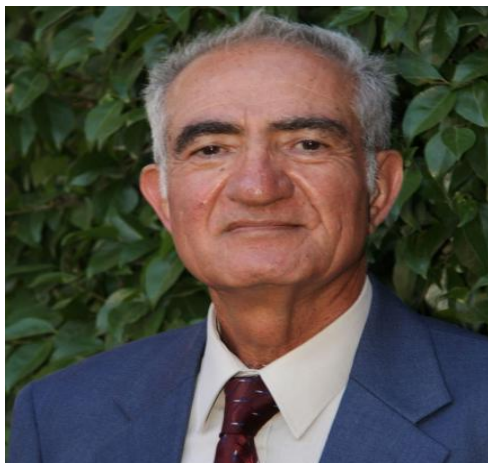


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## Convergent Research on Environmental Aspects of Semiconductor Manufacturing

Farhang Shadman



**Abstract:** Semiconductor fabrication processes exhibit certain environmental challenges that are unique to all nano-manufacturing industry sector. The uniqueness stems from the fact that nano-manufacturing is not a simple extension of practices in conventional industries. The key issues are related to the large usage of natural resources like water and energy, the large volume of complex waste generated on the manufacturing sites, and the environmental and health issues associated with the large number of chemicals, some quite exotic, that are introduced at a very rapid pace in the manufacturing of semiconductor devices. In this presentation, some highlights of these challenges, the research approach, and the results leading to solving the issues will be presented. The proactive approach that this industry has taken to solving the environmental issues and the breakthroughs, many of which are also applicable to other industry sectors, will be discussed. The role of multi-disciplinary approach and university-industry collaboration in conducting the research and development in this area will also be presented.

**Bio:** Dr. Shadman is a Regents Professor of Chemical and Environmental Engineering (joint appointment as a Professor of Optical Sciences) at the University of Arizona and the Director of the Engineering Research Center for Environmentally Benign Semiconductor Manufacturing. He was also the founder and Director of Sematech Center for Defect Control in Semiconductor Manufacturing from 1986 to 1996. Dr. Shadman (PhD from the University of California-Berkeley, 1972) is the author of more than 110 journal articles, 3 book chapters, and 21 patents/invention disclosures. Among his awards are Akira-Inoue Award (2002), Landmark Innovation Award (2000), SRC/Sematech/SIA Excellence in Research Award (1998 and 1992), and Invention Awards (SRC 1991 and 1992). He is a Fellow of American Institute of Chemical Engineers.