

Alfred University professor Sundaram to sit on panel reviewing NASA project

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S.K. Sundaram

ALFRED, NY – S.K. Sundaram, Inamori Professor of Materials Science and Engineering at Alfred University, has been chosen to sit on a panel reviewing a NASA project to develop a system for replenishing oxygen supplies for astronauts.

NASA invited Sundaram, as a “glass/ceramics subject matter expert,” to sit on an external panel reviewing NASA’s electrochemical oxygen generator and compressor (eCOG-c) project. This project is outlined in a paper written by NASA scientist John Graf, Ph.D., a NASA scientist and project manager, titled “Mapping the Capabilities and Attributes of Solid Oxide Electrochemical Systems of Human Space Flight Needs.”

Sundaram is one of three outside subject experts joining three NASA representatives sitting on the panel reviewing the project outlined in Graf’s paper. He was invited to participate in the review as an expert in ceramic and glass science.

In the paper’s introduction, Graf describes a proposed system that can extract oxygen from a process stream of spacecraft cabin air and compress it without the use of mechanical compressors. “The goal of the project is to develop a solid oxide electrochemical oxygen separation and compression system to supply high-purity oxygen to recharge spacesuit oxygen tanks of astronauts on mission,” Sundaram explained.

According to the paper, the eCOG-c system “capable of producing high pressure, high purity oxygen may have application as a method of recharging space suit oxygen tanks during human exploration missions.”

The system, Sundaram explained, consists of thin ceramic layers sealed by glass material, through which water converted to steam passes. By applying a voltage, the water molecules are electrochemically split into hydrogen and high-purity oxygen, with the latter supplied to holding tanks for use by astronauts.

Sundaram said the panel review is scheduled for March 16-17 in Washington, D.C.

“They (NASA) want us to look at the design and the data and advise them about the design and processes for this application,” he said. “The panel will hear details of the project, brainstorm two full days, and present their findings, including potential problems in the design.”

Sundaram was appointed Inamori Professor of Materials Science and Engineering at Alfred University in 2011. Prior to coming to Alfred, he spent 16 years at the Pacific Northwest National Laboratory (PNNL), from 1994-2010. He joined PNNL in 1994 as a post-doctoral fellow and was appointed Senior Research Scientist in 1996. He became Chief Materials Scientist in January 2002. He earned his PhD from the Georgia Institute of Technology in Atlanta in 1994.