

How can the Chinese Space Station become a "Home in Space" for all Mankind?

East-West Dialogue - Sino-Foreign Dialogue

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On February 24, 2023 the exhibition "Dreaming of the World and Asking for the Vault of Heaven - 30 Years of Achievements in China's Human Spaceflight Technology" opened in Beijing. Year 2022 marked the thirtieth anniversary of the start of China's manned space program. In 2023, the Chinese space station was fully completed, and the "home in space" started its journey in space. The completion of China's space station as a national space laboratory will help open up a new avenue of space exploration for China and for all mankind.

What is the global significance of the completion of the Chinese space station? How can the space station become a "home in space" for all of humanity?

To clarify these issues, Yang Yuguang, Vice-Chairman of the IAF Committee on Space Transport, and Anu Ojha, Director of the British National Space Academy and Director of the British National Space Centre, were interviewed in the Chinese news agency's (CNS) "East-West Dialogue" forum.

Yang Yuguang believes the Chinese space station is a "national business card", and a very important platform for international co-operation. In the future, foreign astronauts could most likely visit the Chinese space station aboard the Shenzhou spacecraft, so space travel can become a place of common progress for all mankind.

Anu Ojha stressed that astronauts around the world agreed that the completion of the Chinese space station is an impressive achievement, and that the Chinese space station has great potential as an international scientific platform, believing that research will contribute to build a bridge to a better understanding of all humanity.



On November 30, 2022 at 7:33 p.m. Beijing time, the three astronauts from the Shenzhou-15 crew entered the space station and realized the first "space rendezvous" in the history of Chinese manned spaceflight with the Shenzhou-14 crew already waiting there . Photo by Wang Jiangbo

The following is an excerpt from the dialogue:

CNS: Since the launch of the Tianhe core module in April 2021, the Chinese space station has been completed on schedule through 11 space missions. How do you rate this achievement? What do foreign astronauts and scientists think about the completion of the Chinese space station?

Anu Ojha: Five years ago in Beijing, I learned about China's plans for the development of the space station, which was scheduled to be completed in 2022, at a presentation by the China Manned Space Engineering Office. Meanwhile China has implemented all plans as scheduled.

I know that astronauts around the world consider this an impressive feat, including European astronauts, the members of the Russian State Space Society and NASA astronauts, all looking to China's technological achievements and progress.

CNS: The construction of China's space station respected learned lessons from the world's development of space technology, what significance do you think the completion of the station will have?

Yang Yuguang: The "T" configuration of the Chinese space station's three modules weighs a total of more than 60 tons, much smaller than the 400-ton ISS, but its performance and functions have reached the standard of fourth-generation manned space stations. Both the energy supply and the communication options are at the top international level and in some aspects even better than for the ISS. For example, the Chinese space station uses advanced technologies such as triple-junction gallium arsenide batteries and its power supply capability is on par with that of the ISS.

The Chinese space station as a whole, in line with China's characteristic as an emerging country, is modest in size but has very advanced performance and functions. It is not only of great importance for China's human spaceflight, but also of great value for the development of China's high-tech sector.

CNS: What role can the Chinese space station play in international cooperation in space exploration and what are the possible partners?

Anu Ojha: The Chinese space station has great potential to become an international scientific platform. In 2016, China and the UN Office for Outer Space Affairs signed a cooperation agreement to create opportunities for countries not previously involved in orbital exploration. The ISS is a joint project of 16 countries and has already carried out numerous research projects with scientists from more than 100 countries since 2001. This shows that international platforms can indeed play a significant scientific role.

It is hoped that in the years to come, countries that are developing nascent space industries or have high priority on space development will participate. These countries have many promising talents and now have the opportunity to work with experienced Chinese and other international researchers to learn how to conduct experiments in the space environment, making new scientific discoveries that can then be shared with the international community.

CNS: What conditions must foreign astronauts meet in order to be stationed on the Chinese space station in the future? What kind of cooperation can be developed between Chinese and foreign astronauts? What is the special significance of working together and living in orbit?

