

UW-River Falls alum honored with Presidential Early Career Award for Scientists and Engineers

February 13, 2017--University of Wisconsin-River Falls alumnus Alan Kruiuzenga has been named a recipient of a Presidential Early Career Award for Scientists and Engineers (PECASE). Former President Obama named 102 scientists and researchers as recipients of the award last month, the highest honor bestowed by the United States Government on science and engineering professionals in the early stages of their independent research careers.

Kruiuzenga, '05, is a principal member of the technical staff at Sandia National Laboratories - California, where he leads work investigating materials compatibility, materials selection, and efficiency-generating technology for solar power systems and advanced reactor concepts. He was nominated for the award for providing valuable fundamental understanding of corrosion mechanisms, and associated pioneering data, and for design and implementation of molten salt and liquid metal-based materials in high-temperature solar thermal and nuclear systems.

Kruiuzenga was a critical member of a SunShot research team focused on investigating liquid metals for use in Dish Stirling thermal solar systems. A major hurdle to energy efficiency enhancement in Dish Stirling systems is addressing high temperature materials corrosion from liquid metals. His work focused on developing an understanding of liquid metals to determine appropriate techniques to assess corrosion and assist in materials selection for such systems. Kruiuzenga sought to understand the complex compatibility behavior of liquid metals in latent heat energy storage applications. Adding to this challenge was a very limited set of existing thermodynamic data, and generally limited knowledge about the practical behavior of these materials in thermal solar systems. He leveraged both computational modeling and rapid screening methodologies to provide valuable fundamental understanding of corrosion mechanisms, leading to pioneering data for design and implementation of liquid metal-based materials in high temperature solar thermal and nuclear systems. Ultimately, Kruiuzenga successfully identified a corrosion-resistant coating ($MgAl_2O_4$) for use in liquid metal thermal energy storage systems operating at temperatures above $825^{\circ}C$, that also met the affordability targets for renewable energy systems.

Ranga Pitchumani, former chief scientist with the Department of Energy SunShot Initiative, nominated Kruiuzenga for the award. In his nomination, Pitchumani said "Alan is off to an impressive start in his career. Dr. Kruiuzenga's research directly contributes to the U.S. Department of Energy's SunShot mission of reducing the costs of solar-

generated electricity to be competitive, without subsidies, with conventional energy sources on the national electricity grid.”

“I am honored and thrilled to have won a PECASE award,” said Kruiuzenga. “Foremost, I believe this validates the important work that is being done on energy efficiency at Sandia, and in the United States. Providing long-lasting, efficient, and clean energy is one of the greatest challenges our generation faces, and I am proud to be able to advance this work by researching and recommending the materials that will be a key element of these systems as they enter pilot, and ultimately the market, over the years to come.”

Kruiuzenga earned a bachelor's degree in physics from UW-River Falls, before completing his master's degree in mechanical engineering and his masters and Ph.D. in nuclear engineering and engineering physics at UW-Madison.

“I'm indebted to the key individuals who supported me as a first generation college student at the University of Wisconsin-River Falls, especially Professors Lowell McCann and James Madsen,” Kruiuzenga said.

According to White House administration, “the Presidential Early Career Awards highlight the key role that the Administration places in encouraging and accelerating American innovation to grow our economy and tackle our greatest challenges.” This year’s recipients are employed or funded by 13 different entities, including the Department of Energy, National Aeronautics and Space Administration, and Department of Defense. These departments and agencies join together annually to nominate the most meritorious scientists and engineers whose early accomplishments show the greatest promise for assuring America’s preeminence in science and engineering and contributing to the awarding agencies' missions.

The awards were established by President Clinton in 1996 and are coordinated by the Office of Science and Technology Policy within the Executive Office of the President.

###