

David Gosztola

Scientist

Nanophotonics & Biofunctional Structures Group

Center for Nanoscale Materials
Building 440, Room A23
Phone: 630-252-3541
Fax: 630-252-4646
E-mail: gosztola@anl.gov

Argonne National Laboratory
9700 S Cass Ave.,
Lemont, IL 60439



Education

Ph.D. Analytical Chemistry, Purdue University
B.Sc. Chemistry, Indiana University

Awards and honors

- Pacesetter Award, Argonne National Laboratory (2010)
- Pacesetter Award, Argonne National Laboratory (2002)
- R&D 100 Award (1993)
- Pacesetter Award, Argonne National Laboratory (1993)

Research interests

- Development of laser-based instrumentation for investigating the interaction of light with nanoscale materials.
- Ultrafast photochemistry, interfacial dynamics, electrochemistry, ultrafast laser-based instrumentation design.

Professional Experience

Argonne National Laboratory - Center for Nanoscale Materials (CNM) *2006-present*
Scientist

- Ultrafast dynamics and spectroscopy of nanomaterials
- Provide user support for suite of laser-based optical characterization tools.

Argonne National Laboratory - Radiation and Photochemistry Group *2000-2006*
Chemist

- Developed laser-driven picosecond electron beam and x-ray source for ultrafast pulsed radiolysis experiments.

Argonne National Laboratory –Molecular Photonics/Artificial Photosynthesis Group *1990-2000*
Postdoc, Assistant Chemist, Chemist

- Ultrafast photo induced electron transfer studies of biomimetic compounds.
- Developed regeneratively amplified femtosecond Ti:Sapphire laser system for transient absorbance.
- Developed solid-state tunable laser for resonance Raman measurements

Princeton University – Chemistry Department *1988-1990*
Postdoc, Assistant Chemist, Chemist

- Raman spectroscopy of heme-like molecules
- Development of fiber optic based spectrometer for simultaneous Raman and absorption measurements

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Selected Publications

Selected from 140+ publications:

