

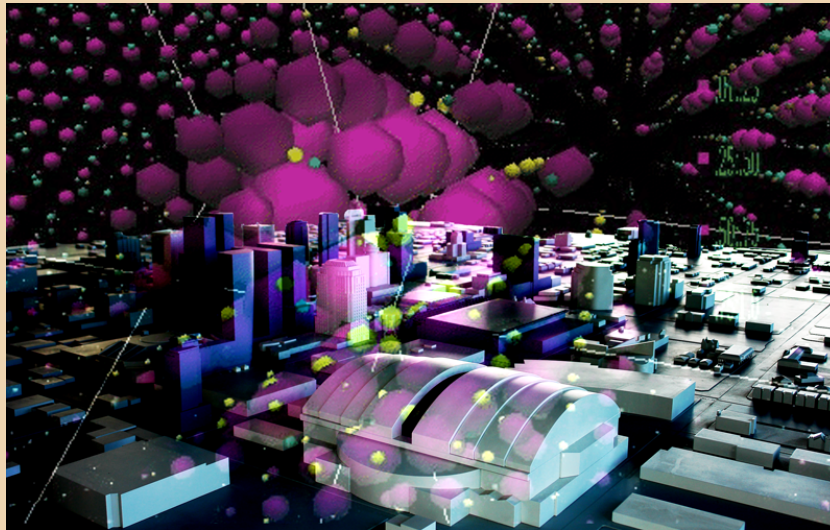
Discussions about the potential benefits of nano-scale science and engineering (NSE) often maintain that nanotechnologies will be crucial, if not decisive, for solving urban problems. NSE is expected to provide innovative applications in buildings, energy, infrastructures, water, transportation, security, information and so on. For example, imagine photovoltaic materials that can cover horizontal as well as vertical building surfaces. Enhanced by multi-functional nano-scale designs, they may be able to not only capture light and convert it into electric power for their buildings, but also re-emit visible light into their buildings after dark.

Yet the vast majority of these visions of “urban nanotechnologies” are projections of isolated applications. Likewise, studies that emphasize the potential contributions of urban nanotechnologies to sustainability usually address diverse but narrowly-defined urban domains from construction to energy and water supply to transportation. Each particular application is imagined to provide benefits. The problem, of course, is that these visions are one-sided and only marginally embedded in real-world urban contexts. Such visions rarely address the complex reality of cities with their interwoven social, technical and ecological components.

Arnim Wiek
Assistant Professor
School of Sustainability,
Arizona State University

Sander van der Leeuw
Professor and Director, School of
Human Evolution and Social Change
Arizona State University

Will Nanotechnology Help or Harm Our Cities? *New CNS-ASU Research Theme Studies* *Emerging Technology & the Future of the City*



In order to reflect critically on the potential of these nanotechnological innovations to mitigate or solve urban sustainability problems, we must understand them from within the rich and complex reality of cities. We must recognize that not all sustainability problems will yield to technology. To determine which will and which won't, we must understand the costs of nanotechnological fixes and ask whether their promised benefits justify their associated costs.

With these issues in mind, CNS-ASU has launched a new Thematic Research Cluster (TRC) dedicated to studying urban design, materials, and the built environment (aka “Nano and the City”). Its goal is to investigate the nano-enabled city of the future and address the links among NSE, the built environment, social structures and sustainability. The TRC will map out the diversity in problem perceptions, future visions, value-laden sustainability appraisals, and related implementation strategies across various stakeholder groups. Deliberative research will be conducted with various urban communities including public policymakers, business people, engineers, interest groups representatives and citizens from the Phoenix metropolitan area. Deliberative and visioning approaches that CNS-ASU has previously pioneered will be used to identify points of consensus as well as contest that might foster or hamper progress towards a sustainable co-evolution of NSE, the built environment, and societal needs. With the objective of better understanding, from a systemic perspective, supply and demand, the TRC will create a Nanotechnologies in City Environments (NICE) database. It will allow researchers to search, view and comment on urban nanotechnologies with a particular view toward their functionality, nano-scale mechanism, potential benefits and hazards, and related urban sustainability issues.