlight-assisted photoelectrochemical water splitting. However, scientists soon realized that the electric current produced by this reaction -directly proportional to the amount of hydrogen generated- was insufficient to meet the worldwide demands for green energy.

Nevertheless, some institutes, including ICFO, have kept investigating ways of unlocking the full potential of BiVO4. In an ACS Energy Letters publication, ICFO researchers have now demonstrated a new route to exploit this material for hydrogen generation. By targeting lower solar energies, where light absorption was previously considered too weak to promote the water-splitting reaction, they have succeeded in generating and detecting photocurrents by increasing the optical path of the light inside the semiconductor material.
Date: September 3, 2025
Topic: Advanced Materials
ICFO researchers: Dr. Catarina G. Ferreira, Dr. Carles Ros, Dr. Mingyu Zhang, Valentina Gacha, Dr. Dimitros Raptis, led by ICFO and UPC Prof. Jordi Martorell.
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News 2:
Two ICFO early-career researchers awarded prestigious ERC Starting Grants to tackle big questions in science
ICFO researchers Prof. Nicoletta Liguori and Prof. Carmen Rubio-Verdu have each been awarded an individual ERC Starting Grant by the European Research Council for their cutting-edge research in photosynthesis processes and the physics of 2D materials, respectively.
The ERC Starting Grant is one of the most prestigious European grants for early-career researchers, granting each awardee a total of 1.5M?, plus up to 1M? in top-up funding for the purchase of equipment for 5 years. This allows each awardee to conduct an independent high-risk, high-gain project, driving scientific excellence and giving support to retain top researchers in Europe in order to foster innovation and knowledge advancement.
Date: September 4, 2025
Topic: Photosynthesis and 2D materials
ICFO researchers: Prof. Nicoletta Liguori and Prof. Carmen Rubio-Verdu.
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News 3:
Lock and stock: a new coating enables efficient CO2 conversion into useful chemicals
A promising path to mitigate and eventually revert greenhouse effects associated to carbon emissions and global warming is the capture and conversion of CO2 into useful products. In this way, we could both take advantage of the CO2 surplus and mitigate the greenhouse effect.
ICFO researchers have now designed a special coating for the electrodes used in the conversion of CO2 into ethylene, ethanol, and other compounds with industrial and

energy-related purposes. They designed a material that coats the electrode and maintains its effectiveness even under challenging acidic conditions, which are essential for preventing the spontaneous loss of CO2 into undesired products. The results have been reported in the Journal of American Chemical Society.
Date: September 9, 2025
Topic: CO2 mitigation
ICFO researchers: Dr. Barbara Polesso, Adrian Pinilla-Sanchez, Dr. Eman H. Ahmed, Dr. Ank Guha, Dr. Marinos Dimitropoulos, Blanca Belsa, Dr. Viktoria Golovanova, Dr. Lu Xia, Ranit Ram Dr. Sunil Kadam, Aparna M. Das, Dr. Junmei Chen, Dr. Johann Osmond, Adam Radek Martinez led by Prof. at ICFO F. Pelayo Garcia de Arquer.
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News 4:
Physicists demonstrate controlled expansion of quantum wavepacket in a levitated nanoparticle
Quantum mechanical effects, such as wave-particle duality, typically manifest themselves at the scale of photons, electrons and atoms. However, scientists are seeking ways to extend these counterintuitive phenomena to bigger systems, such as large molecules, nanoparticles and, ultimately, macroscopic objects.
In a Physical Review Letters article, researchers at ETH Zurich and ICFO have now proposed and implemented a technique to increase the distance over which the wave-like behavior of an optically levitated nanoparticle remains well-defined. This marks a step forward in bringing truly macroscopic objects to the quantum regime.
Date: September 25, 2025
Topic: Quantum science
ICFO researchers: Dr. Andreu Riera-Campeny and ICREA Prof. at ICFO Oriol Romero-Isart
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News 5:
Two decades of Quantum Science through the lens of a photonics institute
A new article in Revista Brasileira de Ensino de Fisica tells the story of ICFO in quantum science since its inception. It highlights the main achievements in quantum correlations and Bell inequalities, quantum communications and cryptography, quantum simulation, quantum sensing and metrology, and quantum materials, as well as their impact in the global quantum ecosystem.
Date: September 29, 2025
Topic: Quantum science
ICFO researchers: Laia Serradesanferm Cordoba and Dr. Robert Sewell.
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