Three Chinese researchers win 2026 Future Science Prize for breakthroughs in autophagy, mesoporous materials, and arithmetic geometry

The Innovation News Team*

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The landscape of global scientific innovation has increasingly shifted towards Mainland China, and this year's Future Science Prize serves as a striking testament to that evolution. On the morning of August 13, 2026, the Future Science Prize-frequently described as China's equivalent to the Nobel Prize-announced its 11th cohort of laureates in a joint press conference held simultaneously in Beijing and Hong Kong(Figure 1). Established by a coalition of prominent scientists and entrepreneurs, the award continues its mission to spotlight groundbreaking, original research originating from China.

This year, the prestigious awards, which carry a monetary reward of US$1 million per laureate, have been bestowed upon three extraordinary researchers who have dedicated their careers to the rigorous pursuit of fundamental science. Zhang Hong of the Institute of Biophysics, Chinese Academy of Sciences (CAS), receives the Life Science Prize; Zhao Dongyuan of Fudan University is awarded the Physical Science Prize; and Yuan Xinyi of Peking University (PKU) claims the Mathematics and Computer Science Prize.

The 2026 laureates collectively highlight a growing trend in the Chinese scientific ecosystem: a deliberate pivot away from metric-driven, incremental research in favor of deep, curiosity-driven inquiries that address the most profound mysteries of the natural and mathematical worlds.

ZHANG HONG: DECODING THE COMPLEXITIES OF CELLULAR RECYCLING

The Life Science Prize was awarded to Zhang Hong, born in 1969 in Anhui province, for his pioneering contributions to the understanding of autophagy-the critical process by which cells degrade and recycle their own components. After receiving his PhD from the Albert Einstein College of Medicine in the United States in 2001, Zhang returned to China to establish his laboratory at the CAS Institute of Biophysics, where he has since redefined our understanding of cellular homeostasis in multicellular organisms.

Autophagy, a concept first introduced by Christian de Duve in 1963, involves the formation of double-membrane vesicles called autophagosomes that envelop cellular waste-ranging from misfolded proteins and damaged organelles to invading pathogens-and transport them to lysosomes for degradation. While Yoshinori Ohsumi's Nobel Prize-winning work brilliantly elucidated the core autophagy genes (ATG genes) in single-celled yeast, Zhang realized that higher organisms possess a far more intricate regulatory network.

In a bold methodological leap, Zhang championed the use of the nematode Caenorhabditis elegans as a model organism to dissect this complexity. His landmark 2010 paper in Cell unveiled a novel set of autophagy genes

Figure 1. Scene of the 2026 Future Science Prize press conference Images provided by The Future Science Prize

unique to multicellular organisms, which he dubbed the EPG genes. This discovery shattered the prevailing assumption that yeast autophagy pathways were entirely sufficient to explain the process in animals.

Zhang's subsequent research mapped the convoluted molecular pathways characteristic of animal autophagy, revealing how these processes underpin organismal development, physiological homeostasis and disease pathology.

"These findings provide a crucial foundation for understanding how neurodegenerative diseases like Alzheimer's and Parkinson's, as well as various cancers, arise from autophagic dysfunction," Zhang noted during the press conference. " Looking ahead, we hope to develop targeted interventions to clear pathogenic protein aggregates in neurodegeneration and modulate autophagy in tumors. Of course, there is still a long road ahead."

Beyond his scientific discoveries, Zhang has emerged as a vocal and influential critic of modern scientific culture. encapsulating his philosophy of unalloyed scientific curiosity.

In a widely resonated essay published in The Intellectual, Zhang sharply criticized the "resource-heavy research" model that plagues much of global academia.

He warned against a culture where massive funding and oversized teams are used to farm publications in top-tier journals merely to secure administrative titles and further resources-a cycle that crowds out true "0 to 1" innovation. He champions flat laboratory hierarchies, hands-on mentorship, and judging scientists by their "scientific taste" rather than mere publication counts.

ZHAO DONGYUAN: REBUILDING ORDER IN THE MICROSCOPIC WORLD

The Physical Science Prize recognizes Zhao Dongyuan, a 1963 Shenyang native and Fudan University professor who earned his PhD from Jilin University in 1990. Zhao was honored for his trailblazing work in the synthesis, mechanistic understanding and industrial application of mesoporous materials-substances characterized by pores ranging from 2 to 50 nanometers in diameter.

Prior to the late 20th century, scientists could synthesize basic inorganic mesoporous materials, but achieving precise structural control at the mesoscopic scale-especially when attempting to incorporate organic, carbon and multicomponent functional systems-was considered an intractable challenge. It was akin to trying to enforce architectural order upon a chaotic microscopic landscape.

