



**Dr. Yugang Sun**

*Scientist*

Theme: Nanophotonics

Phone: 630-252-3716

Fax: 630-252-4646

E-mail: ygsun@anl.gov

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

Ph.D., University of Science and  
Technology of China

**Research Summary:**

- Design and synthesis of functional nanostructures made of metals, semiconductors, oxides, and composites.
- Design and synthesis of low-cost and long-term stable plasmonic photocatalysts and non-supported catalysts for fuel conversion.
- Design and synthesis of CIGS nanoparticles for low-cost, high-performance photovoltaic devices.
- Investigation of their novel properties of the aforementioned structures in the context of optics, electronics, optoelectronics, magnetism, mechanics, catalysis, and energy storage/conversion.
- Development of technologies by integrating these structures with unconventional platforms (such as flexible substrates) for solar energy utilization, thin film and high capacity batteries, flexible electronics and sensors, and the 3<sup>rd</sup> generation lithium batteries.

**Awards:**

- Presidential Early Career Awards for Scientists and Engineers (PECASE), 2007
- DOE's Office of Science Early Career Scientist and Engineer Award, 2008

**Selected Recent Publications:**

- "Conversion of Ag Nanowires to AgCl Nanowires Decorated with Au Nanoparticles and Their Photocatalytic Activity", **Sun, Y.** *J. Phys. Chem. C* **2010**, *114*, 2127-2133.
- "Facile Synthesis of Sunlight-Driven Plasmonic AgCl:Ag Nanophotocatalysts", An, C.; Peng, S.; **Sun, Y.** *Adv. Mater.* (in press).
- "Synthesis of Ag Nanoplates on GaAs Wafers: Evidence for Growth Mechanism", **Sun, Y.** *J. Phys. Chem. C* **2010**, *114*, 857-863.

- “Metal Nanoplates on Semiconductor Substrates”, **Sun, Y.** *Adv. Funct. Mater.*, in press. (invited feature article)
- “Synthesis of Out-of-Substrate Au-Ag Nanoplates with Enhanced Stability for Catalysis”, **Sun, Y.**; Lei, C. *Angew. Chem. Int. Ed.* **2009**, *48*, 6824-6827.
- “Laser-Driven Growth of Silver Nanoplates on p-Type GaAs Substrates and Their Surface-Enhanced Raman Scattering Activity”, **Sun, Y.**; Pelton, M. *J. Phys. Chem. C* **2009**, *113*, 6061-6067.
- “Facile Tuning of Superhydrophobic States with Ag Nanoplates”, **Sun, Y.**; Qiao, R. *Nano Research* **2008**, *1(4)*, 292-302. (highlighted as back cover illustration)
- “Formation of Oxides and Their Role in the Growth of Ag Nanoplates on GaAs Substrates”,  
**Sun, Y.**; Lei, C.; Gosztola, D.; Haasch, R., *Langmuir*, **2008**, *24(20)*, 11928-11934.
- “Effects of Visible and Synchrotron X-Ray Radiation on the Growth of Silver Nanoplates on n-GaAs Wafers: A Comparative Study”, **Sun, Y.**; Yan, H.; Wu, X., *Appl. Phys. Lett.* **2008**, *92*, 183109.
- “Comparative Study on the Growth of Silver Nanoplates on GaAs Substrates by Electron Microscopy, Synchrotron X-Ray Diffraction, and Optical Spectroscopy”, **Sun, Y.**; Yan, H.; Wiederrecht, G. P., *J. Phys. Chem. C* **2008**, *112*, 8928-8938.
- “Single-Walled Carbon Nanotubes Modified with Pd Nanoparticles: Unique Building Blocks for High-Performance, Bendable Hydrogen Sensors”, **Sun, Y.**; Wang, H. H.; Xia, M. *J. Phys. Chem. C*, **2008**, *112*, 1250-1259.
- “Semiconductor Wires and Ribbons for High Performance Flexible Electronics”, Baca, A. J.; Ahn, J.-H.; **Sun, Y.**; Meitl, M. A.; Menard, E.; Kim, H.-S.; Choi, W. M.; Huang, Y.; Rogers, J. A. *Angew. Chem. Int. Ed.*, **2008**, *47*, 5524-5542. (invited review article)
- “Direct Growth of Dense, Pristine Metal Nanoplates on Semiconductor Substrates”, **Sun, Y.** *Chem. Mater.* **2007**, *19*, 5845-5847.
- “Surfactantless Synthesis of Silver Nanoplates with Rough Surfaces and Their Application in SERS”, **Sun, Y.**, Wiederrecht, G. P. *Small* **2007**, *3*, 1964-1975. (highlighted with cover illustration)
- “Electrodeposition of Pd Nanoparticles on Single-Walled Carbon Nanotubes for Flexible Hydrogen Sensors”, **Sun, Y.**; Wang, H. H. *Appl. Phys. Lett.* **2007**, *90*, 213107.
- “High-Performance, Flexible Hydrogen Sensors That Use Carbon Nanotubes Decorated with Palladium Nanoparticles”, **Sun, Y.**; Wang, H. H. *Adv. Mater.* **2007**, *19*, 2818-2823.
- “Structural Forms of Single Crystal Semiconductor Nanoribbons for High-Performance Stretchable Electronics”, **Sun, Y.**; Rogers, J. A. *J. Mater. Chem.* **2007**, *17*, 832-840. (invited feature article and highlighted with cover illustration)
- “Inorganic Semiconductors for Flexible Electronics”, **Sun, Y.**; Rogers, J. A. *Adv. Mater.* **2007**, *19*, 1897-1916. (invited review article)