Emergence of Function in Molecular Assemblies
Symposium at Fall07 in Boston (Aug 19-23)

(1) Nanoparticle Self-Assembly

Session 1: Anna Balazs, Rob Whetten, Ralph Nuzzo, Claudio Zannoni
Session 2: George Schatz, Eran Rabani, Andrew Shreve, John Fourkas
Session 3: Andrew Lyon, Andrea Liu?, Ritesh Agarwal, George Whitesides

(2) Bioassemblies, Biomaterials and Microfluidics

Session 1: Ka Yee Lee, Atul Parikh, Bill Gelbart**,** Nigel Goldenfeld
Session 2: Paul Chaiken, John Crocker, David Pine, Eric Winfree
Session 3: Rustem Ismagilov, Paul Rothemund, David Weitz, Sharon Glotzer

3) Molecular Electronics and Electronic and Magnetic Materials

Session 1: Jean-Luc Bredas, Daniel Cox, Abe Nitzan, Alison Walker
Session 2: Paul Alivisatos, Mark Ratner, Antoine Kahn, Sarah Tolbert

Where a question mark has been added to a few individuals who have accepted the invitation contingent upon the resolution of scheduling conflicts.

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Since P.W.Anderson's article in Science (1972), there has been recognition that complex systems may differ dramatically from the linear limit of their components. In thermodynamics, such observables would be characterized as containing (possibly extreme) nonadditive contributions. From a dynamic (or nonequilibrium) perspective, such behavior "emerges" in an unexpected fashion in the sense that it is not readily apparent when investigating smaller components of the complex system. The application of these concepts from physics to materials science has recently been recognized in molecular-scale assemblies. Material nanoscience research has matured to the point that its practitioners modify components at the molecular level and where perhaps pairwise interactions are well-known. Nevertheless, emergent properties arise that cannot fully be explained by an understanding of these isolated components. Physical chemistry lies rightly in the middle of this, and has a significant role to play in the development and application of these ideas. This symposium will bring together experimentalists and theoreticians in material science, physics and physical chemistry in order to integrate their efforts towards the understanding of the emergence of function (at whatever length scale) due to the collective nonlinear interactions within molecular assemblies.

Three targeted subtopics will be specifically addressed:

1. **Nanoparticle Self-Assembly**
2. **Bioassemblies, Biomaterials and Microfluidics**
3. **Molecular Electronics and Electronic and Magnetic Materials**