Yang Yuguang: Foreign astronauts involved in scientific research activities on the China Space Station

should be very familiar with scientific experimental projects, and be able to carry out correct operations in Earth orbit, deal with extraordinary situations, and also participate in planning experiments or the development of experimental equipment to be involved, which are the most important requirements. In addition, both Chinese and foreign astronauts are required to participate in basic training programs, such as an intensive endurance training and a special field survival training.

Currently, all space station operating equipment is labeled in Chinese, so foreign astronauts may be required to learn Chinese, as is international practice. We look forward to foreign astronauts visiting the Chinese space station as soon as possible in the future.

CNS: Italian astronaut Samantha Cristoforretti caused a stir when she took to social media to describe the beauty of the universe in ancient Chinese while flying over China on the International Space Station. How interested are foreign astronauts in learning Chinese?

Anu Ojha: I spoke to astronaut Samantha Cristoforretti about the China-sponsored Sea Survival Training she and astronaut Matthias Maurer attended, which was so good that both are now fluent in Chinese.

I think it would be very interesting for the astronauts if they had the opportunity to take part in an international mission to the Chinese space station. Learning languages with the help of language courses is easily possible.

CNS: Mr. Ojha, you have already met the astronaut Wang Yaping in person. How do you rate the cooperation between Chinese and foreign astronauts?

Anu Ojha: I first met Wang Yaping after her first mission. During this mission, she taught more than 60 million Chinese students about space, showing the impact astronauts can have on the next generation to inspire them to science. She has now completed her second six-month space flight and is the first Chinese woman to have performed a spacewalk. As she returned to the capsule after her spacewalk, I saw the capsule's astronauts enthusiastically approach her to greet her.

This also happened to the Russian, American, European and Japanese astronauts who completed the spacewalk. Her reactions in a very difficult environment transcended all cultural differences. There are political differences between the countries, but practice shows that countries with different positions can find each other. I believe that science can be a powerful tool for space diplomacy, helping to build a bridge for a better understanding of all humankind.

CNS: The Chinese space station may also be upgraded to other configurations in the future. In your opinion, is there a possibility of technical cooperation between Chinese and foreign modules that carry not only experimental payloads? What difficulties must be overcome in order for a foreign spacecraft to visit the Chinese space station?

Yang Yuguang: I think this is a higher level of international cooperation. Joint experiments are already underway. It is very likely that foreign astronauts will visit the Chinese space station with the Shenzhou spacecraft in the future. Visiting foreign spaceships, such as cargo spaceships and manned spaceships, is the third level of cooperation. As the highest level of cooperation, the cooperation at the segment level must be built on the basis of the technical basis of the Third Level Cooperation.

It is crucial for foreign spacecraft to visit the Chinese space station that the docking systems of the two spacecraft are compatible and equipped with the appropriate measurement devices. This is a complex

technical process that takes time. However, it is technically conceivable that cabin parts for the space station will be manufactured abroad in the future.

CNS: Space is mankind's common home, but China has long been barred from participating in the International Space Station project, and some countries have internationally hyped the thesis of "China's threat in space." What do you think?

Anu Ojha: We are in a century of profound changes. Different countries see the performance of other countries with different eyes, but I believe countries can find common ground. Scientific collaboration for the benefit of all mankind is a very powerful unifying factor, not necessarily easy, but I don't think it's unattainable either.

CNS: What is the significance of the Chinese space station in international space cooperation for the various space nations? What are the benefits of manned deep space exploration?

Yang Yuguang: International cooperation is an essential element in becoming a space power. The Chinese space station is not only a national space laboratory and a "national business card", but also a very important platform for international cooperation. It offers more opportunities for other space nations to cooperate with China, and it should be emphasized that China has also created more opportunities for developing countries and aspiring space nations to engage in space and global space technology activities.



Sleeping area for astronauts inside the China Space Station (1:1). Model at the 14th China Airshow in Zhuhai, Guangdong, Nov. 6, 2022. (Photo by Chen Jimin, China News Service).

Reference [1] http://de.china-info24.com/static/content/germany/DasistChina/Gesellschaft/2023-03-04/1081689183192113152.html?fbclid=IwAR11Iz3mURtLgj17444OVpWaVY0-BLW8NUh1_AjFMwnoaxdngPMjgGOZY6A and China Rundschau KW 10, 2023