

EUREKA

# An Institution of Inventors

With the election of Dereje Agonafer to the National Academy of Inventors (NAI), UTA now has 12 NAI fellows, the highest number of any university in Texas and the eighth-most in the country.

“Dereje Agonafer is a passionate contributor and dedicated teacher in his field who has been at the forefront of new technologies around thermal engineering,

many of which are now routinely practiced in the industry, reducing product development lead times and costs,” says Chandrakant Patel, chief engineer of HP Inc. and HP senior fellow. “He also excels at developing strong industry-university partnerships that create not only job opportunities for his students, but also a steady pipeline of practitioners in this important area.”

Dr. Agonafer, the Jenkins Garrett Professor in the Mechanical and Aerospace Engineering Department, has previously received all the flagship awards for significant contributions in thermal and thermomechanical management of electronics: a THERMI Award in 2008, an InterPACK Excellence Award in 2009, and the I THERM Achievement Award in 2014. His recent research has turned to cooling 3-D packaging.

Since the invention of the integrated circuit, efforts to increase the number of transistors on a silicon chip has fueled a

trillion-dollar business that forms the basis of micro- and power-electronics systems. Stacking chips or 3-D packaging offers new possibilities for heterogeneous integration of devices such as high-power memory and logic in distinct technology nodes. Agonafer’s research and more recent patents are essential to providing cost-effective, robust cooling of such packages.

“My research is a novel approach to cooling 3-D packaging, the process of packaging integrated circuits by stacking silicon dice and interconnecting them and thus building up in 3-D rather than out,” he explains. “We have developed a multidimensional heat transfer system that is capable of sub-ambient heat transfer while minimizing the room required for cooling these stacks. This research will help address the cooling challenge for high-power chip stacking, which is projected to be a multibillion-dollar business.”

Election as an NAI fellow is a high honor bestowed upon academic innovators and inventors who have demonstrated a “prolific spirit of innovation in creating or facilitating outstanding inventions and innovations that have made a tangible impact on quality of life, economic development, and the welfare of society.”



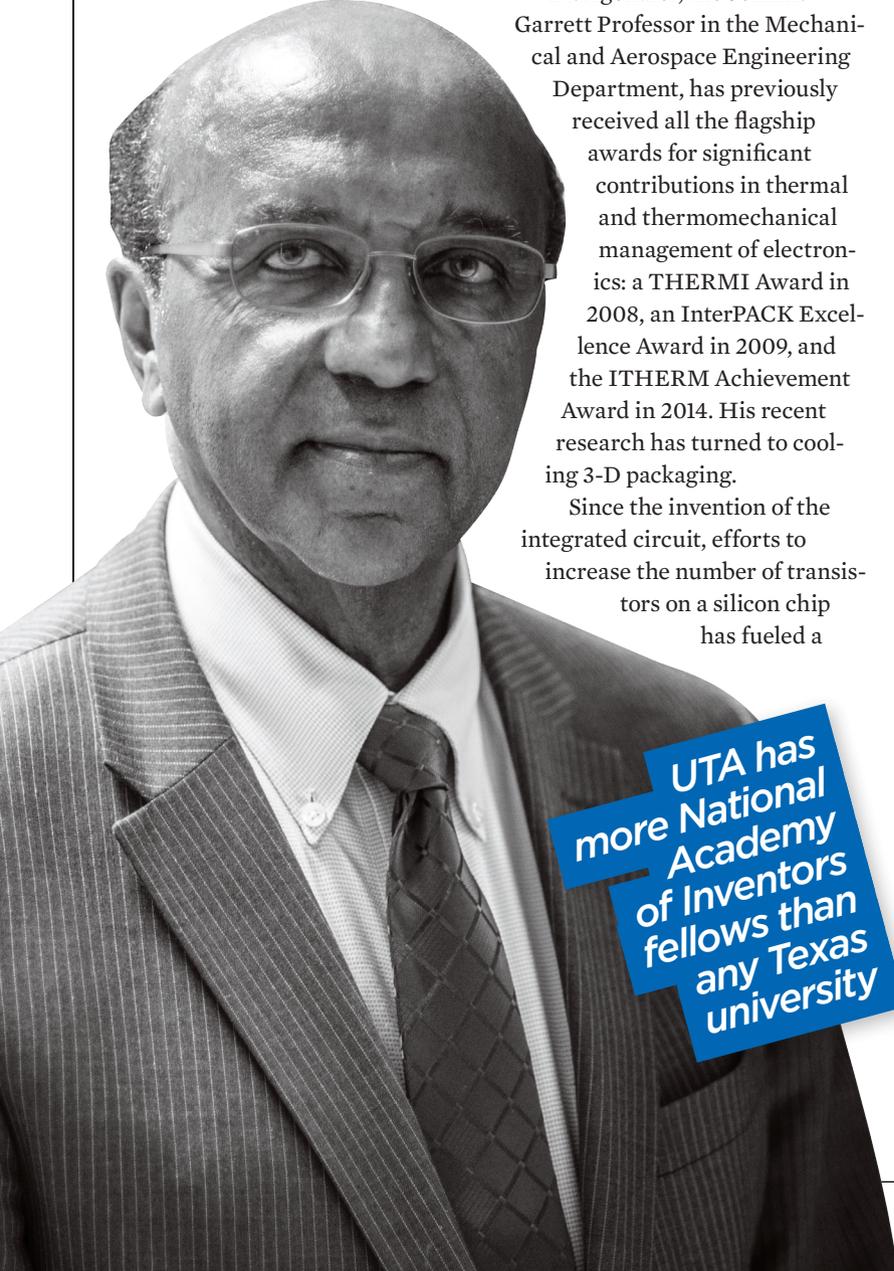
UTA HAS 12 NATIONAL ACADEMY OF INVENTORS FELLOWS

**No. 1**  
IN TEXAS

**No. 8**  
IN THE U.S.

UNIVERSITIES WITH THE MOST NAI FELLOWS

- University of South Florida (19)
- Massachusetts Institute of Technology (18)
- Harvard University (15)
- Stanford University (15)
- University of California, Berkeley (14)
- University of Florida (14)
- Northwestern University (13)
- UTA (12)
- California Institute of Technology (12)
- University of Southern California (12)
- University of Utah (12)



**UTA has more National Academy of Inventors fellows than any Texas university**