

**Dr. Stephen K. Gray**

Senior Scientist and Group Leader

Theme: Theory and Modeling

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**Research Summary:**

I am interested in the theory and modeling of dynamical processes in nanosystems. Particular emphasis is placed on modeling light interactions with metallic nanostructures via rigorous electrodynamics simulations. I also study the quantum dynamics of molecular systems within nanoscale environments.

**Selected Recent Publications:**

Optically Directed Mesoscale Assembly and Patterning of Electrically Conductive Organic-Inorganic Hybrid Structures, J. T. Bahns, S. K. R. S. Sankaranarayanan, N. C. Giebink, H. Xiong, and S. K. Gray, *Advanced Materials*, **24**, OP242-OP246 (2012).

Spatial Confinement of Electromagnetic Hot and Cold Spots in Gold Nanocubes, M. Haggui, M. Dridi, J. Plain, S. Marguet, H. Perez, G. C. Schatz, G. P. Wiederrecht, S. K. Gray, and R. Bachelot, *ACS Nano* **6**, 1299-1307 (2012).

Polarization Properties of a CdSe/ZnS and Au Nanoparticle Dimer, D. Ratchford, F. Shafiei, S. K. Gray, and X. Li, *ChemPhysChem* **13**, 2522-2525 (2012).

Emergence of Excited-State Plasmon Modes in Linear Chains from Time-Dependent Quantum Mechanics, A. E. DePrince, III, M. Pelton, J. R. Guest, and S. K. Gray, *Phys. Rev. Lett.* **107**, 196806 (2011).

Plasmon-Driven Selective Deposition of Au Bipyramidal Nanoparticles, M. J. Guffey, R. Miller, S. K. Gray, and N. F. Scherer, *Nano Letters*, **11**, 4058-4066 (2011).