1036-82-162 **Eric Vanden-Eijnden*** (eve2@cims.nyu.edu), 251 Mercer street, New York, NY 10012. *Rare Events in Complex Systems.*

Many processes in nature occur in the form of rare but important events. Well known examples of such events include conformation changes of biomolecules, chemical reactions, and nucleation events during phase transformation. Rare events do not happen very often on the internal clock of the system (which makes their simulation very challenging), but this clock can be very fast and this leaves plenty of room for the appearance of rare events in our daily life. I will review classical theories for the description of rare events, recent theoretical developments such as Transition Path Theory, concept such as reaction coordinate or free energy of a reaction and I will discuss how to compute the pathway and rate of rare events efficiently using the String Method. As illustrations, I will discuss the hydrophobic collapse of a polymeric chain, phase transitions in the Ising model, and a genetic toggle switch. (Received January 21, 2008)