

# Civil & Environmental Engineering Distinguished Seminar Series

## Zhen Chen, Ph. D.

### Simulation-Based Engineering Science (SBS) to Promote Interdisciplinary Research Education

Due to the limitation of experimental techniques available and the need for cost-effective designs, Simulation-Based Engineering and Science (SBES) is playing an increasingly important role in engineering practice. For example, the development of SBES is essential in understanding and predicting the multiscale structural responses subject to extreme loading conditions. In this presentation, an introduction will be given on model-based simulation of structural failure responses subjected to impact, blast and fragment loadings, with the Material Point Method ([http://en.wikipedia.org/wiki/Material\\_Point\\_Method](http://en.wikipedia.org/wiki/Material_Point_Method)) which is an extension from Computational Fluid Dynamics to Computational Solid Dynamics. Since quasi-brittle materials such as concrete and rock are commonly used in the infrastructures, modeling and computational aspects of these engineering materials will also be discussed, with a focus on the post-peak responses that might involve multi-physical phenomena. In addition, recent research results on multiscale simulation of bio and nano structural responses will be shown to further demonstrate the potential of SBES in promoting interdisciplinary research and education in Civil and Environmental Engineering in particular, and engineering and science in general.



**Zhen Chen** is currently the C.W. LaPierre Professor of the Department of Civil & Environmental Engineering, University of Missouri-Columbia. Chen earned his Ph.D., University of New Mexico, 1989; M.S., University of New Mexico, and his B.E., Shanghai University (previously Shanghai University of Science & Technology), China. He has received honors and awards in the following: the NSF-CAREER Award, Fellow of the American Society of Mechanical Engineers, Yangtze Visiting Chair Professor appointed by the Ministry of Education in China Faculty Research Award in the College of Engineering at MU Outstanding Youth Award, National Science Foundation of China.

**Tuesday, October 11, 2011**

**1:45 p.m. – 2:45 p.m.**

**332 Curry Student Center**