## Developing the Next Generation of Scientific Talent:

# KATLYN TURNER

Katlyn Turner had other options for undergraduate studies but chose to stay close to home and attend the University of Notre Dame where her mother worked. A talented piano player, she had a strong interest in music but decided to study chemical engineering in order to be sure she could find a good job. During her time at Notre Dame, she worked as a babysitter to help pay her college fees and in the process got to know Notre Dame Professor Peter Burns. Burns had received an Energy Frontier Research Center (EFRC) award, Materials Science of Actinides (MSA), from the U.S. Department of Energy's Office of Science to explore fundamental issues in nuclear energy. Burns asked Katlyn if she would be interested in stopping by his laboratory to learn about his project. She was indeed interested, so he asked if she would like to work on that project in his laboratory. She had never considered a career as a research scientist, but she accepted his offer and became a research assistant during school terms and over the summers. Over the course of her undergraduate career, she blossomed into a promising researcher. Burns notes that she was trusted to undertake procedures normally reserved for graduate students.

Her research focused on uranium peroxide clusters—nano-sized particles that Burns had discovered. These clusters came in a wide variety of shapes and sizes and were thought to be potentially important to the behavior of spent nuclear fuel and nuclear waste. As she neared graduation, Katlyn was asked to give a presentation on her work at a scientific conference, where Professor Rodney Ewing—a co-principal investigator on the MSA EFRC—heard her talk and was impressed with her work, her poise, her scientific maturity, and her communication skills. He invited her to join his research group at the University of Michigan, where he was studying the incorporation of uranium and other actinides into crystalline materials for waste disposal, as well as the effects of radiation on such materials.

*Top:* Katlyn Turner as a graduate student at the University of Michigan *(R. Ewing)*

*Middle:* Turner giving a seminar on international nuclear energy policy at Harvard University s Belfer Center for Science and International Affairs *(Harvard University)*

*Bottom:* Turner receiving her PhD hood at Stanford University commencement in 2017 with assistance from Professor Rodney Ewing

*Next page:* Turner receiving her EFRC 10@10 award in July 2019 *(U.S. Department of Energy Office of Science)*


*"I was impressed by Katlyn's poise, her scientific maturity, and her communication skills—especially for an undergraduate—and on the spot invited her to join my research group."*

*— Rodney Ewing, Stanford University*

## Professional Affiliations

- University of Notre Dame
- University of Michigan
- Stanford University
- Harvard University
  Belfer Center for Science & Int'l Affairs

Within a year, Ewing moved to Stanford and took Katlyn and others of his research team with him. Katlyn broadened the team's research strategy through her knowledge of uranium clusters as well as the study of both the clusters and ceramic materials of interest for nuclear waste storage under very high pressures—a process using diamond anvils. In effect, she used high pressure as a probe to understand both types of materials. In addition to her work at Stanford, she traveled back and forth between Argonne National Laboratory and Notre Dame to use analytic tools available there. She completed her doctorate, publishing her research in major journals.

Along the way, Katlyn also became interested in international science policy issues. While she was serving as a teaching assistant to Ewing, she helped with a high-profile course on the Fukushima nuclear disaster in Japan and related issues in international nuclear waste management. Her participation in this course turned out to be substantial, which enhanced her interest in policy and led to a post-doctoral appointment at Harvard's Belfer Center for Science and International Affairs. She has subsequently written several publications on science policy.

Katlyn credits the MSA EFRC with providing both support and a unique opportunity to conduct important basic research related to nuclear energy, both as an undergraduate and a graduate student. In addition, it showed her what is possible in the larger-scale collaborative research that EFRCs make possible. She also credits support from Stanford fellowships. The result is still something of a rarity—a young minority woman who is both a first-class research scientist and an exceptionally knowledgeable science policy analyst.

**Materials Science of Actinides (MSA)**
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