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Research Summary:

- Design and synthesis/fabrication of functional nanostructures made of metals, semiconductors, oxides, and their hybrids/composites.
- Design and synthesis/fabrication of low-cost and long-term stable plasmonic photocatalysts. Investigation of their novel properties of the aforementioned structures in the context of optics, electronics, optoelectronics, magnetism, mechanics, 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.

Selected Recent Publications:

"Facile Tuning of Superhydrophobic States with Ag Nanoplates", **Sun, Y.**; Qiao, R., Nano Research, **2008**, 1(4), 292-302.

"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.

"Temperature-dependence of epitaxial graphene formation on SiC(0001)", Shu Nie, L.; Fisher, P. J.; Feenstra, R. M.; Gu, G.; **Sun, Y.** J. Electronic Mater., published online, DOI: 10.1007/s11664-008-0584-3.

"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.

"Carbon Nanotube-Based Flexible Electronics and Sensors", Sun, X.; **Sun, Y.** J. Mater. Sci. Technol., **2008**, 24, 569-577. (invited review article)

"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.

"Post-buckling Analysis for the Precisely Controlled Buckling of Thin Film Encapsulated by Elastomeric Substrates", Jiang, H.; **Sun, Y.**; Rogers, J. A.; Huang, Y. International Journal of Solids and Structures, **2008**, 45, 2014-2023.

"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)

Books and Book Chapters

"Nanoscale Testing of One-Dimensional Nanostructure", Peng, B.; **Sun, Y.**; Zhu, Y.; Wang, H.-H.; Espinosa, H. D., in Micro and Nano Mechanical Testing of Materials and Devices, (Ed: F. Yang and James C. M. Li), Springer Science+Business Media, LLC, Ch. 11, pp. 287-311. **(2008)**

Comprehensive Nano Science and Technology, Volume 6, **Sun, Y.** (Advisory Editor), Elsevier.

Flexible Devices Made of Semiconductor Nanostructures, Ed. By **Sun, Y.**; Rogers, J. A., William Andrew Publishing (2008).

"One-Dimensional Semiconductor Nanostructures for High-Performance, Flexible Electronics and Sensors", **Sun, Y.**, in Functional Nanomaterials: A Chemistry and Engineering Perspective, (Ed: Chen, S. and Lin W.), The Press of the University of Science and Technology of China, Hefei, China. **(2008)**