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ENGAGING THE FIVE SENSES IN SPACE THROUGH ARIZONA STATE UNIVERSITY'S INTERPLANETARY INITIATIVE

Abstract

Space needs to be taken out of the realm of the hero and into the realm of the common person. Space exploration seems so remote and advanced as to be inaccessible to most people, requiring "the right stuff" in order to be involved in many people's minds. The goal of the "Five Senses in Space" project through Arizona State University's (ASU) Interplanetary Initiative is to humanize and familiarize space by creating novel, multi-sensory experiences—particularly focusing on the senses not traditionally engaged by existing space outreach.

Our first Five Senses outreach project involved the creation of a lip balm encapsulating the "smell" of the center of our galaxy. A decade ago, the Spanish Institut de Radioastronomie Millimétrique telescope detected the presence of ethyl formate within the gas cloud Sagittarius B2, near the center of the Milky Way. Ethyl formate is the compound responsible for giving rum its scent and raspberries their flavor. Thus, our lip balm was created to give out a tangible item for sharing this information with the general public. The reaction has been enthusiastically positive, garnering coverage by news outlets such as Discover Magazine.

"Project Gastronaut," another project within the Five Senses, aims to improve the gustatory experience for astronauts—and eventually, tourists and the larger public—in space. Microgravity causes congestion due to poor sinus drainage, like a cold, it results in a dulled sense of taste. This, coupled with the fact that most space food options involve texture-lacking packets of freeze dried or rehydrated food, means that long-term space travel threatens to deprive humans of one of the most basic forms of daily pleasure. On extended journeys such as the 8-month one-way trip to Mars, food and the way we eat will play a critical role in health, morale, and crew community. For extended habitation of Mars and beyond, issues such as sustainable food packaging must also be addressed. Working with astronauts and combining expertise in food science and the physiological effects of extreme environments, we are developing ways to enhance the gustatory experience via: (1) engaging retronasal olfaction, (2) investigating texture simulation, and (3) changing how astronauts eat to improve flavor perception. This has practical applications here on Earth as well, as it can be used to help improve the experience of eating for people who have lost their sense of smell due to aging or neurodegenerative diseases.