Zhao revolutionized the field by pioneering a novel synthetic approach based on molecular self-assembly. He created the globally recognized SBA and FDU series of ordered mesoporous materials, achieving unprecedented control over pore size, structure, composition and morphology. Crucially, Zhao's team conceptualized and executed an "organic- organic self-assembly" strategy, successfully generating highly ordered mesoporous polymers and carbon materials. This breakthrough effectively shattered the long-standing limitation that restricted mesoporous materials to inorganic systems.

Following this, his laboratory developed generalized synthetic platforms, such as evaporation-induced self-assembly, drawing various metal oxides and composite materials into the ordered assembly paradigm. Today, his methodologies are ubiquitous in materials science laboratories worldwide, heavily cited in elite journals like Science, Angewandte Chemie, JACS and Nature Reviews Materials.

The impact of Zhao's fundamental research has rapidly cascaded into profound industrial applications. His mesoporous catalysts are currently deployed in large-scale petrochemical facilities for heavy oil hydrotreating, dramatically improving both conversion rates and the quality of refined oil products. Concurrently, his mesoporous carbon materials have achieved mass production, serving as high- performance anode materials in modern batteries powering smartphones and commercial drones.

YUAN XINYI: FORGING CONNECTIONS IN THE SOLITUDE OF ARITHMETIC GEOMETRY

The Mathematics and Computer Science Prize was awarded to Yuan Xinyi, born in 1981 in Macheng, Hubei. A prodigious talent who completed his bachelor's degree at PKU before earning his PhD from Columbia University in 2008, Yuan is now a professor at the Beijing International Center for Mathematical Research (BICMR) at PKU.

Yuan is being celebrated for his foundational contributions to arithmetic geometry, a formidable discipline that employs the tools of algebraic geometry to resolve profound questions about integer and rational solutions to polynomial equations-a quest that traces its origins back to the ancient Greek mathematician Diophantus. The field is renowned for monumental modern triumphs, including Andrew Wiles's proof of Fermat's Last Theorem and Gerd Faltings's proof of the Mordell conjecture.

Yuan's crown jewel is the creation of the "arithmetic bigness" theory within the framework of Arakelov geometry. Building on the seminal work of Lucien Szpiro, Emmanuel Ullmo, and Shou-Wu Zhang on the equidistribution of small points, Yuan's theory provides an entirely new architectural framework for studying small points on algebraic varieties. It has swiftly become a foundational tool in both arithmetic geometry and arithmetic dynamical systems.

Leveraging this theory, Yuan successfully proved the uniform Bogomolov conjecture over global fields. He then collaborated with Yu Jiawei and Zhou Shengxuan to prove an effective, quantitative version of the uniform Mordell conjecture, originally proposed by Barry Mazur in the 1980s. While Dimitrov, Gao, Habegger, and Kühne established the qualitative truth of Mazur's conjecture in 2021, Yuan's work introduced a masterful geometric perspective that provided explicit quantitative estimates, marking a monumental leap in Diophantine geometry.

Beyond these achievements, Yuan has maintained a highly fruitful collaboration with Zhang Shouwu and Zhang Wei. Together, they generalized the Gross-Zagier formula and proved the averaged Colmez conjecture. These results serve as vital stepping stones toward unraveling some of mathematics' most stubborn mysteries, including special cases of the Birch and Swinnerton-Dyer conjecture and the André-Oort conjecture.

"The process of mathematical research is often accompanied by a psychological sense of solitude and frustration. Therefore, the encouragement and recognition from peers act as an essential driving force that keeps us moving forward. "

Speaking via video link at the press conference, Yuan reflected on his recent presentation at the July 2026 International Congress of Mathematicians (ICM). He presented his latest collaborative breakthrough: the fully quantified uniform Mordell conjecture. By calculating explicit bounds for the number of rational points on curves of genus greater than one, his work has permanently shifted the field from qualitative descriptions to precise, quantitative metrics.

Yuan is profoundly optimistic about the trajectory of mathematical research in China. He recently noted in an interview that the convergence of elite faculty and exceptional student talent is transforming the domestic landscape. He predicts that within the next decade, the caliber of PhD graduates from top Chinese institutions will rival those of the most elite universities in the United States, pointing to a "stair-step descent" of world-class mathematical talent rooting itself firmly in China.

As the Future Science Prize concludes its 11th year, the work of Zhang, Zhao and Yuan underscores a pivotal maturation in China's scientific endeavor. Moving beyond the rapid accumulation of papers, these laureates exemplify a dedication to profound, slow-burning and paradigm-shifting inquiries that promise to resonate across global science for decades to come.

DECLARATION OF INTERESTS

The author declares no conflict of interest.