



## **Carol Handwerker**

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[Carol A. Handwerker](#) is the Reinhardt Schuhmann, Jr. Professor of Materials Engineering and Professor of Environmental and Ecological Engineering at Purdue University. Her research areas include: developing sustainable, innovative interconnect technologies for next-generation microelectronics and thin film solar cells, improving the reliability of Pb-free solder interconnects, particularly for high performance, military, and aerospace electronic systems, integrating sustainability in the design of new electronic materials, processes, and products, identifying and implementing strategies to move R&D into manufacturing and commercialization, using roadmapping, techno-economic analysis, and formation of self-assembling socio-ecological systems, and controlling interface properties to design microstructures in polycrystalline materials and thin films

Before joining Purdue in 2005, she was at NIST for 21 years, serving as the co-lead for Advanced Packaging as well as the Chief of the NIST Metallurgy Division for her last nine years at NIST. At Purdue Handwerker leads a \$40M, 5-year DoD program in facilitating the transition to Pb-free electronics in defense systems and is co-PI of SCALE, a major DOD program on workforce development for advanced microelectronics. She was the Director of the Purdue-Tuskegee NSF Integrative Education and Research Traineeship program (IGERT) on Globally Sustainable Electronics (supporting 28 two-year fellowships from 2012-2019), served as a member of the iNEMI Environmental Leadership Steering Committee, along with Intel, Dell, and Lenovo and co-lead the iNEMI project on Value Recovery for End-of Life Electronics, with Seagate, Google, Microsoft, Cisco as team members. She was the co-lead for Pb-free alloy selection in the iNEMI Pb-free Solder Project that selected and implemented SAC305 as the global replacement for Sn-Pb in consumer electronics. She is a Fellow of the American Association for the Advancement of Science (AAAS), ASM International, the American Ceramic Society, the Materials Research Society (MRS), and the Minerals, Metals and Materials Society (TMS), and received the TMS Leadership Award, the TMS Applications to Practice Award, the TMS/FMD John Bardeen Award, the Federal Laboratory Consortium Award for Excellence in Technology Transfer, and the Department of Commerce Gold Medal for her leadership in Pb-free electronics. Handwerker

received a BA in Art History Wellesley College, a B.S. in materials science and engineering and M.S., and Sc.D. in ceramic science from the Massachusetts Institute of Technology.