

“When Things Get Small” Finds the Fun in Nanoscience

Maureen Byko

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Make no mistake, physicist Ivan Schuller has a passion for life in the lab. He is also realistic, though, and does not expect the nonscientific world to share his enthusiasm about magnetic thin films or nanodots. Not without some costumes, sound effects, and silliness, at least. Schuller, a distinguished professor of physics at the University of California at San Diego (UCSD), is co-producer of the movie “When Things Get Small,” a half-hour exercise in light science meant for the masses. Schuller believes it is a scientist’s obligation to demystify the profession for the general public, and the movie is his means of doing so. “There is a group of people that might be susceptible to science, but the way science is presented is always difficult and extremely boring and very pretentious,” Schuller said.

To reach that audience, Schuller teamed with Rich Wargo, science producer at the UCSD television studio, and created the Not Too Serious Labs production company. Their first project was “When Things Get Small,” a three-year undertaking that was released in March. “We decided that a way to approach this is to try to make something that is more entertainment than it is actually education,” Schuller said. “Maybe you’ll learn something along the way but that’s not the main thing; the main thing is to be entertained.”

The movie teaches some basic science concepts such as how many atoms are contained in a human hair—using

a stadium full of peanuts to give some substance to an otherwise unimaginable number—and then moves on to higher-level ideas such as the quantum tunneling of electrons. A magical tennis ball, acting as an electron passing through a colorful wall of atoms, vividly illustrates that lesson. And just when the movie script risks getting bogged down in facts, viewers encounter such oddities as a shrinking elephant or an unfortunate cat that takes an accidental (dramatized) hit from a flying magnet.

The star of the production is not Schuller, but a professional actor, Adam Smith, hired to make the movie more appealing to audiences. Although Schuller long ago considered a life in theater—before he determined acting was too difficult and turned to physics instead—he had no qualms about playing only a supporting role in the movie. “Typically scientists believe they can do everything themselves,” Schuller said. “I have the same attitude, but I wanted to make the best possible production I could make, and I was convinced I am not the best possible actor.”

The movie idea originated with the National Science Foundation (NSF), which funds Schuller’s research. The NSF wanted to make a movie about Schuller, following him through his day in the lab. Schuller was bored by the idea. “No one was going to watch it,” he said. But he was intrigued by the opportunity for NSF funding of a science-themed movie. So with the NSF stake and some in-kind contributions, such as the opportunity to film at San Diego’s Petco Park, Schuller and Wargo made their movie at a cost of about \$400,000. The attention and acclaim that followed came as a surprise to Schuller. With articles about the movie appearing in various mainstream media

outlets, he’s fielded numerous requests for interviews and speaking engagements—notoriety that does not always play well for the scholarly crowd.

Schuller’s credentials are impressive: he is a Fellow of the American Physical Society and recipient of awards from around the world. He has published more than 450 technical papers and patents and has given more than 250 invited lectures at international conferences. Yet, some scientists look at him differently now that he’s made his way into the mainstream. “My colleagues are critical of these kinds of activities, actually,” he said. Schuller is not sure where that criticism originates, but he thinks people expect him to abandon physics to become an entertainer—what might be considered selling out in the world of science. Yet just the opposite has happened, he said. “I have a very viable research life,” Schuller said. “I published more papers in high-profile journals than ever in my life this year, and my life is much more interesting.”

More disappointing than the response of colleagues is the scarcity of funding for a second movie. There has been much talk lately about a need to improve science literacy in the United States. Schuller feels an obligation to contribute to that cause and planned to do so with movies. So far, though, the outlook for “When Things Get Big” is grim, with little funding in sight.

At the end of “When Things Get Small,” after the credits roll, a voice assures the audience, “We’ll be back.” Schuller will do everything in his power to keep that promise. “I’ve decided it is important,” he said about taking science to the public. “I’m not going to just talk about it; I’m going to do it.”

Maureen Byko is managing editor of JOM.