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GERMAN SIMBOX ON CHINESE MISSION SHENZHOU-8: THE WORLD'S FIRST BILATERAL COOPERATION UTILIZING CHINA'S SHENZHOU PROGRAMME.

Abstract

On November 1, 2011, at 05:58 local time, the Chinese spaceship Shenzhou-8 was launched for a 17-day mission with a Long March rocket from the Jiuquan Satellite Launch Center in the Mongolia desert. On board was the German SIMBOX (Science in Microgravity Box) experimental facility containing 17 biomedical experiments, which were conducted by German researchers together with their Chinese colleagues. It was the first time that China cooperated with another nation in the scientific utilization of Shenzhou the core element of China's human spaceflight programme.The German Aerospace Center's (DLR) Space Administration was responsible for the entire Simbox hardware development and the project management of the German part of the mission on behalf of the Federal Ministry of Economics and Technology (BMWi). DLR's partner in this cooperation was the China Manned Space Engineering Office (CMSEO) which took charge of the accommodation of SIMBOX on Shenzhou-8 and the overall mission.

During the flight, plants, threadworms, snails, bacteria, and human cancer, thyroid and immune cells were exposed to the weightlessness and the cosmic radiation of space. Scientists used these special conditions prevailing in space as a tool to tackle fundamental biological and medical questions that also play an important role on the Earth. For example, researchers from the Universities of Erlangen and Wuhan performed joint studies on a mini ecosystem with snails and algae. The SIMBOX facility accommodated a total of 40 experimental units, each approximately the size of a smartphone and specifically designed according the requirements of the scientists. Some of the experimental units were placed in a centrifuge producing Earth-like gravity for reference purposes. In the evening of November 17, Shenzhou-8 landed on schedule in the Chinese part of the Gobi Desert in Inner Mongolia, completing a successful 17-day mission. Within a few hours SIMBOX was retrieved and transported back to Beijing where the specimens were handed over to the scientists for evaluation in their home laboratories.

The flight of Shenzhou-8 and the successful rendezvous and docking with Tiangong-1 represents a milestone in China's way towards an own space station, which is expected to be fully operational by 2020. SIMBOX on Shenzhou-8 has opened up a completely new partnership in human spaceflight for Germany and was a first step towards an international research in space utilizing China's manned space programme.