

# DONG YU

## Professional Preparation:

Univ. of Sci. & Tech. of China (USTC)	Materials Science	B.Sc.	2000
University of Chicago	Physics	Ph.D.	2005
Harvard University	Physics	Postdoc	2005-2008

## Appointments:

7/2014-Current: Associate Professor, Physics Department, U. C. Davis

7/2008-6/2014: Assistant Professor, Physics Department, U. C. Davis

## Research Interest:

Synthesis and experimental investigation of structural, electronic, and transport properties of semiconductor nanostructured materials, including nanostructures grown by chemical vapor deposition and colloidal nanocrystals. Topics include: scanning photocurrent microscopy, quantum confinement effect, nanostructure solar cells, diluted magnetic semiconductors, metal insulator phase transition, phase change memory, and topological insulators.

## Publications:

23. Yang, Y., Peng, X., **Yu, D.**, High intensity induced photocurrent polarity switching in lead sulfide nanowire field effect transistors. *Nanotechnology*, **25**, 195202 (2014). ([pdf](#))
22. Yang, Y., Peng, X., **Yu, D.**, Spatially Resolved Optoelectronics in Lead Sulfide Nanowires. *ECS Transactions*, **58**, 87 (2013). ([pdf](#))
21. Graham, R., **Yu, D.**, Scanning Photocurrent Microscopy In Semiconductor Nanostructures. *Modern Physics Letters B*, **27**, 1330018 (2013). (invited review [pdf](#))
20. Otto, T., Miller, C., Tolentino, J., Liu, Y., Law, M., and **Yu, D.**, Gate-Dependent Carrier Diffusion Length in Lead Selenide Quantum Dot Field-Effect Transistors. *Nano Lett.*, **13**, 3463 (2013). ([pdf](#))
19. Otto, T., and **Yu, D.**, Positive Temperature Coefficient of Resistance and Bistable Conduction in Lead Selenide Quantum Dot Thin Films. *J. Phys. Chem. C.*, **117**, 3713 (2013). ([pdf](#))
18. Yang, Y., Li, J., Wu, H., Oh, E., and **Yu, D.**, Controlled Ambipolar Doping and Gate Voltage Dependent Carrier Diffusion Length in Lead Sulfide Nanowires. *Nano Lett.*, **12**, 5890 (2012). ([pdf](#))
17. Graham, R. and **Yu, D.**, High Carrier Mobility in Single Ultrathin Colloidal Lead Selenide Nanowire Field Effect Transistors. *Nano Lett.*, **12**, 4360 (2012). ([pdf](#))
16. Wu, H., Yang, Y., Oh, E., Lai, F., and **Yu, D.**, Direct Synthesis of High-density Lead Sulfide Nanowires on Metal Thin Films Towards Efficient Infrared Light Conversion. *Nanotechnology*, **23**, 265602 (2012). ([pdf](#))
15. Isheim, D., Kaszpirenko, J., **Yu, D.**, Mao, Z., Seidman, D., and Arslan, I., 3-D Atomic-Scale Mapping of Manganese Dopants in Lead Sulfide Nanowires. *J. Phys. Chem. C*, **116**, 6595 (2012). ([pdf](#))

14. Miller, C., Triplett, M., Lammatao, J., Suh, J., Fu, D., Wu J., & **Yu, D.** Unusually long free carrier lifetime and metal-insulator band offset in vanadium dioxide. *Phys. Rev. B*, **85**, 085111 (2012). ([pdf](#))
13. Fu, D., Zou, J., Wang, K., Zhang, R., **Yu, D.**, & Wu, J. Electrothermal dynamics of semiconductor nanowires under local carrier modulation. *Nano Lett.*, **11**(9), 3809 (2011). ([pdf](#))
12. Graham, R., Miller, C., Triplett, M., & **Yu, D.** Scanning photocurrent microscopy in single nanowire devices. *Proc. of SPIE*, 8106, 81060K (2011) (Invited paper). ([pdf](#))
11. Graham, R., Miller, C., Oh, E., & **Yu, D.** Electric Field dependent photocurrent decay length in single lead sulfide nanowire field effect transistors. *Nano Lett.*, **11**, 717 (2011). ([pdf](#))
10. **Yu, D.**, Brittman, S., Lee, J., Falk, A. L. & Park, H. Minimum voltage for threshold switching in nanoscale phase-change memory. *Nano Lett.* **8**, 3429 (2008). ([pdf](#))
9. Lee, J., Brittman, S., **Yu, D.** & Park, H. Vapor-liquid-solid and vapor-solid growth of phase-change Sb<sub>2</sub>Te<sub>3</sub> nanowires and Sb<sub>2</sub>Te<sub>3</sub>/GeTe nanowire heterostructures. *J. Am. Chem. Soc.* **130**, 6252 (2008). ([pdf](#))
8. Guyot-Sionnest, P., **Yu, D.**, Jiang, P. H. & Kang, W. Spin blockade in the conduction of colloidal CdSe nanocrystal films. *J. Chem. Phys.* **127**, 014702 (2007). ([pdf](#))
7. **Yu, D.**, Wu, J., Gu, Q. & Park, H. Germanium telluride nanowires and nanohelices with memory-switching behavior. *J. Am. Chem. Soc.* **128**, 8148 (2006). ([pdf](#))
6. **Yu, D.**, Wehrenberg, B. L., Jha, P., Ma, J. & Guyot-Sionnest, P. Electronic transport of n-type CdSe quantum dot films: Effect of film treatment. *J. Appl. Phys.* **99**, 104315 (2006). ([pdf](#))
5. **Yu, D.**, Wehrenberg, B. L., Yang, I., Kang, W. & Guyot-Sionnest, P. Magnetoresistance of n-type quantum dot solids. *Appl. Phys. Lett.* **88**, 072504 (2006). ([pdf](#))
4. Guyot-Sionnest, P., Wehrenberg, B. & **Yu, D.** Intraband relaxation in CdSe nanocrystals and the strong influence of the surface ligands. *J. Chem. Phys.* **123**, 074709 (2005). ([pdf](#))
3. Wehrenberg, B. L., **Yu, D.**, Ma, J. S. & Guyot-Sionnest, P. Conduction in charged PbSe nanocrystal films. *J. Phys. Chem. B* **109**, 20192 (2005). ([pdf](#))
2. **Yu, D.**, Wang, C. J., Wehrenberg, B. L. & Guyot-Sionnest, P. Variable range hopping conduction in semiconductor nanocrystal solids. *Phys. Rev. Lett.* **92**, 216802 (2004). ([pdf](#))
1. **Yu, D.**, Wang, C. & Guyot-Sionnest, P. n-type conducting CdSe nanocrystal solids. *Science* **300**, 1277 (2003). ([pdf](#))