1. "Mechanistic Insight of Photocatalysis using MIL-100(Fe)/TiO₂ Composites", X. He, H. Fang, **D. J. Gosztola**, Z. Jiang, P. Jena, and W.-N. Wang; *ACS Appl. Mater. Interfaces*, **2019**, 11(13), 12516-12524, doi: 10.1021/acsmi.9b00223.
2. "Ultrathin Transmissive Metasurfaces for Multiwavelength Optics in the Visible", H. Cai, D. Czaplewski, K. Ogando, A. Martinson, **D. Gosztola**, L. Stan, and D. López; *Appl. Phys. Lett.*, **2019**, 114, 071106; doi: 10.1063/1.5082557.
3. "Effects of Chlorine in Ash on the Corrosion Performance of Ni-based Alloys in Simulated Oxy-fuel Environment", Z. Zeng, K. Natesan, Z. Cai, and **D. Gosztola**; *Energy & Fuels*, **2018**, 32(10), 10502-10512; doi: 10.1021/acs.energyfuels.8b02233.
4. "η²-SO₂ Linkage Photo-isomer of an Osmium Coordination Complex", J. M. Cole, J. de J. Velazquez-Garcia, **D. J. Gosztola**, S.Y. Grass Wang, and Y.-S. Chen; *Inorg. Chem.*, **2018**, 57(5), 2673-2677; doi: 10.1021/acs.inorgchem.7b03032
5. "Life-time and Line-width of Individual Quantum Dots Interfaced with Graphene", X. Miao, **D. J. Gosztola**, A. V. Sumant, and H. Grebel; *Nanoscale*, **2018**, 10, 7040-7046; doi: 10.1039/C8NR01769G
6. "Probing the Impact of Solvation on Photoexcited Spin Crossover Complexes with High-precision X-ray Transient Absorption Spectroscopy", C. Liu, J. Zhang, L. Lawson Daku, **D. Gosztola**, S. Canton, and X. Zhang; *J. Am. Chem. Soc.*, **2017**, 139(48), 7518-17524; doi: 10.1021/jacs.7b09297.
7. "Anisotropic Scattering of Hot Electrons in an Ultra-Broadband Plasmonic Nanopatch Metasurface", M. Sykes, J. Stewart, G. Akselrod, X.-T. Kong, Z. Wang, **D. J. Gosztola**, A. B. F. Martinson, D. Rosenmann, M. H. Mikkelsen, A. O. Govorov, and G. P. Wiederrecht; *Nature Comm.*, **2017**, 8, 986; doi: 10.1038/s41467-017-01069-3.
8. "Enhanced Raman Scattering from NCM523 Cathodes Coated with Electrochemically Deposited Gold", A. Tornheim, V. A. Maroni, M. He, **D. J. Gosztola**, and Z. Zhang; *J. Electrochem. Soc.*, **2017**, 164(13), A3000; doi: 10.1149/2.0461713jes.
9. "Photon Upconversion Using Anti-Aromatic Naphtho-p-quinodimethane as a Light Harvesting Sensitizer", S. Shokri, G. Wiederrecht, **D. Gosztola**, and A. Ayitou; *J. Phys. Chem. C.*, **2017**, 121(42), 23377, doi: 10.1021/acs.jpcc.7b08373.
10. "Size-Dependent Biexciton Quantum Yields and Carrier Dynamics of Quasi-Two-Dimensional Nanoplatelets", X. Ma, B. Diroll, I. Fedin, R. Schaller, D. Talapin, S. Gray, G. Wiederrecht, and **D. Gosztola**; *ACS Nano*, **2017**, 11(9), 9119-9127, doi: 10.1021/acsnano.7b03943
11. "Photon-Induced Selenium Migration in TiSe₂", D. B. Lioi, **D. J. Gosztola**, G. P. Wiederrecht, and G. Karapetrov; *Appl. Phys. Lett.*, **2017**, 110(8), 081901; doi: 10.1063/1.4976745.
12. "Direct Experimental Evidence for Photoinduced Strong-Coupling Polarons in Organolead Halide Perovskite Nanoparticles", K. Zheng, M. Abdellah, Q. Zhu, Q. Kong, G. Jennings, C. A. Kurtz, M. E. Messing, Y. Niu, **D. Gosztola**, M. J. Al-Marri, X. Zhang, T. Pullerits, and S. E. Canton; *J. Phys. Chem. Lett.*, **2016**, 7(22), 4535-4539; doi: 10.1021/acs.jpcllett.6b02046.
13. "Ultrafast Optical Modulation of Second and Third Harmonic Generation from Cut-Disk-Based Metasurfaces", G. Sartorello, N. A. H. Olivier, G. Wurtz, J. Zhang, W. Yue, **D. J. Gosztola**, G. P. Wiederrecht, and A. V. Zayats; *ACS Photonics*, **2016**, 3(8), 1517-1522; doi: 10.1021/acsp Photonics.6b00108.

Patents

1. No. 10164188 *Polymer-Hybrid Electro-Optic Devices and Method of Fabricating Polymer-Hybrid Electro-Optic Devices*, L. E. Ocola, **D. J. Gosztola**, and A. I. Yanguas-Gil
2. No. 9548677 and 8,922,094 *Microelectromechanical (MEMS) Manipulators for Controlling Nanoparticle Coupling Interactions*. D. Lopez, G. Wiederrecht, **D. Gosztola**, and D. Mancini
3. No. 5,539,100 *Organic Solid State Switches Incorporating Porphyrin Compounds and Method for Producing Organic Solid State Optical Switches*. M. R. Wasielewski, G. L. Gaines III, M. P. Niemczyk, D. G. Johnson, **D. J. Gosztola**, and M. P. O'Neil