

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Hands-on Space Education and Outreach (8)

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PROMOTION OF SPACE AND INTERDISCIPLINARY EDUCATION THROUGH A VENUS  
EXPLORATION BOARD GAME

## Abstract

Space exploration in popular culture has been heavily biased towards lunar or Mars exploration to reflect the activities of space agencies. Venus, however, has been largely forgotten in the public conversation. With the upcoming fleet of missions to Venus, there is a science communication opportunity for the space sector to reignite interest in Venus, promote space exploration, and share Venus' exciting history and future. This project proposes to publish a physical board game to promote and inspire the public to pursue STEM and multidisciplinary education in the context of Venus exploration for young adults, and balance between education and entertainment to maximize reach while avoiding heavy reliance on fiction.

Board games are an effective science communication tool for a public audience as they stimulate a variety of learning styles, provide multiple sensory inputs to reinforce concepts, and take advantage of trends in how learning preferences have changed. Their interactive and variable nature makes them engaging and replayable, allowing concepts to be revisited. Commercial space-themed board games have also focused heavily towards Mars (e.g. Terraforming Mars, Mars Horizon) and while some games are set on Venus (e.g. Onward to Venus, Cities of Venus), these games rely more heavily on fiction and prioritize entertainment over education. Space agencies have also built board games (e.g. NASA Space Voyagers: The Game), however these educational games focus on a narrower topic to teach a particular concept or skill.

The proposed game will challenge players to construct space missions to Venus to collect science data and develop technologies while balancing their resources, with the goal of being the first to construct a human settlement on Venus. Science, engineering, and human exploration concepts related to Venus exploration are presented through mission cards, with events that represent technical risks/opportunities. Political and managerial challenges to space exploration are also expressed through event cards which force players to make decisions that affect gameplay.

This product is under development with a goal to release a prototype online for free download to print and play. The International Space University's global network will be used to promote and distribute the game under a creative commons license and collect feedback from players via an online survey. This paper will outline the game development process used to translate space concepts into game mechanics, the resulting expression of science concepts through the gameplay, and next steps for distribution and feedback collection.