

# RENJIA ZHOU

The Molecular Foundry  
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## EDUCATION

- **Ph.D. in Material Science & Engineering**, University of Florida, Gainesville, FL, USA Dec. 2012  
Dissertation: Organic-inorganic hybrid photovoltaic cells; Advisor: Prof. Jiangeng Xue
- **M.S. in Chemistry**, Zhejiang University, Hangzhou, China Jun. 2008  
Thesis: Synthesis and optical properties of gold nanocrystals and their hybrids, Advisor: Prof. Hongzheng Chen
- **B.S. in Polymer Science & Engineering**, Zhejiang University, Hangzhou, China Jun. 2006

## RESEARCH INTEREST

- Colloidal nanocrystals: chemistry and application in optoelectronic devices including photovoltaics, electrochromic devices, light-emitting diodes, and photodetectors
- Organic and organic-inorganic hybrid photovoltaic cells, light-emitting diodes, and photodetectors

## RESEARCH EXPERIENCE

**Postdoc associate**, Lawrence Berkeley National Laboratory, 2013 -

- Colloidal nanocrystals in glass for electrochromic devices

**Ph.D. research assistant**, University of Florida, 2008 – 2012

- Organic-inorganic hybrid, organic, and quantum dots solar cells
- Synthesis and characterization of colloidal nanocrystals with variable sizes, shapes, and surface chemistry
- Quantum dots / organic light-emitting diodes

**M.S. research assistant**, Zhejiang University, 2006 – 2008

- Synthesis and optical properties study of gold nanocrystals
- Synthesis and characterization of carbon nanotube / polymers supermolecules

**B.S. research assistant**, Zhejiang University, 2005 – 2006

- Synthesis and characterization of organic-inorganic hybrid perovskite materials

## PUBLICATIONS

(Published **20** peer-reviewed papers, total citations: **>280**, and h-index: **12**.)

- **Renjia Zhou**, Romain Stalder, Dongping Xie, Ying Zheng, Weiran Cao, Yixing Yang, Marc Plaisant, Kirk S. Schanze, Paul H. Holloway, John R. Reynolds, Jiangeng Xue, "Enhancing the efficiency of solution-processed polymer:colloidal

nanocrystal hybrid photovoltaic cells via interface engineering”, *ACS Nano*, in revision 2012.

