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## Gigantic Challenges, Nano-Solutions

**Maher S. Amer**

Department of Mechanical and Materials Engineering, Wright State University, USA

As we are rapidly approaching year 2050 and the population capacity of planet Earth, it becomes a must to, sooner better than later, face our gigantic challenges. It is widely known that our global stability is seriously threatened by the consequences of our depleting energy and clean water resources. Extensive scientific research over the past 15 years has shown that Nano-technology-based solutions hold promising answers to our pressing needs. However, it is very important to understand the thermodynamic fundamentals governing the structure and performance of such thermodynamic small systems especially their ability to selectively interact with certain chemical moieties and with electromagnetic radiation. Understanding such fundamentals will definitely lead to unique solutions for our pressing challenges. Nanostructured films and membranes engineered to selectively adsorb unwanted chemical, and biological species can provide a valuable solution for water treatment, desalination, and can definitely contribute to the world's water and environmental challenge. In addition, photovoltaics batteries based on nanostructured fullerene films are also a very promising route to explore when addressing energy challenges. In this talk, we will discuss both experimental and molecular simulation fundamental work, done in our research group, as related to Energy and water challenges.

### Biography:

Dr. Amer is Professor of Materials Science and Engineering, a senior von Humboldt Fellow, Max Planck Society, Germany, and a former Visiting Fellow of the Fitzwilliam College, University of Cambridge, England. Dr. Amer is a member of a number of national and international committees focused on nanomanufacturing and higher education accreditation. He received his Ph.D. from Drexel University 1995. Prof. Amer is currently serving as a US Fulbright Scholar.