KEYNOTE TALK
Monday, September 26, 2011
1:30PM – 2:30 PM / Ballroom 1-2

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Real-Time Modeling and Rendering of Natural Phenomena

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Abstract

Modeling and rendering natural phenomena, which includes all components of biophysical ecology, atmospherics, photon transport, and air and water flow, remains a challenging area for computer graphics research. Whether models are physically-based or procedural, model processing is almost always characterized by substantial computational demands which have almost always precluded real-time performance. Nevertheless, the recent development of new, highly parallel computational models, coupled with dramatic performance improvements in GPU-based execution platforms, has brought real-time modeling and rendering within reach. The talk will focus on the natural synergy between GPU-based computing and the so-called lattice-Boltzmann methods for solutions to PDEs. Examples will include photon transport for global illumination and modeling and rendering of atmospheric clouds, forest ecosystems, and ocean waves.

Speaker Bio-Sketch: Robert Geist is a Professor in the School of Computing at Clemson University. He served as Interim Director of the School in 2007-2008, and he is co-founder of Clemson's Digital Production Arts Program. He received an M.A. in Computer science from Duke University and a Ph.D. in mathematics from the University of Notre Dame. He was an Associate Professor of Mathematics at the University of North Carolina at Pembroke and an Associate Professor of Computer Science at Duke University before joining the faculty at Clemson University. He is a member of IFIP WG 7.3, a recipient of the Günther Enderle Award (Best Paper, Eurographics), and a Distinguished Educator of the ACM.