

James Tour—leading scientist and Darwin skeptic

Jerry Bergman

The enormously successful career of James Tour in organic chemistry is reviewed. His life-long study of organic chemistry helped him to understand the major scientific problems with the theory of organic evolution. Although he was born and raised a Jew in New York City, he became a Christian in college and this worldview has played a significant role in his family life, and especially in his success as a scientist.

Professor James M. Tour is Rice University Chao Professor of Chemistry, computer science, mechanical engineering, and materials science. A renowned leader in his field, he is the premier scientist at Rice University, and his work is often cited in leading scientific journals.¹ After Nobel Laureate Rick Smalley's untimely death, the prolific Tour has successfully carried on Smalley's groundbreaking nanotechnology research. This 'world-class scientist' has revolutionized one of the most challenging fields of science.²

Of the more than 720,000 scientists who published chemistry papers in academic journals during the last decade, Tour was among the ten most-cited authors in the world. He authored 135 papers during this time, and the Thomson-Reuters list of research most referenced by other scientists in their scientific work ranked him in the top ten. Tour's scientific achievement "spans an incredible breadth, from building tiny cars and trucks out of molecules, to making computer memory from graphite, building tiny missiles that carry drugs to tumors and trying to cure radiation sickness."¹ Wade Adams, director of Rice's *Smalley Institute for Nanoscale Science and Technology*, noted that Tour is an "incredibly creative ... chemist. He makes molecules dance."¹

One of his most recent achievements to add to his already long list was to convert shortbread into graphene, a high-tech carbon form that is a promising material for high-speed circuits. A single thick layer of graphene is strong enough to hold the weight of an elephant.³

His background

Tour's B.S. in chemistry is from Syracuse University, and his Ph.D. in organic chemistry is from Purdue University. He completed his postdoctoral work at the University of Wisconsin-Madison (1986-1987) and at Stanford University (1987-1988). As a student he "just loved organic chemistry" and spent countless hours writing chemical structures and dreaming up methods that could be used to synthesize his creations.¹

After he graduated from Purdue, Tour rapidly became a leading organic chemist, synthesizing molecules for various important applications. In 1998 he had a breakthrough while building electronic components from the molecular level up rather than from the top down (the latter was the method used

with silicon chips). Because of the nano size of molecules, his techniques have the potential of revolutionizing, not only computer technology, but a wide range of other areas in the molecular electronics field. With a senior collaborator, Mark Reed,

"Tour created the first reversible electronic switch out of molecules, a stunning achievement that was published in the journal *Science* and caught Rick Smalley's attention. The epiphany came when Tour realized he could transcend organic chemistry by turning his talents at synthesizing complex molecules toward materials science."¹

Tour was then a professor at the university of South Carolina and, as a result of his enormous success, offers and counter-offers soon poured in. He ended up at Rice as one of the world's first academic nanotechnologists in a brand-new well-equipped building devoted to nanotechnology. Tour now manages multiple research projects and "has proved naysayers wrong over and over."¹

His work has been featured in the *New York Times*, *The Wall Street Journal* and *Science* magazine. He has also lectured at all the leading universities and Ivy League schools.⁴ During the last few years Tour has garnered widespread acclaim for his nanocars, constructed from a single molecule in the shape of a car with four rolling wheels, which look and move like real automobiles. He noted, "At first people laughed at us, saying it wasn't really a car because it didn't have a motor So we made a motorized car, and they laughed because it was so slow." His most recent automobile cranks out three million revolutions per second and he has just constructed one that rotates faster than is possible with a macroscopic car.¹ As of this writing he has 535 peer-reviewed scientific publications.

Students contribute

With his 1.5 million-dollar annual budget from industrial grants, Tour has hired about two-dozen graduate and postdoctoral students to work with him. Texas A&M University engineering Professor Jorge Seminario, who studied under Tour, wrote that "besides his extraordinary abilities as an instructor, he is also a mentor of leaders.

In every step of his leadership, he is teaching his associates and students how to be organized and look for the success of the project.”¹ Some of his students, such as Ashley Leonard, who earned her Ph.D. under Tour, noted that Tour’s Christian faith helped to make him a better mentor: “I always felt his doors were open to us ... I’m sure his faith created some of that hospitality.”¹

His Christian testimony

Professor Tour credits his success to his Christian faith. Colleagues say that Tour, a Messianic Jew who attends West University Baptist Church, does not push his faith on others but will freely discuss it if asked. When he speaks about his Christianity, Tour becomes emotive: “I believe, fundamentally, that God creates us all.” Although fully committed to his scientific work, “he is *passionate* about God. In a world that increasingly associates scientists with atheism or agnosticism, Tour derives his inspiration from deep faith.”¹ An example is

“He wakes up each morning at 3:30 a.m. ... to spend his first two hours with his Bible. ‘I read the Bible from Genesis Chapter 1 to Revelation Chapter 22, and when I’m done I start again,’ Tour said. ‘I’ve been doing this for over 30 years. There is this amazing richness. I take a passage and I say, ‘Lord speak to me. And then it just comes alive.’”¹

Although he puts in 12 hours a day at the chemistry lab, he is careful not to neglect his family. His family devotions begin at 5:30 am and last until 6:00 am, when he leaves for the university. His children have remarked on more than one occasion that this devotional time was one of their most important activities in growing up.⁵ He is also active in his ministry at Rice University, both by example and activity. For example, he purchases full-page ads in the local paper about the message of Christ. Also, from the time he was in college, he and his wife have hosted a weekly meal in their home to which they’ve invited some 30 to 40 students at a time to discuss the scriptures and apologetics.⁵

