THE OHIO STATE UNIVERSITY

Environmental Science Graduate Program Student Seminar Series

Air Quality in Spacecraft: What We Know About Aerosols in the International Space Station

Dr. Marit Meyer

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Abstract

The International Space Station (ISS) gives a 6-member astronaut crew the ability to live and work in low Earth orbit. It is a unique indoor environment, which has served as both home and workplace to over 230 people since the year 2000. In this low gravity environment, smoke does not rise and cookie crumbs do not settle the way they do on Earth, causing aerosols to behave differently and pose unique hazards for crew members. In its existence, virtually the same volume of ISS air has been continuously conditioned and 'revitalized,' including the removal of particles by filtration. While gaseous constituents of ISS air are monitored meticulously, the indoor aerosols have only recently been prioritized by NASA. The quantities and types of ISS airborne debris have been investigated in two Aerosol Sampling Experiments. Results of the particle collection and implications for the air quality in future spacecraft will be presented. Further characterization follows in the next experiments, which will take the first real-time aerosol measurements for ISS air quality with a reference-quality instrument, followed by miniaturized instruments. This talk will show the progression of the NASA 'technology roadmap' for aerosol monitoring in spacecraft.