

# Nanopackaging: Nanotechnologies in Microelectronics Packaging

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Nanotechnologies offer a variety of materials options for reliability improvements in microelectronics packaging, primarily in the applications of nanoparticle nanocomposites, or in the exploitation of the superior properties of carbon nanotubes and graphene. Nanocomposite materials are studied for resistors, high-k dielectrics, electrically conductive adhesives, conductive “inks,” underfill fillers, and solder enhancements, while CNTs and graphene may also find thermal, interconnect, and shielding applications. The talk will focus on these materials technologies, with some discussion of nanoparticle and CNT properties. Modeling, post-CMOS reliability issues, and EHS issues in nanotechnologies manufacturing may also be covered, time permitting.

## BIOGRAPHY

Jim is an ECE Professor at Portland State University, Oregon, and Professor Emeritus at SUNY-Binghamton, having served as Department Chair at both, and is an IEEE Fellow. He has B.Sc. and M.Sc. degrees in Physics from the University of Auckland, NZ, and a Ph.D. in EE from the University of Saskatchewan, Canada, and was the first Director of Binghamton’s Institute for Research in Electronics Packaging. Jim has served the IEEE Components Packaging and Manufacturing Technology (CPMT) Society as Treasurer (1991-1997,) BoG member (1996-1998, 2011-2013), VP for Conferences (1998-2003,) Distinguished Lecturer (2000- ,) CPT-Transactions Associate-Editor (1998- ,) IEEE Nanotechnology Council representative (2007- ,) etc., and won the 2005 CPMT David Feldman Outstanding Contribution Award. He has edited four books on electronics packaging, including one on nanopackaging, co-authored another, and has two more in preparation. He established the Nanotechnology Council Nanopackaging TC, serves as the NTC Awards Chair, and contributes to IEEE Nanotechnology Magazine. He was General Conference Chair of Adhesives in Electronics (1998,) Advanced Packaging Materials (2001,) Polytronic (2004,) and IEEE NANO (2011,) and serves on multiple conference program committees, e.g as Chair of the Nanopackaging program committee for IEEE NANO 2012. His research is currently focused on ICAs, nanoelectronics, and nanoelectronics packaging. He is actively involved in international engineering education and at the local IEEE Oregon level has chaired both the Education Society and CPMT Chapters. He spent 2008-2009 in visiting positions with the University of Greenwich, Chalmers University of Technology, Dresden University of Technology, Helsinki University of Technology (with a Nokia-Fulbright Fellowship), and the University of Canterbury NZ (on an Erskine Fellowship,) and held a Royal Academy of Engineering Distinguished Visiting Fellowship at Loughborough University of Technology (UK.) last year.