

IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)  
Life and Physical Sciences under reduced Gravity (7)

Author: Mrs. Astrid Juarez  
Universidad Nacional Autónoma de México (UNAM), Mexico, astridmichellesep@gmail.com

Mr. Jorge Andres Arvizu Melgar  
TECNOLOGICO DE MONTERREY, Mexico, jorge@arvizu.me

Ms. Guadalupe Estrella Salazar Calderón  
Mexico, estrellasalazar172@yahoo.com

Mr. Axel Ismael Trujillo Bautista  
Universidad Nacional Autónoma de México (UNAM), Mexico, Bautistaaxel504@gmail.com

Mrs. Ana Karen Ramirez  
Mexico, astrid@epicqueen.org

MICROGRAVITY AND ITS EFFECTS ON SLEEP AND PHYSICAL WELL-BEING ON LONG TERM  
SPACE MISSIONS

**Abstract**

The quality and consistency of sleep is crucial for both mental and physical well-being, and extended exposure to microgravity and other unique conditions of space travel can significantly disrupt normal sleep patterns. In order to grasp the full extent of the impact on astronauts, researchers have employed various techniques such as wearable sensors and cutting-edge technologies to monitor sleep in real-time. This project aims to provide an extensive examination of current sleep studies in space and pinpoint avenues for future investigation and growth.

The project will begin with an examination of the existing body of research, taking into account the various physiological and psychological factors that can influence sleep patterns during space travel, as well as the utilization of wearable sensors and advanced technologies to track sleep. The potential ramifications of sleep disturbances on cognitive abilities, physical health, and mission efficiency will also be considered, as well as the strategies employed by astronauts and mission control to mitigate these negative impacts.

In the following stage, the project will focus on identifying potential areas for future research and advancement. This includes investigating the use of innovative technologies for sleep monitoring such as brain imaging and non-invasive neurostimulation, and developing effective methods for enhancing sleep quality and promoting restful slumber in space. Additionally, the project will delve into the effects of extended space missions on sleep and the need for customized sleep interventions to guarantee mission success and astronaut health and wellbeing.

The final outcome of the project will be presented at the International Astronautical Congress (IAC), where the conclusions and proposals will be shared with the international community of experts, engineers, and policymakers in the space medicine field. The presentation will provide a comprehensive overview of the current state-of-the-art and future prospects for sleep research in space and highlight the significance of this area of study for maintaining astronaut health and well-being during space missions.

The project is expected to make a substantial contribution to the field of space medicine, informing and advancing future research and development efforts. By providing an in-depth analysis of the current status and future prospects for sleep studies in space, the project will improve our understanding of the effects of space travel on sleep and the techniques and technologies needed to support healthy sleep and successful missions.