

WIU CENTENNIAL HONORS COLLEGE
Thomas E. Helm Undergraduate Research Day 2023

Abstract

Poster

Major: Forensic Psychology

Faculty Mentor(s): Esteban Araya

Modeling Artificial Gravity for Space Exploration

Jacob Cook

In this in-course honors project, we explore the difficulties of space travel as it relates to gravity. Specifically, we review the concept of gravitational force, gravitational acceleration on various planetary bodies, the effect that micro-gravity environments have on astronauts' bone structures, the concept of centripetal acceleration and how it may be utilized to generate artificial gravity in spacecrafts. The Python based software Jupyter was used to program the equation of centripetal acceleration and two models were explored, one representing the International Space Station and the other representing a hypothetical space station. We found that in order for astronauts to experience the acceleration of gravity of 9.8 m/s^2 , the space station would have to revolve quickly and be multiple kilometers in length.