In the context of scalar contradictions and constraints architects are seeking new spheres of crafting matter inspired by nature’s design efficiencies across scales. Tantalized by the possibility of revolutionizing our ability to shape the biophysical and aesthetic properties of materials, architects probe into new processes of shaping integrated functions in matter. In this process designers are establishing intersections of architecture with science exploring new computational models, processing and production methods for shaping functionalized materials. Emerging interdisciplinary models in this frontier become a testing ground for new scalar thresholds and scalability. And contradictions ranging from measurement to testing and validation processes are inherent to this exercise. Yet, rather than yielding solely new technologies, the disciplinary methodological differences can lead to the creation of new knowledge – new habits of craft. This presentation will discuss contradictions and convergences patterns faced in crafting matter across scales and their transformative potential for paradigm shifts in tackling critical socioeconomic, cultural and environmental challenges of the built environment. Spinning from this conceptual scaffold, Gutierrez will present the investigations of her research group - BIOMS where architecture intersects with science and engineering for designing material systems from the nano to the building scale.

Maria-Paz Gutierrez is an architect and Associate Professor of Architecture at the University of California, Berkeley. Her research focuses on material invention by integrative nano, micro and building scale design. Gutierrez investigation centres on the role of material invention and craft for addressing critical socioeconomic and environmental urban and rural challenges of the 21st century. Her design explores integrative approaches in material invention pertaining to cultural and biophysical paradigms of natural and human resources particularly in settings under risk. In 2008 Gutierrez founded BIOMS, an interdisciplinary research group with support from organizations such as NSF, EPA and DOE. Gutierrez is recipient of numerous design and interdisciplinary awards including the 2001 AIA Academic Medal, the 2011 Evolo International Competition Finalist and