

CENTRE FOR JOINT WARFARE STUDIES



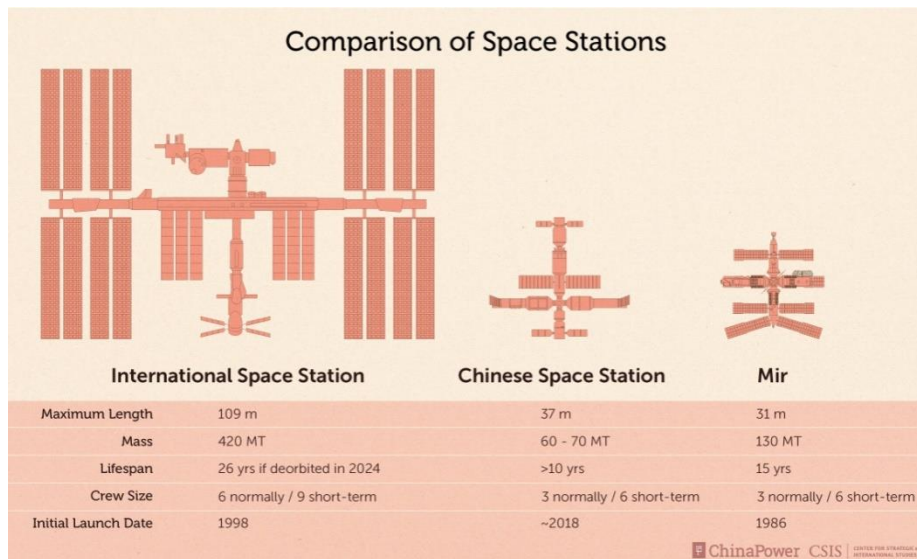
CENJOWS

CHINESE INNOVATION IN SPACE

1. **How China is Pushing Innovation in Space¹.** China became the first country in the world to send a quantum satellite, a new type of encrypted communications technology, into orbit. While it hasn't quite caught up to NASA yet, the Chinese space program is making steady progress. Some of the most exciting projects it is undertaking include manned trips to the Moon, an orbital space station, Mars rover landings, and even orbital solar panel fields that would beam renewable energy back to earth.
2. Following from the success of the *Tiangong* missions, it has been reported that China is now in the process of building the core CSS module. The module was originally planned for launch in 2018, but officials announced in March 2018 that the launch would be delayed until 2020. The Chinese station is expected to have a mass between 60 and 70 MT – this number may increase with vessels or additional modules docked – while the ISS has a mass over 420 MT, and Mir had a mass of approximately 130 MT.
3. The smaller size of the CSS may lend itself to operational efficiency and cost savings, but it comes with significant trade-offs. Reduced capacity for astronauts, equipment, and research may limit the utility of the station as a laboratory for scientific discovery. While Chinese engineers have noted that the station could be expanded via international cooperation, the CSS is designed to host three *taikonauts* (*Chinese name for Astronaut*) for 3 to 6-month intervals (or six-person crews for shorter periods).
4. Although more recently constructed than either Mir or the ISS, the CSS is expected have a shorter lifespan. Zhu Zongpeng, chief architect of China's space lab system, indicated in 2016 that the Chinese space station may stay in orbit for around ten years. Mir remained operational for 15 years before Russian controllers

¹<http://blog.tutorming.com/expats/chinese-space-program>

guided its descent into the South Pacific in 2001, and the ISS, which launched in 1998, will have functioned for 26 years if de-orbited as planned in 2024.²



5. **Future Projects.** China’s plan to launch space-based solar panel satellites which would beam solar power back to Earth. An article from the Ministry of Science and Technology suggests that the satellite would span one square kilometer, becoming by far the biggest man-made object in space – both physically and in terms of significance. Advocates of the program say the impact would be “the equivalent of an Apollo program for energy.” The proposed date of completion would be around 2050, so quite a distance in the future, but exciting enough to draw attention to China’s space program.

²https://chinapower.csis.org/wp-content/uploads/2017/07/Space_Station_Comparison.jpeg