IOWA STATE UNIVERSITY
Center for Nondestructive Evaluation

CNDE Webinar Presentation
October 19, 2023 - 10:00 a.m. CST

This webinar will be recorded and made available on the CNDE website

NASA'S EMERGING NEEDS IN NDE FOR SPACE EXPLORATION

Presented by: K. Elliott Cramer
NASA Langley Research Center
Hampton, VA 23681

Abstract:
NASA's rich history of human spaceflight provides the foundation for today's exploration vision: to maintain U.S. leadership in space, establish a lasting presence on and around the Moon, and pave the way forward to Mars and beyond. This strategy begins with Artemis, a series of missions that will return humans to the surface of the moon for the first time in nearly 50 years. NASA's 2022 Strategic Plan makes the following observation: "Establishing a long-term human presence at the Moon and conducting the first human mission to the surface of Mars will be among the most challenging technical enterprises in human history. This era of human exploration will require innovative technologies and systems—some of which have not yet been demonstrated—to explore new and more challenging locations, like the lunar South Pole. Developing these capabilities will spur advancements in critical fields like medicine, energy, materials science, manufacturing, and climate sciences." Advanced materials, structures and manufacturing techniques will be the foundation of long-duration habitats on and around the moon as well as lunar and deep-space exploration vehicles. To perform in the harsh environment of space, these habitats and vehicles require equally advanced NDE and SHM techniques that can ensure they are both manufactured properly and are able to fully accomplish their mission. This presentation will discuss some of the needs for advanced NDE and SHM technologies as NASA pursues its vision for the human exploration of space, along with some examples how these needs have been addressed in the past.

Speaker:

Mr. K. Elliott Cramer is the NASA Engineering and Safety Center (NESC) Chief Engineer at the Langley Research Center (LaRC). Prior to this position Mr. Cramer served as the Associate Director and then Acting Deputy Director for Structures & Materials in the Research Directorate at NASA LaRC, where he led a team of 165 civil servants in 6 research branches developing safe, reliable, lightweight aerospace structures to meet NASA mission needs. Before his directorate role, Mr. Cramer was the head of the Nondestructive Evaluation Sciences Branch at LaRC, managing a team of civil servants developing novel methods for automated and large area inspection, modeling and data analysis tools, material state awareness technologies, and intelligent measurement and sensor systems. During his career Mr. Cramer has also completed Headquarters detail assignments in the Office of the Chief Engineer and the Office of the NASA Administrator. Mr. Cramer began his career as an Aerospace Technologist at LaRC in 1989 with the Nondestructive Evaluation Sciences Branch where his research focused on developing novel nondestructive inspection techniques for a variety of NASA applications including the Space Shuttle, the International Space Station, the X-37, as well as numerous aeronautics projects.

Mr. Cramer holds 15 U.S. patents on various inventions, including NASA's Ultrasonic Wire Crimp Inspection Technology, winner of the 2009 NASA Government Invention of the Year Award. He is a recipient of numerous awards throughout his career including a NASA's Exceptional Engineering Achievement Medal, a NASA Space Flight Awareness (Silver Snoopy) Award, an Outstanding Leadership Medal, and an R&D 100 Award.

Mr. Cramer has authored more than 85 technical reports and publications. Mr. Cramer hold a B.S. in Physics from Indiana University of Pennsylvania and an M.S. in Applied Science from the College of William and Mary.

To view live:
Please click this URL to start or join. Participant ID: Shown after joining the meeting:
https://iastate.zoom.us/j/91955478862?pwd=S1d5eDJ6bmlTZTRXZVdhOGc2dmFvQT09
International numbers available: https://iastate.zoom.us/u/abQk8iN1D
A copy of the recorded webinar will be posted at: https://www.cnde.iastate.edu/