Dr. Jay Foley
Postdoctoral Fellow

Theory and Modeling Group
Phone: 630-252-2734
E-mail: jjfoley@anl.gov

Argonne National Laboratory
Center for Nanoscale Materials
9700 S Cass Ave., Building 440
Argonne, IL 60439-4806

Ph.D., Theoretical Physical Chemistry, University of Chicago
B.S., Chemistry, Georgia Institute of Technology

Research Summary:

I am interested in multi-scale approaches for studying light-matter interactions to understand and discover novel phenomena. Examples of current interest include surprising plasmonic enhancement in metal nanoparticles in the quantum size regime, generation of inhomogeneous surface plasmon polaritons on heterogeneous metal surfaces, and collective excited-state dynamics in correlated molecular systems.

Selected Recent Publications (for complete list see http://bit.ly/Mkvwq9)

J. J. Foley IV, J. M. McMahon, G. C. Schatz, S. K. Gray, "The Refraction of Surface Plasmon Polaritons," Submitted to *Phys. Rev. Lett.* (2013).

E. Palacios , A. Chen, **J. J. Foley IV**, S. K. Gray, U. Welp, D. Rosenmann, and V. K. Vlasko-Vlasov, "Ultra-Confined Modes in Metal Nanoparticle Arrays for Subwavelength Light Guiding and Amplification," *Adv. Opt. Mat.* (2014)

Y. Sun *, **J. J. Foley IV***, S. Peng , Z. Li , and S. K. Gray, "Interfaced metal heterodimers in the quantum size regime," *Nano Lett. 13* (2013)

J. J. Foley IV, D. A. Mazziotti, "Cage versus Prism: Electronic Energies of the Water Hexamer," *J. Phys. Chem. A* 117 (2013)

J. J. Foley IV, D. A. Mazziotti, "Measurement-driven Reconstruction of Many-particle Quantum Processes by Semidefinite Programming with Application to Photosynthetic Light Harvesting", *Phys. Rev. A* 86 (2012)

*Authors contributed equally