His concerns about Darwinism

Professor Tour has also been open about his scientific concerns about evolution, noting that “I stand in awe of God because of what he has done through his creation. My faith has been increased through my research.”⁴ As to the validity of evolution, he understands “better than most people how molecules come together, what they can and cannot do”,¹ but does not understand how macroevolution could occur. As a result, he does not accept



Figure 1. Professor James Tour

“... the notion of macroevolution, that new species evolve on their own. ‘I’ve asked people to explain it to me, and I still don’t understand it’ Tour notes rejecting macroevolution has caused problems for him in academia.”¹

He does understand how “small changes occur” but not how you get to “gross development of organs that are very different than they were previously.”⁶

A *New York Times* article quoted him as saying that his experience in chemistry and nanotechnology has showed him how difficult it was to maneuver atoms and molecules and this was one reason why he found it difficult to accept the conclusion that “nature was able to produce the machinery of cells through random processes” (as well as mutations and natural selection), the explanation

offered by evolution.⁷

Tour also believes that students should learn how to “analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information”, and this requirement should be applied to how biology textbooks used in state schools present both chemical and biological evolution. He also observed that, in “recent years, a growing number of scientists have raised significant issues that challenge various aspects of neo-Darwinian theory” and thus he concluded, “The best science education will present students with both ‘the strengths and weaknesses’ of neo-Darwinian theory.”⁸

Antagonism develops over his doubts about Darwin

Although a professor for over two decades, he has only recently seen the level of antagonism to his views on evolution escalate. He stresses that he never experienced conflict over his position on evolution in the early part of his career:

“If I did good science that was the measure of Jim Tour. The science. And that’s why I particularly appreciate this Thomson-Reuters list. It didn’t care what I believe about anything. Boom, there was the number. But lately, in the last five years or so, things have become different.”⁶

Tour added that he

“... can understand how people can be atheists. I was one for part of my life. I can understand how people think we just put God there so we can be content with ourselves and understand our surroundings.”⁶

He noted that if you have doubts about Darwin you are excluded from certain organizations, but he is encouraged that the people who are causing this problem are retiring, making way for a generation of younger scientists whom he believes are more tolerant. Noting that revolutions in science are won ‘one grave at a time’, he wrote that older scientists are retiring and

“... some of the younger people are resenting this sort of thing. The amazing thing about college students is that they’re better than they’ve ever been. They’re more socially conscious than they ever were. They all want to help the world. They all have this sense of social justice.”⁶

He notes that younger scientists are bothered by the fact that some people only let their friends into certain scientific organizations:

“With younger scientists it’s more about ... this person’s credentials ... what they have done. I have been told right to my face, ‘You can’t be here.’ And I say, ‘My credentials are stronger than lots of people who are getting in.’ And they say, ‘There’s no doubt about that.’”⁶

He noted that he does not experience overt attacks because of his faith but does experience problems over

“... the fact that I can’t buy into macroevolution ... I am very sincere about this. I don’t understand it. I’ve asked people to explain it to me, and I still don’t understand it. I hear their explanations and I don’t understand it.”⁶

When asked if conflicts exist between his faith and career he responded,

“... when appointments are not made. When fellowships are not granted on this basis, that hurts. ... I’m willing to stand up and say I don’t see any clothes on that emperor. I really don’t. I’m being very open, I don’t see it. That bothers a lot of people. ... It never used to. ... it’s just been in the recent past. I’ve been a professor now for more than 20 years. I never saw it before. This is a new thing ... There are certain organizations you can’t get in, because those who control the organizations won’t let you in if you don’t buy into ... macroevolution.”¹

He once signed a statement that said there are enough questions about evolution to warrant further investigation, an act that has caused him some problems. Tour added that we should research the validity of evolution, and he believes any good

“... scientist should just embrace you ... for saying that. ... What problem could they have with that? And I’ve asked them, and they say, ‘Well some people use this statement to try to keep evolution from being taught in schools.’ I can’t help what some people use that statement for.”⁶

He added that his doubts about Darwin have been a major detriment to his career, but when asked for details he responded he would rather not name names or give further

information “because it would identify people, and I don’t want to hurt them because I think so highly of them.”⁶

Fortunately, the Rice administration is firmly supportive of Tour and his work. His faith has allowed him to take chances as a scientist that led to his many enormous successes, such as finding a way to produce buckyballs in large quantities. He also has enormous success in his research, which earned him a cover story in *Scientific American*, and in 2007 he was given the Arthur C. Cope Scholar Award.^{9,10} He once wrote, “I’ve been hurt by thinking too small, but I have never been hurt by thinking too big.”⁶

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Jerry Bergman has nine academic degrees, including two PhDs. His major areas of study for his graduate work were in biology, chemistry, and psychology. He graduated from Wayne State University in Detroit, Medical University of Ohio in Toledo, University of Toledo and Bowling Green State University. A prolific writer with numerous publications, Dr Bergman has taught biology, chemistry and biochemistry at Northwest State in Archbold, Ohio, for over 24 years. He is also an adjunct Associate Professor at The University of Toledo Medical College.