

## Faculty honored as inventors for advancing materials science

Two faculty members of the School of Engineering and Applied Science have been elected fellows of the National Academy of Inventors.

[Ilhan Aksay](#), a professor of chemical and biological engineering, and [Emily Carter](#), the Gerhard R. Andlinger Professor in Energy and the Environment and founding director of the University's Andlinger Center in Energy and the Environment, were among the 170 fellows named in 2015.

Aksay's research has focused on materials processing, particularly that involving complex fluids. His work embraces a wide range of topics from ceramics to self-assembled and self-healing materials. Early work on colloidal techniques led to the development high-temperature superconducting materials. Along with his colleague, Robert Prud'homme, a professor of chemical and biological engineering, Aksay developed a [process](#) that uses the thermal expansion of graphene oxide to produce graphene on an industrial scale.

Graphene, an atom-thick form of carbon, has unique properties, such as high electrical conductivity and extreme strength, that have made it valued in research and industrial development. Aksay, who co-founded Vorbeck Materials to further develop graphene technology, holds more than 50 patents. He received his doctorate from the University of California, Berkeley, in 1973 and joined the Princeton faculty in 1992. A member of the National Academy of Engineering, Science Academy (Turkey), and the American Association for the Advancement of Science, Aksay is a recipient of Turkish National Medal of Science and the Charles M.A. Stine Award from the American Institute of Chemical Engineers.

Carter, a professor of mechanical and aerospace engineering and applied and computational mathematics, is a leader in developing methods that use quantum mechanics to better understand and design materials. Her work, combining applied mathematics and theoretical chemistry, has used fundamental science to create innovative applications in the areas of materials science and energy efficiency.

In one [effort](#), Carter led a research team that advanced understanding of an 80-year-old problem in quantum physics allowing scientists to perform computer simulations of materials. The technique is 100,000 times faster than previous methods and greatly expanded the number of materials that can be simulated.

In addition to directing the Andlinger Center, Carter has focused her research in recent years on improving energy technologies such as converting sunlight to electricity and fuels. Her work has also aimed at achieving clean combustion of renewable fuels.

Carter received her doctorate in chemistry from the California Institute of Technology and was a faculty member at the University of California Los Angeles before coming to Princeton in 2004. She is a member of the National Academy of Sciences and the American Academy of Arts and Sciences. Among other honors, her work has been recognized by the American Chemical Society, the American Vacuum Society, the American Physical Society, the American Association for the Advancement of Science and the International Academy of Quantum Molecular Science.

The National Academy of Inventors is an organization made up of U.S. and international universities, government labs and non-profit research institutes. It was founded in 2010 to recognize holders of U.S. patents and honor innovation in scientific research. The new fellows will be inducted at a ceremony on March 20, 2015, at the California Institute of Technology in Pasadena.