### Synergistic Activities:

- Peer reviewer for several scientific journals, including Nature Communication, Nano Letters, Nanotechnology, Journal of Physics: Condensed Matter, Journal of Physics D: Applied Physics, Semiconductor Science and Technology, Journal of American Chemical Society, and Journal of Physical Chemistry.
- Peer reviewer for Proposal Study Panel (PSP) for user proposals to The Molecular Foundry (TMF) at Lawrence Berkeley National Laboratory (LBNL). Member of the User Executive Committee (UEM) and organized the Annual User Meeting (AUM) at TMF.
- Review panelist for National Science Foundation (NSF).
- Co-chair of Energy Institute Seminars, U.C. Davis, Spring 2012

### **Awards and Honors:**

2010 Hellman Fellowship, University of California, Davis

2005 Second Prize, James Frank Institute Annual Symposium, University of Chicago

2001 Robert G. Sachs Fellowship, University of Chicago

1999 Guo Moruo Prize, USTC

### **Conference List**

1. 2013, **224th ECS meeting**, San Francisco, CA, **Invited talk**, “Spatially Resolved Optoelectronics in Lead Sulfide Nanowires.”
2. 2013, **2nd U. C. Davis Nanjing University Workshop on Condensed Matter Physics**, Nanjing University, China, **Invited talk**, “Scanning photocurrent microscopy for single nanowires characterization”.
3. 2013, **Annual Workshop of the 10+10 Alliance**, UC. Davis, CA, **Invited talk**, “Spatially resolved optoelectronics in semiconductor nanowires and quantum dots”.
4. 2012, **The Molecular Foundry Seminar**, Berkeley, CA, **Invited talk**, “Scanning photocurrent microscopy for understanding charge transport in semiconductor nanowires and quantum dots”.
5. 2012, **1st U. C. Davis Nanjing University Workshop on Condensed Matter Physics**, Davis, CA, **Invited talk**, “Scanning photocurrent microscopy for single nanowires characterization”.
6. 2011, **SPIE NanoScience + Engineering**, San Diego, CA, **Invited talk**, “Scanning photocurrent microscopy in single nanowire devices”.
7. 2011, **American Physical Society March Meeting**, Dallas, TX, Contributed talk, “Electric Field Dependent Photocurrent Decay Length in Single Lead Sulfide Nanowire Field Effect Transistors”.
8. 2011, **California State University – Sacramento**, Sacramento, CA, Invited talk, “Nanostructure Solar Cell”.
9. 2010, **Transport in Nanoengineered Materials Workshop**, Univ. of Chicago, Poster, “Photocurrent imaging in single PbS nanowire field effect transistors”.
10. 2010, **Energy for the Future Symposium**, UC. Davis, CA, **Invited talk**, “Nanostructure solar cells: From single nanowire characterization to device integration”.
11. 2010, **Materials Research Society Meeting**, San Francisco, CA, **Invited talk**, “Minimum Voltage for Threshold Switching in Nanoscale Phase-change Memory”.
12. 2010, **American Physical Society March Meeting**, Portland, OR, Contributed talk, “Optoelectronic characterization of single PbS nanowire field effect transistors”.

13. 2009, **University of Chicago**, Chicago, IL, **Invited talk**, “Phase change and photovoltaic at the nanoscale”.
14. 2009, **Second Annual Workshop of the 10+10 Alliance**, UC. Davis, CA, **Invited talk**, “Semiconductor nanowires for solar energy collection”.
15. 2006, **Gordon Research Conference**, Tilton, NH, Poster, “Germanium telluride nanowires and nanohelices with memory-switching behavior”.
16. 2005, **American Physical Society March Meeting**, Los Angeles, CA, Contributed talk, “Variable range hopping, photoconductivity and magnetoresistance of n-type semiconductor nanocrystal solids”.
17. 2004, **Midwest Solid State Conference**, Purdue University, West Lafayette, IN, Poster, “Variable range hopping of n-type semiconductor nanocrystal solids”.
18. 2003, **Materials Research Society Meeting**, Boston, MA, Contributed talk, “Electron transport of n-type semiconductor nanocrystal thin films”.