



## Shenzhou XIV astronauts give first science lecture

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Chinese astronauts conducted an open science lecture on Wednesday afternoon from the orbiting Tiangong space station for students around the globe.

At the beginning of the educational activity, livestreamed worldwide by China Media Group, the astronauts of the Shenzhou XIV mission — Senior Colonel Chen Dong, Senior Colonel Liu Yang and Senior Colonel Cai Xuzhe — showed the audience the sleeping and living quarters and scientific apparatus inside the Wentian lab module, which became part of the Tiangong station in July.

The astronauts then carried out some experiments to show unique physical phenomena in micro-gravity inside the space station and explained these phenomena. They also demonstrated sampling procedures on stalks of rice and thale cress, a small flowering plant of the mustard family, that grow inside a scientific cabinet.

### Inside

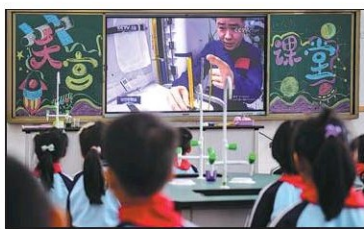
• Editorial page 9  
• See more page 5

During the 50-minute lecture, the crew members also answered questions from students that ranged from how to become an astronaut to what kinds of plants will be brought to space in future spaceflights.

As many as dozens of millions of primary and middle school students across China watched the televised event hosted by the China Manned Space Agency, the Ministry of Education and other government departments.

Nearly 400 invited students in Beijing, Heze, Shandong province, Zhengzhou, Henan province, and Dali, Yunnan province, were present at "ground class venues", according to the space agency.

The activity marked the third lecture of the Tiangong Class series, China's first extraterrestrial lecture series that aims to popularize space



Primary school students in Shenyang, Liaoning province, watch a livestreamed science lecture by Chinese astronauts aboard the orbiting Tiangong space station on Wednesday. ZHANG HONG / FOR CHINA DAILY

science. It was also the first time that the Shenzhou XIV mission crew gave a lecture.

Chen Zheng, an associate professor at Beijing Jiaotong University's School of Science who helped plan the Tiangong Class lectures, said physical experiments are most suitable for space-based science lectures because they are safer and easier to be done inside the spacecraft and the differences between those conducted in space and on Earth can be clearly and conveniently observed by students.

"By contrast, chemical or biological experiments are more prone to safety concerns and usually need more time. Besides, they are usually more sophisticated," he said.

Guo Lijun, a researcher at the Chinese Academy of Sciences' National Astronomical Observatories and one of the Tiangong Class planners, explained that the major objective of the lectures was to show the audience the physical laws in space and their differences from those on Earth.

## Sci-tech progress a defining feature of past decade

On June 16, 2012, China's Shenzhou IX spacecraft blasted off on a mission to dock with the orbiting Tiangong-1 experimental space lab. This was China's first manned rendezvous and docking mission. A decade later, on June 5, China successfully launched Shenzhou XIV, the first manned mission during the construction phase of China's first space station.

Astronautics is only one of the technological sectors in which China has made tremendous progress over the past 10 years. There is also the *Rainbow Fish* submersible that can dive to a depth of 11,000 meters; Micius, the world's first experimental quantum communication satellite; and the world's first quantum computer.

The country has also made great technological achievements in advanced materials, artificial intelligence, aviation, bio-tech and robotics.

There was a time when China was trying to catch up with the developed world in technology. Now, China can proudly say it has caught up with the old champions in quite a number of sectors thanks to a series of policies that have been devised and implemented to support the country's innovation drive. This has been backed by significant investment in R&D, which rose 14.2 percent year-on-year to reach 2.79 trillion yuan (\$441.66 billion) in 2021. This was 2.44 percent of its GDP, up from a 1.91 percent in 2012.

If there is a keyword for China's sci-tech progress over the past 10 years, it is innovation. On the global innovation index released by the World Intellectual Property Organization, China has advanced from being ranked 34th in 2012 to 12th in 2021.

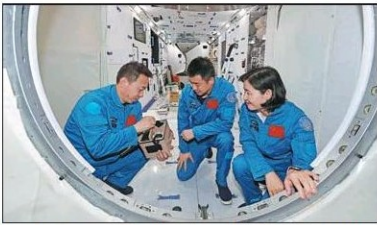
The country's push for innovation has been evident during the COVID-19 pandemic as it has used science-based methods to successfully isolate strains of the virus and develop testing reagents and vaccines against COVID-19, formulate tailored diagnosis and treatment plans, and used big data to trace infection chains, which has helped it build a solid sci-tech defensive wall to protect people's lives and health.

But much of the innovation over the decade has been incremental. Those are improvements in existing technologies that deliver a better performance. More needs to be done to produce new key technology and end the country's reliance on the developed countries for the most advanced technology.

The country needs to further promote scientific and technological innovation to upgrade its industries, eliminate the bottlenecks in supply, and realize high-quality development through innovation. That will be the key mission for the coming 10 years or more, as the country must strengthen its science and technology capabilities in order to achieve its development goals.

# 20<sup>th</sup> CPC NATIONAL CONGRESS

**Editor's note:** To mark the convening of the 20th National Congress of the Communist Party of China, China Daily has selected 10 sets of photo stories that illustrate various aspects of the country's development during the past decade. The photos, posters and videos showcase the achievements and experiences of the Party's cause, and the country under Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era. This is the first in the series.



**From left:** Astronauts Chen Dong (center), Liu Yang (right) and Cai Xuzhe train in the test module at the China Astronaut Training Center on April 29. Shenzhou X crew members (from left) Zhang Xiaoguang, Nie Haisheng and Wang Yaping leave the reentry capsule in Arnuulang Grassland in central Inner Mongolia autonomous region, on June 26, 2013, and salute the people after successfully completing their mission. Astronauts Nie (center), Liu Boming (right) and Yang Hongbo undertake extravehicular training on Sept 25, 2020. PHOTOS BY XU BU / FOR CHINA DAILY

## Aerospace industry promises future success



Chinese astronauts pose for a group photo at the Beijing Aerospace City on Jan 11, 2018.



Astronaut Jing Haipeng trains in a centrifuge on June 30, 2016.

Since the 18th National Congress of the Communist Party of China, the nation's aerospace industry has shown great confidence in its path, taking self-reliance in science and technology as the strategic support for the sector's development, and has achieved strong breakthroughs in key core technology fields. That has seen China's ambition of becoming a powerful aerospace nation move forward with great strides.

As a photographer of the manned space project, Xu Bu has participated in many such missions and witnessed the development of the country's aerospace science and technology sector over the past 10 years. From unmanned to manned, from single module to multimodule, from space laboratory to China's Tiangong space station, young sci-

ence and technology workers have grown into authoritative scientists, while some astronauts have honed themselves into sophisticated experts, who still take part in the construction of Tiangong, or Heavenly Palace, in their 50s.

Scientific researchers have utilized technology to create a brilliant history, and photographers have recorded brilliant moments. In the new era, they are all working hard to develop the aerospace industry and build a powerful aerospace nation.

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Online Watch the video by scanning the code.



Astronauts are fitted for spacesuits in the spacesuit workshop on March 23 last year.



**From left:** Astronauts Nie Haisheng (center), Liu Boming (right), and Tang Hongbo conduct water exit training on Sept 10, 2020. Astronauts conduct underwater training in a simulated weightless environment for space station missions on Nov 28, 2018.

