Houyang Xu

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Education

University of Cambridge Oct. 2021 – Oct. 2025 (Completed, formal conferral scheduled Jan. 2026)
PhD in Chemistry
Supervisor: Prof. Jonathan Nitschke
Thesis: *On the Structural Adaptability and Dynamics of Metal-Organic Cages*

Sun Yat-sen University Aug. 2017 – Jul. 2021
BSc (Hons) in Chemistry
Supervisor: Prof. Kelong Zhu

South China Normal University May 2020 – Jun. 2020
Undergrad Research Intern
Supervisor: Dr. Renfeng Dong

Research Interests

Self-assembly, supramolecular chemistry, conformationally adaptable molecules, and the design of self-assembled biomacromolecules and related materials.

Publications

1. **Xu, H.**; Ronson, T. K.; Heard, A. W.; Teeuwen, P. C. P.; Schneider, L.; Pracht, P.; Thoburn, J. D.; Wales, D. J.; Nitschke, J. R.* A pseudo-cubic metal-organic cage with conformationally switchable faces for dynamically adaptive guest encapsulation. *Nat. Chem.* **2025**, *17*, 289–296.
2. **Xu, H.**; Zhu, K.* Supramolecular recognition and mechanically interlocked molecules based on imidazoliums and crown ethers. *Sci. Sin. Chim.* **2023**, *53* (12), 2509–2522.
3. Lin, M.; Bian, L.; Chen, Q.; **Xu, H.**; Liu, Z.; Zhu, K.* Cyclization of an Achiral Flipping Panel to Homochiral Tubes Exhibiting Circularly Polarized Luminescence. *Angew. Chem. Int. Ed.* **2023**, *62* (28), e202303035.
4. **Xu, H.**; Lin, M.-D.; Yuan, J.; Zhou, B.; Mu, Y.; Huo, Y.; Zhu, K.* Fluorescence emission enhancement of a T-shaped benzimidazole with a mechanically-interlocked suit. *Chem. Commun.* **2021**, *57* (26), 3239–3242.
5. Yang, Q.[†]; **Xu, H.**[†]; Wen, H.; Zhao, H.; Liu, X.; Cai, Y.*; Wang, H.*; Dong, R.* Graphene oxide induced enhancement of light-driven micromotor with biocompatible fuels. *Appl. Mater. Today* **2021**, *22*, 100943.

Research Projects

My PhD research projects focus on the dynamics and adaptability of metal-organic cages.

- **Dynamic adaptive guest encapsulation in a conformationally switchable pseudo-cubic cage**
  Project leader, published in *Nature Chemistry* as the first author.
- **Adaptive self-assembly of heteroleptic triangular prisms with a geometrically flexible quadrilateral subcomponent**

Project leader, manuscript in preparation.

- **Steric hindrance and secondary interactions govern transformation between two complex Cu^{I} coordination cages**
  Project leader, under review in the *Journal of the American Chemical Society*.
- **Structural switching between obtuse and acute coordination rhombohedra featuring rhombic ligands**
  Project co-leader and initiator, manuscript in preparation.
- **Dynamic Ag^{I}_{2}-vertices forms of a 1D-coordination polymer from a pseudo-cubic cage**
  Project co-leader and initiator, manuscript in preparation.
- **Peptide cages : Bioinspired supramolecular architectures for next-generation applications**
  Invited by and under review in *Chemical Science*

Teaching and Service

L6 Supramolecular Chemistry University of Cambridge, Apr. 2022 – May 2025
Course supervisor, leading small-group tutorials to guide Part III (integrated master's) students through course material and past exam problems.

Part II Chemistry University of Cambridge, Oct. 2022 – May 2023
Lab demonstrator, leading practical sessions for Part II (third-year) undergraduate students.

Materials RIG Student Committee Member University of Cambridge, Oct. 2022 – May 2023
Organised seminars and student engagement activities within the Materials Research Interest Group.

Part IA Chemistry University of Cambridge, Oct. 2021 – May 2022
Lab demonstrator, supervising practical sessions for Part IA (first-year) undergraduate students.

Conference Presentations

- **Poster Presentation**: "Engineering structural adaptability into subcomponent self-assembled structures"
  RSC Macrocyclic and Supramolecular Chemistry (MASC) Meeting, York, UK, Dec. 2024
- **Poster Presentation (Best poster awardee)**: "Bistable faces of a pseudo-cubic host switch from *endo* to *exo* upon binding large guests"
  International Symposium on Macrocyclic and Supramolecular Chemistry (ISMSC) Hangzhou, China, May 2024
- **Poster Presentation**: "A Rational Designed Concave-Convex Switchable Pseudo-cubic Cage as a Structurally Adaptable Supramolecular Host"
  796. WE-Heraeus-Seminar, Bad Honnef, Germany, Sep. 2023
- **Attendee**: "RSC Macrocyclic and Supramolecular Chemistry Meeting"
  University of Liverpool (Virtual), Dec. 2021

Awards and Honours

- Greta Burkill Fund Award Peterhouse, University of Cambridge, Dec. 2024
- Best Poster Award The International Symposium on Macrocyclic and Supramolecular Chemistry (ISMSC), May 2024
- Bruckmann Fund Award Peterhouse, University of Cambridge, May 2024

- Outstanding Graduate Award — Sun Yat-sen University, Jun. 2021
- Excellent Undergraduate Thesis Prize — Sun Yat-sen University, May 2021
- The Chongqing Xu Scholarship — Sun Yat-sen University, Oct. 2020
- Excellent Undergraduate Scholarship, Second Prize — Sun Yat-sen University, Oct. 2020
- Excellent Undergraduate Scholarship, Second Prize — Sun Yat-sen University, Oct. 2019
- Outstanding Student Leader Prize — Sun Yat-sen University, Sept. 2019
- Shengyi Scholarship, Second Prize — Songshan Lake National High-Tech Zone, Sept. 2019
- Innovative Chemical Experiments and Research program, Second Prize — Sun Yat-sen University, Oct. 2019
- Excellent Undergraduate Scholarship, Second Prize — Sun Yat-sen University, Oct. 2018

Relevant Skills

Languages: English, Mandarin, Cantonese
Programming: Python, LaTeX
Software: Olex2, PyMOL, SHELX, SCIGRESS, Mercury
Analytical Techniques: Single-crystal X-ray diffraction structural refinement, molecular modeling, NMR spectroscopy, mass spectrometry