



## Gary Wiederrecht

*Chemist and Group Leader*

Nanophotonics Group

Phone: 630-252-4586

Fax: 630-252-4646

E-mail: [Wiederrecht@anl.gov](mailto:Wiederrecht@anl.gov)

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

Ph.D., Physical Chemistry, Massachusetts  
Institute of Technology

### Research summary:

Our group objective is to achieve control of optical energy and its conversion on the nanometer scale by combining the properties of metal, organic, semiconductor, and dielectric materials to create new, combined states of light and matter. My current research focuses on (a) ultrafast excitation processes of plasmons and their interactions with organic molecular excitations, (b) new microscopies with spatial resolution below the diffraction limit, and (c) nanophotonic structures for the concentration and conversion of solar energy.

### Selected recent publications:

“Resonance-shifting to circumvent reabsorption loss in luminescent solar concentrators,” N. C. Giebink, G. P. Wiederrecht, and M. R. Wasielewski, *Nature Photon.* **5**, 694 (2011).

“Planar dye-sensitized photovoltaics through cavity mode enhancement,” A. B. F. Martinson, N. C. Giebink, G. P. Wiederrecht, D. Rosenmann, and M. R. Wasielewski, *Energy Environ. Sci.* **4**, 2980 (2011).

“Designed ultrafast optical nonlinearity in a plasmonic nanorod metamaterial enhanced by nonlocality,” G. A. Wurtz, R. Pollard, W. Hendren, G. P. Wiederrecht, D. J. Gosztola, V. A. Podolskiy, and A. V. Zayats, *Nature Nanotech.* **6**, 107 (2011).

“Self-consistent model of light-induced molecular motion around metallic nanostructures,” M. Juan, J. Plain, R. Bachelot, P. Royer, S. K. Gray, G. P. Wiederrecht, *J. Phys. Chem. Lett.* **1**, 2228 (2010).

“Tuning of an optical dimer nanoantenna by electrically controlling its load impedance,” J. Berthelot, A. Bouhelier, C. Huang, J. Margueritat, G. Colas-des Francs, E. Finot, J.-C. Weeber, A. Dereux, S. Kostcheev, H. Ibn El Ahrach, A.-L. Baudrion, J. Plain, R. Bachelot, P. Royer, G. P. Wiederrecht, *Nano Letters* **9**, 3914 (2009).

“Control of Molecular Energy Redistribution Pathways via Surface Plasmon Gating,” G. P. Wiederrecht, J. E. Hall, A. Bouhelier, *Phys. Rev. Lett.* **98**, 083001 (2007).