Abstract for Darrell Velegol

TITLE: Chemical game theory

ABSTRACT: The purpose of this talk is to describe a new framework for representing and solving strategic game theory problems. We call this framework "Chemical Game Theory" (CGT). CGT uses fundamentals from chemistry and chemical engineering to analyze strategic decisions problem, which are often analyzed using traditional game theory. In strategic decisions, players each can choose from among multiple alternative possibilities, and the final decision depends upon the collective choices of all players. In this talk we make several observations about traditional game theory, and then we compare to CGT. In CGT, the players' choices are treated as metaphorical molecules, and outcomes are calculated according to chemical reaction methods. The important concept of entropic choices is introduced, and pre-bias effects are included as initial concentrations of reactants. CGT is not a generalization of classical game theory; rather, it represents contested decision problems differently, and gives different solutions. We aim is to show that Chemistry can provide a "knowlecular approach" to analyzing contested decisions, with a rich capacity to represent contested decision-making scenarios and serve as a decision-making algorithm.