Space Shuttle to deliver first UCLA-led experiment to International Space Station

February 25 2011

The International Space Station is set to receive its first UCLA-led research project when the Space Shuttle Discovery delivers a new payload of scientific experiments and supplies to the orbiting station. The Discovery launched Thursday, Feb. 24.

The project's series of experiments, which will look at the process of boiling under microgravity conditions, could lead to lighter, more compact cooling systems in space.

The project's principal investigator is Vijay K. Dhir, a professor of mechanical and aerospace engineering and dean of the UCLA Henry Samueli School of Engineering and Applied Science.

"As a researcher, I'm looking forward to seeing the results from our experiment, which we've worked on for many years." Dhir said. "But also, as someone who grew up during the space age, it's still awe-inspiring that humans can travel into space and work in orbit. The space program has brought many, many benefits to society. It's gratifying to be part of it and to conduct exciting research leading to the development of new technologies."

More than 600 experiments have been conducted on the space station since it first opened in November 2000. This will be the first UCLA-led experiment aboard the facility, according to NASA.

The main objective of the proposed series of experiments is to develop a

basic understanding of the heat-transfer and vapor-removal processes that take place during boiling under microgravity conditions in space.

Boiling is often thought of as a way to heat something up, such as a pot of water. But boiling can also be used to keep things relatively cool, since the bubbles that form on the hot object's surface transfer heat away from it when they leave into the liquid. This prevents the object from continuing to increase its temperature. This type of bubble boiling is known as nucleate boiling, and it is commonly used in cooling systems for power plants, electronics and in many other applications.

Boiling as a mode of heat transfer would be very advantageous in space because cooling systems utilizing the process would take up much less room and weigh much less than currently used systems.

This series of experiments aboard the space station would provide experimental data to validate predictions from numerical models. The data will also help establish how bubble growth and size correlate with gravity levels. In the extremely low gravity of space, bubbles are expected to grow to much larger sizes before they leave a hot object's surface than they do on Earth.

Dhir had led previous boiling experiments that were flown aboard NASA's KC-135 airplane, also known as a "vomit comet," which simulates weightlessness for about 20 seconds during the downward part of a steep parabolic flight path.

The current project's co-investigators are Gopinath R. Warrier, a research engineer at UCLA, and David F. Chao of the Glenn Research Center in Cleveland, Ohio.

More information: More information on the experiment is available from NASA on its International Space Station experiments page:

www.nasa.gov/mission_pages/sta … iments/BXF-NPBX.html

Provided by University of California - Los Angeles