



## Prof. Dr. Yu Wang



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## Personal statement

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I was trained extensively in physical science with focus in chemistry and strong foundations in physics and computer science. **I perform both synthetic/experimental and theoretical studies** and emphasize on the development of interdisciplinary research methodology.

My research activities revolve around controllable chemistry self-assembly. Keywords include: supramolecular / polymer chemistry, semiconductor physics, in-situ TEM, DFT/MD/KMC calculations, chirality, nanochemistry, artificial intelligence, etc. **These keywords often appear in a same research, reflecting interdisciplinary creativities.** I have published 21 articles, 12 as (co-)first or corresponding author, including Science Advances, 3 Nature Communications, Chem. Soc. Rev., JACS, Chem. Sci., etc.

I joined School of Molecular Science and Engineering at South China University of Technology in Aug. 2021, and found the **Assembled Hierarchical Materials and In-situ Characterization (AHMIC) Lab**. Our research interests revolve around three intertwined directions:

1. Chemically Assembled Hierarchical Materials: we design mesoscale hybrid / hierarchical materials with specific motifs and electronic structures.
2. In-situ Characterization: we develop liquid-cell TEM and in situ X-ray techniques to reveal the governing rule for hierarchical chemical assembly.
3. Artificial Intelligence: we employ AI techniques to help the design of hierarchical materials, predict their structures and properties, and develop intelligent structural recognition methods.

## Work Experience

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| 2021.08-        | South China University of Technology, Professor  |
| 2017.08-2021.05 | UC Berkeley, MSE, Postdoc<br>Lawrence Berkeley National Laboratory, MSD, Postdoc<br>Supervisor: Prof. Haimei Zheng |
| 2016.05-2017.08 | Akron University, Department of Polymer Science, Postdoc<br>Supervisor: Prof. Stephen Z. D. Cheng                  |

## Education

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| 2009.09-2016.05 | Xiamen University, Department of Chemistry<br>Advisors: Prof. Zhong-qun Tian; Prof. Xiaoyu Cao |
| 2005.09-2009.05 | Nanjing University, Kuang Yaming Honors School<br>Advisors: Prof. Hong Yan                     |

## Teaching

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1. Structural characterization of materials
2. Scientific writing and illustration

## Publications

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*A graphic-enriched online version can be found on my website: [Link](#).*

- [1] **Y. Wang**,<sup>†</sup> X. Peng,<sup>†</sup> A. Abelson, P. Xiao, C. Qian, L. Yu, C. Ophus, P. Ercius, L-W. Wang, M. Law, and H. Zheng\*. Dynamic deformability of individual PbSe nanocrystals during superlattice phase transitions.  
*Sci. Adv.*, **2019**, 5, eaaw5623 (†Equal contribution)  
*Highlighted by Molecular Foundry, Lawrence Berkeley National Lab.*
- [2] H. L. Zhang,<sup>†</sup> **Y. Wang**,<sup>†</sup> H. Zhang,<sup>†</sup> X. Liu,<sup>†</sup> A. Lee, Q. Huang, F. Wang J. Chao, H. Liu, J. Li, J. Shi, X. Zuo, L. Wang, L. Wang, X. Y. Cao, C. Bustamante, Z. Q. Tian\*, and C. H. Fan\*. Programming chain-growth co-polymerization of DNA hairpin tiles for in-vitro hierarchical supramolecular organization.  
*Nat. Commun.*, **2019**, 10, 1006 (†Equal contribution)
- [3] **Y. Wang**,<sup>†</sup> Y. Sun,<sup>†</sup> P. Shi, X. Lin, P. Zhang, H. Fang, P. Peng, Z. Q. Tian, and X. Cao\*. Chaperone-like chiral cages for catalyzing enantioselective supramolecular polymerization.  
*Chem. Sci.*, **2019**, 10, 8076 (†Equal contribution)  
*Selected as Front Cover, Editor's Pick of the Week, and 2019 Chemical Science HOT Article Collection. Highlighted by RSC news as "Coaching catalysis".*
- [4] **Y. Wang**, X. Peng, A. Abelson, B. Zhang, P. Ercius, L-W. Wang, M. Law, and H. Zheng\*. Atomic-resolution in situ observation of the necking phenomenon during oriented attachment of PbSe nanocrystals  
*Nano Res.*, **2019**, 12, 2549
- [5] **Y. Wang**,<sup>†</sup> H. X. Fang,<sup>†</sup> I. Tranca, H. Qu, X. C. Wang, A. J. Markvoort\*, Z. Q. Tian, and X. Y. Cao\*. Elucidation of the origin of chiral amplification in discrete molecular polyhedra.  
*Nat. Commun.*, **2018**, 9, 488 (†Equal contribution)
- [6] Z. A. Nan, **Y. Wang**\*, Z. X. Chen, S. F. Yuan, Z. Q. Tian, and Q. M. Wang\*. Catalyzed assembly of hollow silver-sulfide cluster through self-releasable anion template.  
*Commun. Chem.* **2018**, 1, 99. (\*Corresponding author)
- [7] H. Qu, **Y. Wang**\*, Z. H. Li, X. C. Wang, H. X. Fang, Z. Q. Tian, and X. Y. Cao\*. Molecular face-rotating cube with emergent chiral and fluorescence properties.  
*J. Am. Chem. Soc.*, **2017**, 139, 18142. (\*Corresponding author) (Cover paper)
- [8] **Y. Wang**, H. X. Fang, W. Zhang, Y. B. Zhuang, Z. Q. Tian, and X. Y. Cao\*. Interconversion of molecular face-rotating polyhedra through turning inside out.  
*Chem. Commun.*, **2017**, 53, 8956 (Cover paper)
- [9] **Y. Wang**\*, Y. B. Sun, X. B. Ding, J. H. Liang, X. Y. Cao, and Z. Q. Tian\*. A combined electro- and photo-chemical approach to repeatedly fabricate 2D molecular assemblies.  
*Electrochim. Acta.*, **2017**, 246, 823. (\*Corresponding author)
- [10] X. C. Wang,<sup>†</sup> **Y. Wang**,<sup>†</sup> H. Y. Yang, H. X. Fang, R. X. Chen, Y. B. Sun, N. F. Zheng, K. Tan, X. Lu, Z. Q. Tian, and X. Y. Cao\*. Assembled molecular face-rotating polyhedra to transfer chirality from two to three dimensions.  
*Nat. Commun.*, **2016**, 7, 12469. (†Equal contribution)

