

2020 Medard W. Welch Awardee: Mark Hersam - "For pioneering contributions to the synthesis, surface science, chemical functionalization, and application of low-dimensional nanoelectronic materials"

AVS has honored the extraordinary contributions of Dr. Mark Hersam, Northwestern University, with the 2020 Medard W. Welch Award. This award acknowledges Mark's exceptional contributions to research in his field, as well as his professional service to the greater scientific community and to AVS. The Society established this award in 1969 to commemorate the pioneering efforts of M.W. Welch in founding and supporting the AVS. Mark has joined a list of remarkable awardees, and today we have the opportunity to get to know Mark a little better. He graciously granted AVS an interview.



Professional and Research Interests

Mark holds the position of Walter P. Murphy Professor of Materials Science and Engineering and Director of the Materials Research Center at Northwestern University. He also holds faculty appointments in the Departments of Chemistry, Applied Physics, Medicine, and Electrical Engineering. A typical day for Mark includes juggling his many responsibilities. He teaches, oversees his research group, writes papers, fundraises, edits journals, performs commercialization activities, and serves professionally whenever and wherever he can. In his role at Northwestern University, he immensely enjoys working with students (evidenced by his winning 8 Teacher of the Year Awards), but does not care for "being distracted by seemingly endless bureaucracy."

Mark describes his professional focus as high-purity nanoelectronic materials. He expanded on this further, saying that "in the twentieth century, advances in integrated circuit technology were driven completely by miniaturization (with minimal changes in the constituent materials). However, in the twenty-first century, the most significant advances in integrated circuit technology have been driven by new electronic materials. Similarly, advances in related renewable energy technologies (e.g., photovoltaics, batteries, etc.) have also been driven by new electronic materials." It excites Mark to "work on the key issues that underlie some of the most ubiquitous technologies in modern life." Furthermore, Mark looks forward to delving more deeply into some of the emerging topics in his research group including neuromorphic computing, quantum information sciences, and renewable energy technologies.

Mark has won innumerable professional awards and honors, including serving as a U.S. Science Envoy for the U.S. State Department, where he helped inform the White House about opportunities for international scientific cooperation. Also, he has been an Associate Editor of *ACS Nano* for the past decade. Additionally, as an elected member of the National Academy of Inventors, Mark has also founded two companies, NanoIntegris and Volexion, which are commercial suppliers of nanoelectronic and battery materials, respectively. A well-rounded professional, he has given ~500 invited conference presentations and colloquia, is a named inventor on ~100 issued and pending patents, and has published ~500 journal articles. Mark has been described as "dedicated," and this seems a truly accurate portrayal.

Mark has achieved much professionally, and feels that his academic research advisors “had the greatest formative influence on [his] professional life. He listed them, as follows: (1) Undergraduate Advisor: Professor David Ruzic, University of Illinois at Urbana-Champaign; (2) Master’s Degree Advisor: Professor Mark Welland, University of Cambridge; (3) PhD Advisor: Professor Joseph Lyding, University of Illinois; (4) IBM Fellowship Advisor: Dr. Phaedon Avouris, IBM T.J. Watson Research Center.”

Relationship with the AVS

Mark also feels that his experiences with AVS “have resulted in a dynamic and evolving professional network that [have] been central to nearly everything in [his] career.” Mark became involved with AVS when he attended the AVS International Symposium in Minneapolis in 1995, as an undergraduate researcher working with Professor David Ruzic of the University of Illinois at Urbana-Champaign. For the past 25 years, Mark has continued to be affiliated with AVS. Throughout this time, Mark has contributed a lot to AVS, including serving as AVS Nanoscale Science and Technology Division Chair. He was also named an AVS Fellow (2012) and an AVS Peter Mark Award winner (2006). Mark has “always been attracted to the interdisciplinarity of AVS, which mirrors [his] own broad and diverse research interests.”

Behind the Scenes

Outside of his vibrant professional life, Mark enjoys an active lifestyle including hiking, biking, boating, playing basketball, playing soccer, and golfing. His daughters also share his athletic proclivities, and Mark enjoys watching them play sports, including gymnastics, ice skating, and swimming. Mark has created a nice work-life balance, that seems perfectly encapsulated by his favorite quote, “The best way to predict your future is to create it.” – Abraham Lincoln. When asked if he could leave one piece of advice for our future generations, he thoughtfully advised, “Avoid getting caught in your own echo chamber – instead, always make time to listen, understand, and have compassion for another point of view, particularly when it diverges far from your own perspective.” This could not be better advice for the uncertain and global times in which we live. Dr. Mark Hersam is a deserving awardee, and we hope you will join AVS in congratulating him!