Title of talk: Simulating and Visualizing Tornadic Thunderstorms at Ultra-High Resolution

Abstract: Tornadoes and the storms that spawn them continue to be the target of active research due to the incredible amounts of damage the most intense events cause. While field campaigns and numerical studies have served to greatly deepen our knowledge of supercell thunderstorms and the conditions in which they form, our understanding of the storms that produce the most long-lived, devastating tornadoes remains elusive. In this presentation, results from a supercell thunderstorm simulation conducted on the Blue Waters supercomputer are presented. The simulated storm, run at ultra-high resolution, produces an EF5 tornado that is on the ground for nearly two hours. State-of-the-art visualization techniques are applied to the model output, revealing newly-discovered flow structures that may play a key role in helping maintain tornadoes in the least common, but most destructive, storms. Over 100 terabytes of data were produced by the simulation, and the technical details involving the efficient writing, organizing, and visualizing the data are also discussed.