

Addressing Quantum Science and Engineering with Broader Audiences

Carol Lynn Alpert, Center for Integrated Quantum Materials and Museum of Science, Boston

Abstract

Since the National Nanotechnology Initiative launched in 2003, the informal science learning community has learned a great deal about sharing nanoscience and nanotechnology with public audiences. The Nanoscale Informal Science Education Network estimates that it engendered over 50 million public interactions with NISE Net educational resources across the nation between 2005 and 2015. NSF-funded investigators also explored societal and environmental implications and changing public perceptions of nanotechnology. 'Nanotechnology' is now an everyday term, embedded in popular discourse. More recently, the NNI has helped spur the development of new tools and techniques to explore novel quantum materials (TIs, van der Waals heterostructures, atomic-scale crystal defects) and to harness quantum properties (spin, superposition, entanglement) for breakthrough technologies in computing, sensing, and communication. It is time for the education and outreach community to rise to this new challenge: successfully introducing discussion of the strange rules of quantum behavior with youth and lay audiences, despite its long-standing notoriety for impenetrability. (e.g. Richard Feynman: "If you think you understand quantum mechanics, you don't understand quantum mechanics.") This is an exciting challenge, and science communicators, artists, and educators are teaming up with a new generation of quantum scientists and engineers to pass interpretive models back and forth, testing for those able to tunnel through and succeed with broader audiences. Our goal is to enhance public awareness and understanding, stimulate discussion, and embolden young people to seek further educational opportunities. This talk will present some novel approaches, developing at the Museum of Science and elsewhere, to communicate what is now already underway: a new revolution in quantum technologies.