Università degli Studi di Padova

DiSC

Giovedì **3 ottobre 2024** alle ore **16:30** presso l'aula F

il Prof. Weiwei Zhang
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terrà il seminario dal titolo:

Crystalline organic photocatalysts for solar fuel production

Photocatalysis is a green process that coverts solar energy into clean fuels and chemicals using water and air as raw materials. However, its effectiveness is currently limited by challenges such as short charge transport distances, high charge recombination rates, and difficulties in charge separation, which hinder its photo-chemical conversion efficiency. To address these issues, we have carefully engineered crystalline organic photocatalysts by: i) developing a reconstruction strategy to synthesize stable, crystalline covalent organic frameworks (COFs) photocatalysts; ii) introducing a confined synthesis protocol to reduce the particle size of COF photocatalysts to nanoscale; iii) and developing molecular nanojunction photocatalysts by integrating high-throughput batch screening and scaled-up flow synthesis. These have led to significantly improved charge transfer within the photocatalysts, achieving some of the highest photocatalytic performance for organic materials.

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[2] **W. Zhang#**, M. Yu#, T. Liu, M. Cong, X. Liu, H. Yang, Y. Bai, Q. Zhu, S. Zhang, H. Gu, X. Wu, Z. Zhang, Y. Wu, H. Tian, X. Li, W.-H. Zhu* and A. I. Cooper*, *Nat. Synth.*, **2024**, *3*, 595.

[3] W. Zhao, L. Luo, M. Cong, X. Liu, Z. Zhang, M. Bahri, B. Li, J. Yang, M. Yu, L. Liu, Y. Xia, N. Browning, W.-H. Zhu, **W. Zhang***, A. I. Cooper*. *Nat. Commun.*, **2024**, *15*, 6482.

[4] T. Xu, Z. Wang, **W. Zhang***, S. An, L. Wei, S. Guo, Y. Huang, S. Jiang, M. Zhu, Y. Zhang and W.-H. Zhu*, *J. Am. Chem. Soc.*, **2024**, *146*, 20107.

[5] M. Yu, **W. Zhang***, X. Liu, G. Zhao, J. Du, Y. Wu and W.-H. Zhu*, *Green Energy Environ.*, **2024**, 10.1016/j.gee.2024.04.001.

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Stefano Mammi