

IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Microgravity Sciences on board of Space stations (6)Author: Mr. Debarshi Mukherjee
IndiaRECENT ADVANCES IN MICROGRAVITY EXPERIMENTS: INSIGHTS FROM DIFFERENT
MICROGRAVITY PLATFORMS**Abstract**

Microgravity is a unique environment that provides researchers with the opportunity to study phenomena that cannot be observed on Earth due to the influence of gravity. In recent years, significant advances have been made in microgravity experiments using various platforms, such as drop towers, parabolic aircrafts, sounding rockets, and capsules. This paper highlights some of the recent results of microgravity experiments. One of the most significant advantages of the drop tower platform is its ability to provide researchers with a short-duration microgravity environment. Researchers in the field of material science have used drop towers to investigate the behavior of molten alloys, liquids, and polymers under microgravity conditions. Parabolic flights offer researchers the opportunity to conduct longer-duration microgravity experiments. In the field of life sciences, parabolic flights have been used to study the effects of microgravity on human physiology. Recently, researchers from France and Germany conducted a study to investigate the effects of short-duration microgravity on the human cardiovascular system. They found that exposure to microgravity led to a decrease in blood pressure and an increase in arterial stiffness, which could have implications for future space missions. Sounding rockets are another platform that offers researchers the opportunity to study microgravity over a longer duration than drop towers. In the field of astrophysics, sounding rockets have been used to study the formation of stars and galaxies. Recently, a team of researchers from the United States used a sounding rocket to study the formation of carbon molecules in the interstellar medium. They observed that the formation of carbon molecules in microgravity was more efficient than in gravity, which could have implications for our understanding of the chemistry of the universe. Finally, capsules offer the opportunity to conduct microgravity experiments over an extended duration. In the field of space science, capsules have been used to study the effects of long-term microgravity exposure on the human body. Recently, a team of researchers from the United States and Russia conducted a study to investigate the effects of long-term microgravity exposure on the human immune system. They found that exposure to microgravity led to a decrease in immune cell function, which could have implications for future space missions. These experiments have the potential to contribute significantly to our understanding of the universe, as well as to the development of technologies and therapies for space exploration and human health.