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Research summary:

Current research focuses on developing hybrid nanomaterials with new optical and physical properties that emerge from the interaction among strongly coupled nanoscale components. The goal is to achieve a fundamental understanding of the relationship between nanometer-scale structure and physical properties through an integrated approach of chemical synthesis and assembly, nanofabrication, modeling, and advanced optical characterization. Measurement efforts emphasize single-particle optical measurements and ultrafast laser spectroscopy.

Selected recent publications:

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X. Wu, S. K. Gray, and M. Pelton, "Quantum-dot-induced transparency in a nanoscale plasmonic resonator," *Opt. Express* **18**, 23633 (2010).

Y. Wang, A. E. DePrince III, S. K. Gray, X.-M. Lin, and M. Pelton, "Solvent-mediated end-to-end assembly of gold nanorods," *J. Phys. Chem. Lett.* **1**, 2692 (2010).

M. Pelton, J. Burgin, M. Liu, P. Guyot-Sionnest, and D. Gosztola, "Damping of acoustic vibrations in gold nanoparticles," *Nature Nanotech.* **4**, 492 (2009).

M. Liu, T.-W. Lee, S. K. Gray, P. Guyot-Sionnest, and M. Pelton, "Excitation of dark plasmons in metal nanostructures by a localized emitter," *Phys. Rev. Lett.* **102**, 107401 (2009).

M. Pelton, J. Aizpurua, and G. W. Bryant, "Metal-nanoparticle plasmonics," *Laser Photonics Rev.* **2**, 135 (2008).

M. Pelton, G. Smith, N. F. Scherer, and R. A. Marcus, "Evidence for a diffusion-controlled mechanism for fluorescence blinking of colloidal quantum dots," *Proc. Natl. Acad. Sci. USA* **104**, 14249 (2007).