

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Governmental Human Spaceflight Programs (Overview) (1)

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BRIEF INTRODUCTION OF FACILITIES AND RESEARCH PLANNING OF CHINA SPACE
STATION

Abstract

China's Space Station (CSS) will be built up from 2020 and completed in 2022 or latter. The total weight of CSS is more than 66 tons. It composed of one core module and two experiment modules. The orbit attitude is 350-450km, predicted microgravity level can be achieved to 10⁻³ on average, payload support weight could be 17 tons with 12 kW power supply, crew number on board could be 3, no more than 6, and communication of downlink through relay satellite of 1.1 Gbps with 90A series of science projects will be carried out onboard CSS. Research areas of space sciences for CSS include life science and biotechnology, microgravity fluid physics and combustion science, material science, fundamental physics, space astronomy and astrophysics, space physics and space environment, earth science and application, and experiment of novel space technology. The number of experiment rack on CSS is scheduled to be 26, placed in pressure cabin, there will be 67 payload adaptor placed on exposed platform. The experiment racks could be divided by research area. Life ecological Rack, Biotechnology Rack and Scientific glovebox and freeze are designed for the research of Life Space life sciences and biotechnology; Fluid physics Rack, Two-phase system Rack and Combustion Rack are designed for Microgravity fluid physics and combustion research; High temperature materials science Rack and Containerless materials science Rack are for Material science study in space; Cold Atom Rack and High-precision Time-Frequency Rack will be used for Fundamental Physics study in Microgravity. Except for Specific fields, racks for multipurpose are also prepared, there will be High microgravity science Rack, Variable gravity experiment supporting Rack, Modularized Experiment Rack and Online Maintenance and operation Rack and Multipurpose experiment racks. In this paper, the parameters of each experiment rack and main capabilities will be introduced in detail, and main projects will also be present.