

**Ralph & Helen Oesper Award Symposium,
Poster Session, and Banquet
October 22, 2021
9:00 am
Tangeman University Center
University of Cincinnati**

James M. Tour
Rice University

*"Flash Joule Heating for Preparative
Chemistry: From Graphene to Soil
Remediation, Battery Recycling and
More"*



James M. Tour, a synthetic organic chemist, received his Bachelor of Science degree in chemistry from Syracuse University, his Ph.D. in synthetic organic and organometallic chemistry from Purdue University, and postdoctoral training in synthetic organic chemistry at the University of Wisconsin and Stanford University. After spending 11 years on the faculty of the Department of Chemistry and Biochemistry at the University of South Carolina, he joined the Center for Nanoscale Science and Technology at Rice University in 1999 where he is presently the T. T. and W. F. Chao Professor of Chemistry, Professor of Computer Science, and Professor of Materials Science and NanoEngineering. Tour's scientific research areas include nanoelectronics, graphene electronics, silicon oxide electronics, carbon nanovectors for medical applications, 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, and synthesis of single-molecule [nanomachines](#) which includes molecular motors and nanocars. 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* (www.scirave.org) which later expanded to a Stemscopec-based *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 1 million student downloads.

Tour has over 738 research publications and over 140 patent families, with an h-index = 157 with total citations of >116,000. In 2020, he became a Fellow of the Royal Society of Chemistry 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.

Professor 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 several other companies including **Weebit** (silicon oxide electronic memory), **Dotz** (graphene quantum), **Zeta Energy** (batteries), **NeuroCords** (spinal cord repair), **Xerient** (treatment of pancreas cancer), **LIGC Application Ltd.** (laser-induced graphene), **Nanorobotics** (molecular nanomachines in medicine) **Universal Matter Ltd.** (US) and **Universal Matter Inc.** (Canada) (flash graphene synthesis), **Roswell Biotechnologies** (molecular electronic DNA sequencing) and **Rust Patrol** (corrosion inhibitors).

Professor Tour has served as a visiting scholar at Harvard University, on the Chemical Reviews Editorial Advisory Board, the Governor's Mathematics and Science Advisory Board for South Carolina, the Defense Science Study Group through the Institute for Defense Analyses, the Defense Science Board Chem/Nano Study Section, the Department of Commerce Emerging Technology and Research Advisory Committee and the MD Anderson Cancer Research Center's Competitive Grant Renewal Board. He has been active in consulting on several national defense-related topics, in addition to numerous other professional committees and panels.