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EDUCATION

- **University of California, Berkeley** Berkeley, USA
Ph.D. in Chemistry *Aug. 2012 – Dec. 2017*
- **Zhejiang University** Hangzhou, China
Bachelor of Science in Polymer Science and Engineering *Aug. 2008 – May. 2012*

PROFESSIONAL SUMMARY

- **New York University**
Center of Soft Matter Research, Department of Physics *Mar. 2018 – Present*
Postdoctoral Associate Advisor: Prof. David Pine
 - Developed a comprehensive view of microscopic interactions between DNA-coated colloids, through a combination of polymer colloids synthesis, optical experiments, and numerical modeling.
 - Designed and constructed a photon-shot-noise-limited total internal reflection microscope (TIRM) for probing *in situ* single-particle dynamics with nanometer-scale resolution.
 - DNA-directed assembly of shaped metal/dielectric nanoparticles and *in situ* beamline X-ray characterizations (in collaboration with BNL Beamline)
- **University of California, Berkeley**
Department of Chemistry *Aug. 2012 – Dec. 2017*
Graduate Student Researcher Advisor: Prof. Peidong Yang
 - Developed silane-based chemistry to synthesize a family of ultrathin (i.e. diameter < 20 nm) metal nanowires with surface passivation. Demonstrated promising applications as low-haze, high-conductivity, and oxidation-resistant transparent conductors. 4 international patents together with BASF Inc.
 - Nano-engineering of copper-based catalysts towards carbon neutralization. Achieved efficient electrochemical reduction of CO₂ towards hydrocarbon products with high selectivity.
 - Developed large-scale, low-cost colloidal syntheses of semiconductor nanowires (silicon, and III-V) for photoelectrochemistry (PEC).
- **Zhejiang University**
Department of Chemistry *May 2010 – May 2012*
Undergraduate Student Researcher Advisor: Prof. Xiaogang Peng & Jian Ji
 - Synthesized CdSe/CdS core/shell nanocrystals with controlled Zinc Blende or Wurtzite crystal structures.
 - Bio-modification of gold nanocarriers for drug delivery

PUBLICATIONS (* INDICATES EQUAL CONTRIBUTION)

- [1] **Cui, F.***, Marbach, S.*, Zheng, J., M. Holmes-Cerfon, M. & Pine, D. Comprehensive view of nanoscale interactions between DNA-coated colloids. *Nat. Commun.* **13**, 2304, (2022). (**Featured in Nature Communications Editors' Highlights**)
- [2] **Cui, F.** & Pine, D. Effect of photon counting shot noise on total internal reflection microscope. *Soft Matter* **18**, 162 (2022).
- [3] Liu, Y., Siron, M., Lu, D., Dos Reis, R., **Cui, F.**, Gao, M., Lai, M., Lin, J., Kong, Q., Lei, T., Kang, J., Jin, J., Ciston, J. & Yang, P. Self-assembly of two-dimensional perovskite nanosheet building blocks into ordered Ruddlesden–Popper perovskite phase. *J. Am. Chem. Soc.* **141**, 13028 (2019).
- [4] Niu, Z.*, **Cui, F.***, Kuttner, E., Xie, C., Chen, H., Sun, Y., Dehestani, A., Schierle-Arndt, k. & Yang, P. Synthesis of silver nanowires with reduced diameters using benzoin-derived radicals to make transparent conductors with high transparency and low haze. *Nano Lett.* **18**, 5329 (2018).
- [5] Lin, J.*, Lai, M.*, Dou, L., Kley, C. S., Chen, H., Peng, F., Sun, J., Lu, D., Hawks, S. A., Xie, C., **Cui, F.**, Alivisatos, A. P., Limmer, D. & Yang, P. Thermochromic halide perovskite solar cells. *Nat. Mater.* **17**, 261 (2018).
- [6] Niu, Z.*, **Cui, F.***, Yu, Y., Becknell, N., Sun, Y., Khanarian, G., Kim, D., Dou, L., Dehestani, A., Schierle-Arndt, K., & Yang, P. Ultrathin epitaxial Cu@Au core-shell nanowires for stable transparent conductors. *J. Am. Chem. Soc.* **139**, 7348 (2017).
- [7] **Cui, F.**, Dou, L., Yang, Q., Yu, Y., Niu, Z., Sun, Y., Liu, H., Dehestani, A., Schierle-Arndt, K., & Yang, P. Benzoin radicals as reducing agent for synthesizing ultrathin copper nanowires. *J. Am. Chem. Soc.* **139**, 3027 (2017).
- [8] Li, Y.*, **Cui, F.***, Ross, M., Kim, D., Sun, Y., & Yang, P. Structure-sensitive CO₂ electroreduction to hydrocarbons on ultrathin five-fold twinned copper nanowires. *Nano Lett.* **17**, 1312 (2017).
- [9] Y. Yu, **F. Cui**, J. Sun, P. Yang, Atomic structure of ultrathin gold nanowires. *Nano Lett.* **16**, 3078 (2016).
- [10] Dou, L.*, **Cui, F.***, Yu, Y., Khanarian, G., Eaton, S., Yang, Q., Resasco, J., Schildknecht, C., Schierle, K. & Yang, P. Solution processed copper reduced-graphene-oxide core-shell nanowire transparent conductors. *ACS Nano* **10**, 2600 (2016).
- [11] Sun, J.*, **Cui, F.***, Kisielowski, C., Yu, Y., Kornienko, N. & Yang, P. Low-temperature solution-phase growth of silicon and new silicon-containing alloy nanowires. *J. Phys. Chem.* **120**, 20525 (2016).
- [12] **Cui, F.**, Yu, Y., Dou, L., Sun, Yang, Q., Schildknecht, C., Schierle-Arndt, K. & Yang, P. Synthesis of ultrathin copper nanowires using tris(trimethylsilyl)silane for highperformance and low-haze transparent conductors. *Nano Lett.* **15**, 7610 (2015).
- [13] Nan, W., Niu, Y., Qin, H., **Cui, F.**, Yang, Y., Lai, R., Lin, W. & Peng, X. Crystal structure control of zinc-blende CdSe/CdS core/shell nanocrystals: synthesis and structure-dependent optical properties. *J. Am. Chem. Soc.* **134**, 19685 (2012).

