

NASA's Ground-Based Microgravity Simulation Facility

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Abstract

Since opportunities to conduct experiments in space are scarce, various microgravity simulators and analogs have been widely used in space biology ground studies. Even though microgravity simulators do not produce all of the biological effects observed in the true microgravity environment, they provide alternative test platforms that are effective, affordable, and readily available to facilitate microgravity research.

The Microgravity Simulation Support Facility (MSSF) at the National Aeronautics and Space Administration (NASA) John F. Kennedy Space Center (KSC) has been established for conducting short duration experiments, typically less than 1 month, utilizing a variety of microgravity simulation devices for research at different gravity levels. The simulators include, but are not limited to, 2D Clinostats, 3D Clinostats, Random Positioning Machines, and Rotating Wall Vessels.

In this presentation, we will provide an overview of current MSSF capabilities, research conducted in the MSSF, new technology developments, customized sample holder designs, and the physical characteristics of these microgravity simulators.