- Romain Stadler, Dongping Xie, **Renjia Zhou**, Jiangeng Xue, Kirk S. Schanze, and John R. Reynolds, “Variable-gap conjugated oligomers grafted to CdSe nanocrystals”, *Chemistry of Materials*, **2012**, 24, 3143.
- **Renjia Zhou**, and Jiangeng Xue, “Hybrid polymer:nanocrystal materials for photovoltaic applications”, *ChemPhysChem*, **2012**, 13, 2471.
- **Renjia Zhou**, Ying Zheng, Lei Qian, Yixing Yang, Paul Holloway, Jiangeng Xue, “Solution-processed, nanostructured hybrid organic-inorganic solar cells with broad spectral sensitivity”, *Nanoscale*, **2012**, 4, 3507.
- Jason D. Myers, Weiran Cao, Vincent Cassidy, Sang-Hyun Eom, **Renjia Zhou**, Liqiang Yang, Wei You, and Jiangeng Xue, “A universal optical approach to enhanced efficiency in organic-based photovoltaic devices”, *Energy & Environmental Science*, **2012**, 5, 6900.
- Jihua Yang, Lei Qian, **Renjia Zhou**, Aiwei Tang, Paul Holloway, and Jiangeng Xue, “Efficient and air-stable hybrid inorganic/organic solar cells with a ZnO nanocrystals buffer layer”, *Journal of Applied Physics*, **2012**, 111, 044323.
- O. M. Ntwaeaborwa, **Renjia Zhou**, Lei Qian, Shreyas S. Pitale, J. Xue, H. C. Swart, P. H. Holloway, “Post-fabrication annealing effects on the performance of P3HT:PCBM solar cells with/without ZnO nanoparticles”, *Physica B*, **2012**, 407, 1631.
- Lei Qian, Jihua Yang, **Renjia Zhou**, Aiwei Tang, Ying Zheng, Tengkuang Tseng, Bebasis Bera, Jiangeng Xue, Paul Holloway, “Hybrid Polymer-CdSe Solar Cells with a ZnO Nanoparticle Buffer Layer for Improved Efficiency and Lifetime”, *Journal of Materials Chemistry*, **2011**, 21, 3814.
- Jihua Yang, Aiwei Tang, **Renjia Zhou**, Jiangeng Xue, “Effects of nanocrystal size and device aging on performance of hybrid poly(3-hexylthiophene):CdSe nanocrystal solar cells”, *Solar Energy Materials and Solar Cells*, **2011**, 95, 476.
- Xi Yang, Minmin Shi, **Renjia Zhou**, Xiaoqiang Chen, and Hongzheng Chen, “Blending of H<sub>2</sub>AuCl<sub>4</sub> with histidine in aqueous solution: a simple approach to the Au<sub>10</sub> clusters”, *Nanoscale*, **2011**, 3, 2596.
- Chaohua Xue, **Renjia Zhou**, Minmin Shi, Gang Wu, Xiaobin Zhang, Mang Wang, Hongzheng Chen, “Electrochemistry of glucose oxidase immobilized on carbon nanotubes noncovalently functionalized by multihydroxyl and multicarboxyl groups”, *Journal of Electroanalytical Chemistry*, **2010**, 642, 92.
- **Renjia Zhou**, Minmin Shi, Xiaoqiang Chen, Mang Wang, and Hongzheng Chen, “Atomically monodispersed and fluorescent sub-nanometer gold clusters created by biomolecules-assisted etching of nanometer-sized gold particles and rods”, *Chemistry – A European Journal*, **2009**, 15, 4944.
- Yan Gao, Minmin Shi, **Renjia Zhou**, Chaohua Xue, Mang Wang, Hongzheng Chen, “Solvent-dependent fluorescence property of multi-walled carbon nanotubes noncovalently functionalized by pyrene-derivated polymer”, *Nanotechnology*, **2009**, 20, 135705.
- Bo Ding, Minmin Shi, Fei Chen, **Renjia Zhou**, Meng Deng, Mang Wang, Hongzheng Chen, “Shape-controlled syntheses of PbS submicro-/nano-crystals via hydrothermal method”, *Journal of Crystal Growth*, **2009**, 311, 1533.
- Fei Chen, **Renjia Zhou**, Ligong Yang, Minmin Shi, Gang Wu, Mang Wang, Hongzheng Chen, “One-step fabrication of CdS nanorod arrays via solution chemistry”, *Journal of Physical Chemistry C*, **2008**, 112, 13457.
- Fei Chen, **Renjia Zhou**, Ligong Yang, Nan Liu, Mang Wang, and Hongzheng Chen, “Large-Scale and Shape-Controlled Syntheses of Three-Dimensional CdS Nanocrystals with Flower-Like Structure”, *Journal of Physical Chemistry C*, **2008**, 112, 1001.
- Ru Bai, Mi Ouyang, **Renjia Zhou**, Minmin Shi, Mang Wang, Hongzheng Chen, “Well-defined nanoarrays from an n-type organic perylene-diimide derivative for photoconductive devices”, *Nanotechnology*, **2008**, 19, 055604.
- Chaohua Xue, **Renjia Zhou**, Minmin Shi, Yan Gao, Gang Wu, Xiaobin Zhang, Hongzheng Chen, Mang Wang, “The preparation of highly water-soluble multi-walled carbon nanotubes by irreversible noncovalent functionalization with a pyrene-carrying polymer”, *Nanotechnology*, **2008**, 19, 215604.

- Chaohua Xue, **Renjia Zhou**, Minmin Shi, Yan Gao, Gang Wu, Xiaobin Zhang, Hongzheng Chen, Mang Wang, “A green route to water soluble carbon nanotubes and in situ loading of silver nanoparticles”, *Nanotechnology*, **2008**, 19, 325605.
- **Renjia Zhou**, Minmin Shi, Xiaoqiang Chen, Mang Wang, Yang Yang, Xiaobin Zhang and Hongzheng Chen, Water-Soluble and Highly-Fluorescent Hybrids of Multi-Walled Carbon Nanotubes with Uniformly Arranged Gold Nanoparticles, *Nanotechnology*, **2007**, 18, 485603.
- Zelong Xiao, Hongzheng Chen, Minmin Shi, Gang Wu, **Renjia Zhou**, Zhisheng Yang, Mang Wang, Benzong Tang, “Preparation and characterization of organic-inorganic hybrid perovskite (C<sub>4</sub>H<sub>9</sub>NH<sub>3</sub>)<sub>2</sub>CuCl<sub>2</sub>”, *Materials Science and Engineering B*, **2005**, 117, 313.