PATENTS

- [1] Yang, P., Niu, Z. & **Cui, F.** Conductive Core-Shell Metal Nanowires for Transparent Conductors, WO2018140226. Publish date: Aug. 02, 2018.
- [2] Yang, P., **Cui, F.** & Dou, L. Synthesis of Ultra-Thin Metal Nanowires Using Organic Free Radicals, WO2017210026. Publish date: Dec. 07, 2017.

- [3] Yang, P., Dou, L. & **Cui, F.** Transparent conductors, WO2017048923A1. Publish date: Mar. 23, 2017.
- [4] Yang, P., Sun, J., Yu, Y. & **Cui, F.** Methods to produce ultra-thin metal nanowires for transparent conductors, WO2016049430. Publish date: Mar. 31, 2016.

PRESENTATIONS

- [1] **Cui, F.**, Marbach, S., Zheng, J., M. Holmes-Cerfon, M. & Pine, Probing nanoscale interactions between DNA-coated colloids using total internal reflection microscopy, APS March Meeting, 2022, Chicago, Illinois.
- [2] **Cui, F.**, Yang, P., Dou, L., Niu, Z. & Yu, Y. Ultrathin core shell nanowires for high-performance transparent conductors - from synthesis to application, 253rd ACS National Meeting, April, 2017, San Francisco, California.
- [3] **Cui, F.**, Yang, P., Dou, L., Yu, Y., Eaton, S. & Khanarian, G. High-Performance Copper Based Nanowire Transparent Electrodes for Flexible Thin Film Electronics, MRS Spring Meeting, April, 2017, Phoenix, Arizona.
- [4] **Cui, F.**, Ultra-thin copper-based nanowires for transparent conductors, 2nd CARA Annual Meeting, April, 2016, Berkeley, California
- [5] **Cui, F.**, "Solution Synthesized InP Nanowire Array for Photoelectrochemistry" Graduate Student Conference, March, 2013, Berkeley, California

HONORS AND AWARDS

- Outstanding Chinese Students Abroad, 2018.
- Finalist for Best Poster, Material Research Society Spring Meeting, 2017.
- National Scholarship Award, Zhejiang University, 2012.
- Outstanding Undergraduate Student Award (First-Class), Zhejiang University, 2011.

TEACHING AND MENTORING

- **Teaching Experience:**

- Teaching Assistant, Department of Chemistry, University of California, Berkeley
 - Advanced Inorganic Chemistry (Chem 4A) Spring, 2014
 - General Chemistry (Chem 1A) Fall, 2013
 - General Chemistry Lab (Chem 1ALab) Fall, 2012
- Teaching Assistant, Department of Chemistry, Zhejiang University
 - Organic Chemistry Spring, 2012
 - Physical Chemistry (Chem 1A) Fall, 2011

- **Mentoring Experience:**

- Mentored three Ph.D. students and two undergraduate students on research directions, scientific writing and presentations, and equipment training.

PROFESSIONAL SERVICE AND OUTREACH

- Outreach & DEI activities
 - Member of *Women in Physics* at New York University, a group that supports, educates, and promotes female identifying members in the Physics department.
 - Member of *Equity in Physics* at New York University, a group that promotes equality, diversity and inclusion within the department.
 - Volunteer for *Summer Youth Intensive Program* at University of California, Berkeley. (Graduate student mentor for 2016 and translator for 2017)
 - Volunteer in UC Berkeley *Early Academic Outreach Program* (K-12 Outreach Programs): teaching clean energy related topics to elementary students with hands-on science demonstrations (2015).
 - *Aid Education Program* in Zhejiang University: volunteered English teacher for underprivileged elementary students (2011, 2012)
- Active reviewer for scientific journals: Nano Letters, Soft Matter, Journal of American Chemical Society, Journal of Physical Chemistry, Nanoscale, Soft Matter, and Nano Research.
- Member of: American Chemistry Society (ACS), Material Research Society (MRS), American Institute of Chemical Engineers (AIChE), and American Physical Society (APS)