



# Zero Gravity Research Facility at NASA Glenn Research Center

The **Zero Gravity Research (Zero-G) Facility** is the largest facility of its kind in the world and continues to be the Nation's most modern research tool for exploring weightlessness, or microgravity, on Earth.

## Facility Description

The Zero-G is NASA's premier facility for conducting ground-based microgravity research. Operational since 1966, it is one of two drop towers located at the NASA Glenn Research Center. The facility is used by investigators from around the world to study the effects of microgravity on physical phenomena such as combustion, fluid physics, biotechnology, and materials science.

Microgravity, a condition of relative near weightlessness, can only be achieved on Earth by putting an object in a state of free fall.

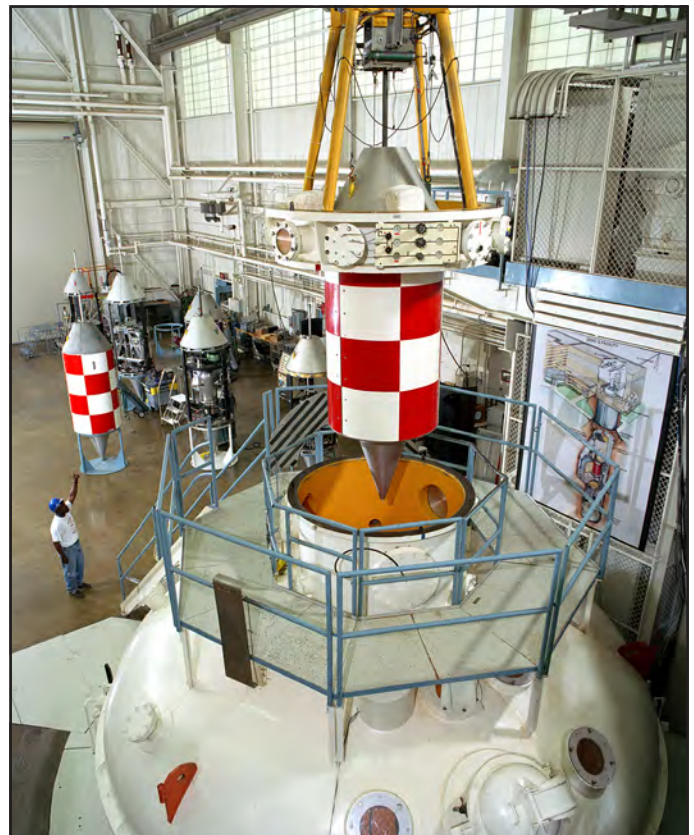
## Facility Benefits

- Experiments free fall 132 meters and are weightless for 5.18 sec during the fall
- The free fall is conducted inside a 143-m steel vacuum chamber
- Evacuating the chamber to a pressure of 0.01 torr reduces the acceleration, due to aerodynamic drag, on the freely falling experiment vehicle to less than 0.00001 g
- Allows experimenters to quickly perform microgravity research, test space experiment concepts, and develop space flight hardware at a small fraction of the cost of conducting these tests in space
- More than 4,000 tests have been conducted since 1966

## Commercial Applications

- Cryogenic storage
- Fundamental scientific studies of combustion, fluid physics, biotechnology, and materials science

- Feasibility of experiment concepts proposed for long-duration microgravity experiments
- Development and testing of International Space Station experiment hardware
- Deployment of hardware during free fall, in a vacuum environment



Positioning a drop vehicle on top of the vacuum chamber.

## Capabilities

Zero Gravity Research Facility	
Microgravity duration	5.18 sec
Free-fall distance	132 m
Gravitational acceleration	<0.00001 g
Mean deceleration	35 g
Peak deceleration	65 g
Vacuum level	0.01 torr
Vacuum chamber length	143 m
Vacuum chamber diameter	6 m
Drop vehicle capabilities	
Payload diameter	Up to 1 m
Payload height	Up to 1.6 m
Payload weight	Up to 455 kg

## Facility Testing Information

<http://facilities.grc.nasa.gov>

## Contact

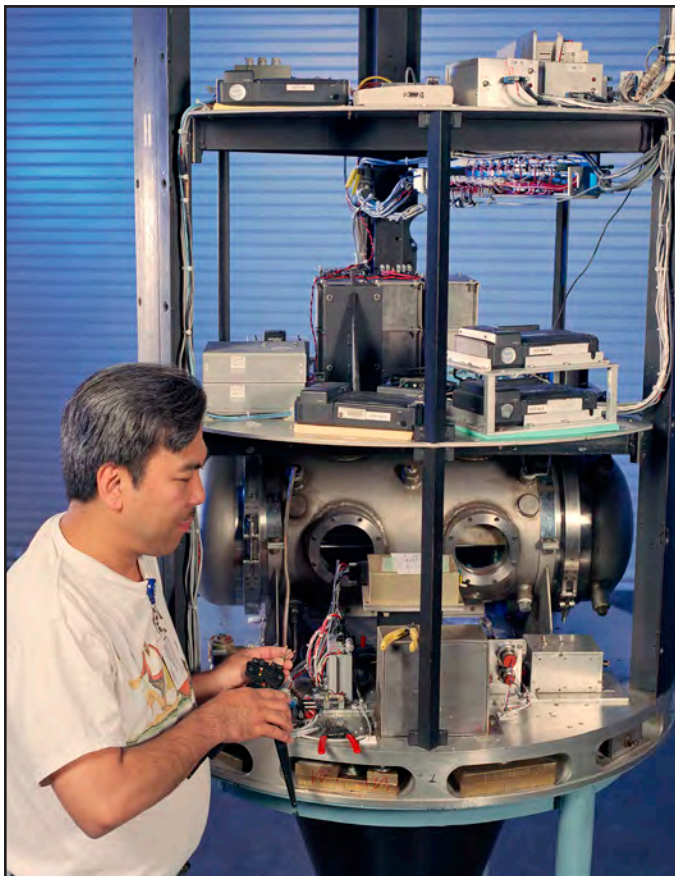
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An electronics technician makes adjustments to the experiment on the "H" drop vehicle at the Zero-G facility.



Retrieving the drop vehicle after a test in the Zero-G facility.