## CONFERENCE PRESENTATIONS

- (Invited) Jiangeng Xue\*, **Renjia Zhou**, and Paul H. Holloway, “Organic-inorganic Hybrid Materials for Photovoltaic Applications”, AVS national meeting, Invited talk, Tampa, Oct. 2012.
- (Invited) Jiangeng Xue\*, **Renjia Zhou**, and Paul H. Holloway, “Organic-inorganic Hybrid Materials for Photovoltaic Applications”, *IUMRS-International Conference on Electronic Materials (IUMRS-ICEM 2012)*, Invited talk, Pacifico Yokohama, Yokohama, Japan, Sept. 2012.
- (Invited) **Renjia Zhou**, \* Ying Zheng, Lei Qian, Paul H. Holloway, and Jiangeng Xue, “High-efficiency, Solution-processed Hybrid Organic-inorganic Photovoltaic Cells”, *Annual Joint Symposium of the FLAVS and FSM*, Invited talk for young leaders section, Orlando, Mar. 2012.
- (Invited) **Renjia Zhou**, \* Ying Zheng, Lei Qian, Paul H. Holloway, and Jiangeng Xue, “High-efficiency, Solution-processed Hybrid Polymer:Colloidal Nanocrystal Photovoltaic Cells”, *Global Organic Photovoltaics*, Invited talk, Hangzhou, Oct. 2011.
- **Renjia Zhou**,\* Ying Zheng, Dongping Xie, Weiran Cao, Yixing Yang, Romain Stalder, Marc Plaisant, Kirk S. Schanze, Paul H. Holloway, John R. Reynolds, and Jiangeng Xue, “High-efficiency solution-processed hybrid polymer:colloidal nanocrystals photovoltaic cells”, *SPIE Optics & Photonics*, Oral, San Diego, Aug. 2011.
- Ying Zheng,\* Lei Qian, **Renjia Zhou**, Paul H. Holloway, Jiangeng Xue, “All-inorganic quantum-dot light-emitting diodes with metal oxide as charge transport/injection layers”, *SPIE Optics & Photonics*, Oral, San Diego, Aug. 2011.
- **Renjia Zhou**,\* Ying Zheng, Dongping Xie, Weiran Cao, Yixing Yang, Romain Stalder, Marc Plaisant, Kirk S. Schanze, Paul H. Holloway, John R. Reynolds, and Jiangeng Xue, “5% efficient hybrid organic-inorganic solar cells based on blends of CdSe nanorods and conjugated polymers”, *Annual Joint Symposium of the FLAVS and FSM*, Poster, Orlando, Mar. 2011.
- **Renjia Zhou**, Lei Qian, Ying Zheng, Paul H. Holloway, and Jiangeng Xue\*, “Efficient and Air-stable Hybrid Organic-Inorganic Photovoltaic Cells”, *SPIE Optics & Photonics*, Oral presentation, San Diego, Aug. 2010.
- **Renjia Zhou**,\* Qian Lei, Ying Zheng, Paul Holloway, Jiangeng Xue, Efficient and air-stable hybrid organic-inorganic photovoltaic cells. *The 9<sup>th</sup> International Symposium on Functional  $\pi$ -Electron Systems (F- $\pi$ -9)*, Poster, Atlanta, May 2010.
- (Invited) Jiangeng Xue,\* **Renjia Zhou**, Lei Qian, Ying Zheng, Jihua Yang, Aiwei Tang, Paul H. Holloway, Hybrid Photovoltaic Cells based on Conjugated Polymers and CdSe Nanoparticles, *The International Conference on Nanophotonics*, Invited talk, Epocal Tsukuba, Japan, May 2010.
- **Renjia Zhou**,\* Lei Qian, Ying Zheng, Paul Holloway, Jiangeng Xue, Efficient and air-stable hybrid organic-inorganic solar cells based on a low-gap polymer and CdSe nanoparticles. *Annual Joint Symposium of the FLAVS and FSM*, Poster, Orlando, Mar. 2010.
- Jihua Yang, Lei Qian, **Renjia Zhou**,\* Aiwei Tang, Paul Holloway, Jiangeng Xue, Improving the efficiency and air stability of hybrid P3HT/CdSe solar cells with a ZnO buffer layer. *MRS Fall Meeting*, Oral, Boston, Dec. 2009.
- Jihua Yang, Aiwei Tang, **Renjia Zhou**,\* Jiangeng Xue, Hybrid P3HT/CdSe photovoltaic cells: effects of nanocrystal size and device aging. *MRS Fall Meeting*, Poster, Boston, Dec. 2009.

- **Renjia Zhou**,\* Mang Wang, Hongzheng Chen, In-situ Fabrication of Highly-Fluorescent Nanohybrids Based on Carbon Nanotubes and Gold Nanoparticles, *the Asia Optical Fiber Communication & Optoelectronic Exposition & Conference*, Oral, Shanghai, China, Oct. 2007.

## PATENTS

- 1 China patent issued and 2 pending.

## PROFESSIONAL ACTIVITIES

- **Membership:**

Materials Research Society (MRS)

International Society for Optics and Photonics (SPIE)

American Vacuum Society (AVS)

- **Paper reviewer:**

Journal of Nanoscience and Nanotechnology

MRS proceedings