

JAMES M. TOUR, Ph.D.

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Research Areas

General: organic chemistry, materials science, polymer chemistry, nanomedicine, green carbon research, graphene, nanotechnology, K-12 educational outreach.

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 also *Dance Dance Revolution* and *Guitar Hero* science packages for elementary and middle school education: *SciRave* (<http://www.scirave.org>) which later expanded to Stemsopes-based *SciRave* (<http://stemsopes.com/scirave/>). The *SciRave* program has risen to be the #1 most widely adopted program in Texas to complement science instruction, and it is currently used by over 450 school districts and 40,000 teachers with over 2 million student downloads.

Publication Record and Recognitions

Tour has over 700 research publications and over 140 patent families, with an h-index = 147 and total citations of ~103,000. 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

Professional Experience and Corporate Transitions

Tour is the founder and principal of NanoJtech Consultants, LLC, performing technology assessments for the prospective investor. Tour's intellectual property has been the seed for the formation of eight other companies including Weebit (silicon oxide electronic memory, a public company), Dotz (graphene quantum dots from coal, a public company), Tubz (graphene nanopillar electrodes for energy storage devices), Rust DeTour (corrosion inhibitor), NeuroCords (spinal cord repair), Xerient (treatment of pancreas cancer), Aqua Forma (water purification based upon laser-induced graphene), and other several other companies that are in formation. He served for many years on a variety of National Defense, Intelligence and Dept. of Commerce study groups.