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## SHARING HERITAGE OF SLUGG ESA ACADEMY EXPERIMENTS PROJECT

**Abstract**

The "Solid Lubricants in microgravity from Gdańsk" (SLUGG) project, initiated by students of Gdansk University of Technology, delves into the intricate realm of friction within tribological systems under altered gravitational conditions. This endeavor is conducted as part of the ESA Academy's Experiments Programme, with experimentation facilitated on ZARM drop towers (both "classic" Bremen Drop Tower and novel GraviTower Bremen Pro). As an interdisciplinary venture, SLUGG merges engineering, physics, and space science, as well as management and human sciences, to explore fundamental aspects of friction crucial for space exploration and terrestrial applications alike.

This presentation aims to disseminate the invaluable insights garnered during the execution of the SLUGG project. Key emphasis will be placed on the significance of seamless cooperation and communication between project subsystems from its inception. Furthermore, the crucial role of strong risk management strategies, early testing protocols, and the importance of double-checking methodologies will be highlighted. By explaining these essential elements, the presentation aims to provide strategies leading to the successful implementation of complex scientific projects in space.

Cooperation and communication among subsystems from the project's onset have been instrumental in navigating the intricate challenges posed by microgravity experimentation. Risk management proved to be a very important aspect of student RD projects and enabled proactive identification and mitigation of potential setbacks, ensuring project continuity. Early testing initiatives have not only facilitated the refinement of experimental methodologies but have also provided invaluable insights into system behavior under microgravity conditions. Additionally, the emphasis on double-checking methodologies has fortified the reliability and accuracy of experimental outcomes, laying a robust foundation for subsequent analysis and interpretation - and we learnt it by hard, making some mistakes upon our journey to project completion. Importance of all of the above mentioned, can be proven by real life examples collected by the team of SLUGG project, during all phases of the ESA Academy Experiments project.

In summary, the entire path of the SLugG project underscores the paramount importance of collaboration, foresight and risk management, as well as meticulous attention to detail in the pursuit of scientific inquiry in space. Through the dissemination of our experiences and lessons learned, we aspire to catalyze future endeavors, fostering a community of researchers equipped with the knowledge and resilience necessary to navigate the challenges of space exploration. Join us as we embark on a voyage towards enhanced tribological understanding, forging new frontiers in space science and engineering.