- [11] **Y. Wang**, H. X. Lin, L. Chen, S. Y. Ding, Z. C. Lei, D. Y. Liu, X. Y. Cao\*, H. J. Liang, Y. B. Jiang, and Z. Q. Tian\*. What molecular assembly can learn from catalytic chemistry.  
*Chem. Soc. Rev.*, **2014**, 43, 399.
- [12] **Y. Wang**, H. X. Lin, S. Y. Ding, D. Y. Liu, L. Chen, Z. C. Lei, F. R. Fan, and Z. Q. Tian\*. Some thoughts about controllable assembly (I) — From catalysis to catassembly.  
*Sci. Sin. Chim.*, **2012**, 4, 525.
- [13] J. Jiang, **Y. Wang**, L. Jin, C-H Hsu, S. Zhang, J. Mao, W. Yin, T. Li, B. Ni, Z. Su, J. Huang, C. Wesdemiotis, K. Yue, W. Zhang\*, and S. Z. D. Cheng\*. Modularly constructed polyhedral oligomeric silsesquioxane-based giant molecules for unconventional nanostructure fabrication.  
*ACS Appl. Nano Mater.*, **2020**, 10.1021/acsanm.0c00231.
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*Nat. Chem.*, **2019**, 11, 899.
- [15] R. Lu, X. Yan, L. Zhu, L. Yang, H. Qu, X. Wang, M. Luo, **Y. Wang**, R. Chen, X. Wang\*, Y. Lan\*, J. Pei, W. Weng, H. Xia, and X. Cao\*. Unveiling how intramolecular stacking modes of covalently linked dimers dictate photoswitching properties.  
*Nat. Commun.*, **2019**, 10, 5480.
- [16] Q. Zhang, G. Gao, Y. Shen, X. Peng, J. Shangguan, **Y. Wang**, H. Dong, K. Bustillo, L. Wang, L. Sun, and H. Zheng\*. Anomalous shape evolution of Ag<sub>2</sub>O<sub>2</sub> nanocrystals modulated by surface adsorbates during electron beam etching.  
*Nano Lett.*, **2019**, 19, 591.
- [17] X. X. Peng, A. Abelson, **Y. Wang**, C. Qian, J. Shangguan, Q. Zhang, L. Yu, Z. W. Yin, W. Zheng, K. C. Bustillo, X. Guo, H. G. Liao\*, S. G. Sun, M. Law, and H. M. Zheng\*. In situ TEM study of the degradation of PbSe nanocrystals in air.  
*Chem. Mater.*, **2019**, 31, 190.
- [18] X. C. Wang, P. X. Peng, W. Xuan, **Y. Wang**, Y. B. Zhuang, Z. Q. Tian, and X. C. Cao\*. Narcissistic chiral self-sorting of molecular face-rotating polyhedra.  
*Org. Biomol. Chem.*, **2018**, 16, 34.
- [19] Z. W. Lin, J. Sun, Y.B. Zhou, **Y. Wang**, H. Xu, X. Yang, H. Su, H.G. Cui, T. Aida, W. Zhang\*, and S. Z.D. Cheng\*. A noncrystallization approach toward uniform thylakoids-like 2D “nano-coins” and their grana-like 3D suprastructures.  
*J. Am. Soc. Chem.*, **2017**, 139, 5883.
- [20] L. Q. Xie, T. Y. Zhang, L. Chen, N. Guo, **Y. Wang**, G. K. Liu, J. R. Wang, J. Z. Zhou, J. W. Yan, Y. X. Zhao\*, B. W. Mao\*, and Z. Q. Tian. Organic–inorganic interactions of single crystalline organolead halide perovskites studied by Raman spectroscopy.  
*Phys. Chem. Chem. Phys.*, **2016**, 18, 18112.
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*J. Am. Soc. Chem.*, **2015**, 137, 2828.