

## Alfred University researchers receive grant to explore additive manufacturing for advanced ceramic materials

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S.K. Sundaram

Alfred University researchers in the Inamori School of Engineering will receive funding through the U.S. Department of Energy's Nuclear Energy University Program to explore additive manufacturing of ceramic materials for nuclear applications.

The \$509,850 one-year grant will allow the University to acquire a lithography-based ceramic manufacturing system (LCM), which will be coupled with the extensive 3D printing capabilities at Alfred University. The goal will be to establish processes for additive manufacturing (3-D printing) of ceramic materials, including designing and printing of oxides, carbides and nitrides for nuclear applications such as waste immobilization, fuel, and structural appliances.

Dr. S.K Sundaram, Inamori Professor of Materials Science and Engineering, is the principal investigator. Other members of the team include Dr. Matthew Hall, associate professor of biomedical materials engineering, and Dr. William Carty, professor of ceramic engineering.

Sundaram explained the University also has extensive experience and expertise in cutting-edge research on ceramics, colloids/powder processing, sintering, and ceramic manufacturing.

The proposed capability can be used for processing many different ceramic materials additively for a variety of applications relevant to nuclear industries, including single and mixed-oxide fuels and silicon carbide and carbon composites.

“Novel ceramic materials and components can be processed at higher throughput with minimal exposure to handlers and health risk” with the new system, Sundaram said. The new system will complement AU's Center for Advanced Ceramic Manufacturing Education (CACME). It will also be used for teaching engineering students about the current trends in additive manufacturing and for research by graduate students and faculty at Alfred University.

