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## China to Launch Spacelab Next Week -- "1st Step Toward Being the World's De Facto Space Station"

September 10, 2016



"The vast majority of space technology being developed is dual-use, and so serves Chinese security interests as well," says Johnson-Freese, an expert on the Chinese space program and a professor at the US Naval War College. "China understands the military advantages reaped by US space capabilities for many years, and wants those same capabilities".

China's second orbiting spacelab Tiangong-2 and its carrier rocket, Long March 2F, were transferred to the launch pad yesterday at the Jiuquan Satellite Launch Center. China will launch its second spacelab to test life support systems and refueling technology for its 60 ton modular space station. It will be visited in October by two astronauts aboard Shenzhou-11. The mission will bring China one step closer to the ultimate goal of its three-step human spaceflight program, a large, permanently inhabited space station.

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and is not guaranteed to operate beyond 2024. European space experts, traditional US space partners, are learning Chinese in anticipation of working with China if ISS is deorbited and the soon-to-be-launched Chinese station becomes the de facto international base, according to Johnson-Freese.



The core space station module, Tianhe-1, is due to be placed in orbit in 2018 by a heavy-lift Long March 5 rocket that will make its debut flight in November. Two more experiment modules – and a Hubble-class telescope that will dock with the station – will follow in the early 2020s. The space station will also be open to receiving science payloads, astronauts and even further modules from countries around the world, especially developing nations, under an agreement with the United Nations.

Tiangong-2 will orbit at 393 kilometers above the Earth, the same as that of the future space station, where astronauts will undertake

technical and repair-related experiments. It will carry space science projects for space biology, fluid physics in microgravity, fundamental physics, Earth science, space astronomy, and space environment. Wu Ji, director-general of the NSSC told gbtimes in February that Tiangong-2 will carry an ocean topography microwave altimeter.

“It can measure the topography of the oceans to a very high, precise accuracy, like a few centimeters, and which can be used for study of the Earth's gravity field, and also for El Niño, for example, or this kind of large-scale climate change issues.”

Another payload on Tiangong-2 is POLAR, a gamma-ray detector involving collaboration between China, Switzerland and Poland that will study one of the most energetic events in the universe – Gamma Ray Bursts (GRBs), which emit more energy in seconds than our sun does in billions of years.

Measuring the polarization of the GRBs can help eliminate causal mechanisms, with possibilities including massive stars collapsing into black holes and the merging of two neutron stars.

POLAR will observe 10 GRBs per year in a mission lifetime of at least two years, the minimum stated time that Tiangong-2 will be in orbit. Other instruments include an atomic clock using laser-cooled rubidium atoms, a Quantum Key Distribution (QKD) experiment and a Multi-angle Spectral Imager.

If all goes as planned, Tiangong-2 will be visited by China's first refueling and cargo vessel, Tianzhou-1 in the first half of next year, launched on a Long March 7 rocket from the new Wenchang spaceport.

And more, we might add.

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