

JAMES M. TOUR, Ph.D.

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Research Areas

General: organic chemistry, materials science, polymer chemistry, nanomedicine, green carbon research, graphene, nanotechnology, environmental remediation.

Specific

Tour's scientific research areas include nanoelectronics, graphene electronics, silicon oxide electronics, green carbon research for enhanced oil recovery and environmentally friendly oil and gas extraction, graphene photovoltaics, carbon supercapacitors, lithium ion batteries, CO₂ capture, water splitting to H₂ and O₂, water purification, carbon nanotube and graphene synthetic modifications, graphene oxide, carbon composites, hydrogen storage on nanoengineered carbon scaffolds, nanoscale antioxidants and drug delivery vehicles for medical applications, and synthesis of single-molecule nanomachines which includes molecular motors, nanocars and motorized submersible single-molecule nanomachines. He has also developed strategies for retarding chemical terrorist attacks. For pre-college education, Tour developed the NanoKids concept for K-12 education in nanoscale science, and Dance Dance Revolution and Guitar Hero science packages for elementary and middle school education: SciRave that later expanded to Stemsopes-based SciRave. The SciRave program rose to be the #1 most widely adopted program in Texas to complement science instruction, and was used by over 450 school districts and 40,000 teachers with over 2 million student downloads.

Publication Record and Recognitions

Professor Tour has over 850 research publications, over 150 granted patents and over 100 pending patents. He has an *h*-index = 183 with total citations of 160,000. In 2024, he was elected to the National Academy of Engineering, and he won the Rice University, School of Natural Science, Research Award for the discovery and development of flash graphene. In 2021, he won the Oesper Award from the American Chemical Society which is awarded to "outstanding chemists for lifetime significant accomplishments in the field of chemistry with long-lasting impact on the chemical sciences." Tour became a Fellow of the Royal Society of Chemistry in 2020 and in the same year was awarded the Royal Society of Chemistry's Centenary Prize for innovations in materials chemistry with applications in medicine and nanotechnology. Based on the impact of his published work, in 2019 Tour was ranked in the top 0.004% of the 7 million scientists who have published at least 5 papers in their careers. He was inducted into the National Academy of Inventors in 2015. Tour was named among "The 50 Most Influential Scientists in the World Today" by TheBestSchools.org in 2019; listed in "The World's Most Influential Scientific Minds" by Thomson Reuters ScienceWatch.com in 2014; and recipient of the Trotter Prize in "Information, Complexity and Inference" in 2014; and was the Lady Davis Visiting Professor, Hebrew University, June, 2014. Tour was named "Scientist of the Year" by *R&D Magazine*, 2013. He was awarded the George R. Brown Award

for Superior Teaching, 2012, Rice University; won the ACS Nano Lectureship Award from the American Chemical Society, 2012; was the Lady Davis Visiting Professor, Hebrew University, June, 2011 and was elected Fellow of the American Association for the Advancement of Science (AAAS), 2009. Tour was ranked one of the Top 10 chemists in the world over the past decade, by a Thomson Reuters citations per publication index survey, 2009; won the Distinguished Alumni Award, Purdue University, 2009 and the Houston Technology Center's Nanotechnology Award in 2009. He won the Feynman Prize in Experimental Nanotechnology in 2008, the NASA Space Act Award in 2008 for his development of carbon nanotube reinforced elastomers, and the Arthur C. Cope Scholar Award from the American Chemical Society for his achievements in organic chemistry in 2007. Tour was the recipient of the George R. Brown Award for Superior Teaching in 2007. He also won the Small Times magazine's Innovator of the Year Award in 2006, the Nanotech Briefs Nano 50 Innovator Award in 2006, the Alan Berman Research Publication Award, Department of the Navy in 2006, the Southern Chemist of the Year Award from the American Chemical Society in 2005 and The Honda Innovation Award for Nanocars in 2005. Tour's paper on Nanocars was the most highly accessed journal article of all American Chemical Society articles in 2005, and it was listed by *LiveScience* as the second most influential paper in all of science in 2005. Tour has won several other national awards including the National Science Foundation Presidential Young Investigator Award in Polymer Chemistry and the Office of Naval Research Young Investigator Award in Polymer Chemistry.

Education

Stanford University, National Institutes of Health Postdoctoral Fellow, Organic Chemistry, 1987-88 with Barry M. Trost; University of Wisconsin, Postdoctoral Fellow, Organometallic Chemistry, 1986-87 with Barry M. Trost; Purdue University, Ph.D., Organic Chemistry, 1986 with E. Negishi; Syracuse University, B.S., Chemistry, 1981