

**PLENARY LECTURE: BUILDING THE FOUNDATIONS OF SUSTAINABILITY THROUGH
TRANSDISCIPLINARY SCIENCE AND ENGINEERING**

Friday, 11 April 8:30am-10:00am

UNM SUB Room: Lobo

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While most pundits agree that efforts to build sustainable societies in the face of rapid environmental change will require contributions from many fields (e.g., architecture, economics, public policy), they frequently add science to the list only as an afterthought. If science has triumphed in convincing the world that anthropogenic climate change is a serious threat to human societies, is it now time to thank the climate science cavalry for their valuable contributions and call in the regular troops of economists and policy makers to fight the war?

Perhaps a smarter strategy recognizes that building a sustainable future for human societies means finding a way to co-evolve with a dynamic Earth system that we do not yet fully understand. With a focus on no less than survival of our species, the time is ripe for a new kind of science, one that transcends conventional disciplinary boundaries and embraces an intellectual continuum between science and engineering. Grounded in complexity theory and a rapidly developing understanding of Earth history, we now need to deploy technologies on a global scale to monitor earth system evolution. Only then can we judge the effectiveness (or ineffectiveness) of developing strategies for the mitigation of and adaptation to environmental changes that threaten our future. Ultimately, we must also recognize that the Earth system is not isolated and thus subject to catastrophic events (such as asteroid collisions) that may disrupt the global ecosystem in ways that are impossible to overcome. This suggests that sustainability research also should include studies of the Moon and nearby planets to provide a context for human exploration and colonization. Given the high stakes, the quest for sustainable societies may be driving a transformative integration of disciplinary approaches into the science of human survival.