**Renhao Dong**
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**Short Biography (max. 300 words)**

Dr. Renhao Dong received his Bachelor's degree in chemistry and then doctor's degree in physical chemistry in Shandong University. He joined Max Planck Institute for Polymer Research (Germany) as a Postdoctor in 2013. Since 01/2017, he has worked as a group leader and then a TUD Young Investigator, leading a research group at Dresden University of Technology (TUD), Germany. Since 07/2021, he has established a group as a full Professor in Shandong University. He is also a fellow of Young Academy of Europe (YAE). Thus far, Dr. Dong has published over 110 peer-reviewed articles in Nature Materials, Nature Chemistry, Nature Synthesis, and so on, which have attracted more than 12000 citations with h-index of 50. His current scientific interests focus on organic 2D crystalline materials and functions, including: (1) Development of interface-assisted synthesis methodology; (2) 2D conjugated polymers: chemistry and functions for electronics and energy; (3) Metal-organic framework electronics (MOFtronics): conductive 2D conjugated MOFs for opto-electronics, spintronics, energy and sensing; 4) van der Waals heterostructures based on organic 2D crystals and novel physical properties.

**Title of the keynote talk: Conductive 2D framework materials for electronics: FMtronics**

**Abstract of the keynote talk (max 500 words)**


In our work, we have employed interfacial chemistry toward the controlled synthesis of conductive 2D framework materials (2DFMs) with precision structures.[1] For instance, we demonstrated the synthesis of 2D conjugated metal-organic framework (2D *c*-MOF) at the air-water or liquid-liquid interfaces. The 2D *c*-MOFs feature with stacked layers and possess unique electronic properties, such as full $\pi$ delocalization, narrowed band gaps and high conductivity, which render 2D *c*-MOFs as advanced electronic materials.[2] One representative iron-

bis(dithiolene) 2D MOF exhibited as a *p*-type semiconductor with a band-like transport and high mobility.[3] Owing to their conductivity, the 2D *c*-MOFs have shown potential for transistors, photodetectors, sensing, magnetics, and energy storage and conversion.[4] In addition, we have also synthesized highly crystalline 2D polymers on the water surface. For instance, we have employed a surfactant-monolayer-assisted interfacial synthesis (SMAIS) method to prepare 2D polymers,[5] like 2D polyimides, 2D polyimines and boronate ester 2D polymers, which exhibit few-layers and micrometer-sized single-crystalline domains, which have been utilized as active layers for optoelectronics and memory devices. As another typical example for SMAIS, we have developed charged 2D polymer single crystals through an irreversible Katritzky reaction under pH control, which could act as an anion-selective membrane for osmotic energy generation, offering a high chloride ion selectivity.[6] In our latest work, we have developed BBL-based 2D conjugated polymer film, which exhibited high THz mobility over $10^3$ $cm^2/Vs$.[7] We expect that our research could push the development of conductive 2DFMs for electronics (FMtronics).

References

[1] *Chem. Rev.* **2018**, 118, 6189.
[2] *Chem. Soc. Rev.* **2021**, 50, 2764.
[3] *Nat. Mater.* **2018**, *17*, 1027.
[4] *Nat. Mater.* **2021**, *20*, 122.
[5] *Nat. Chem.* **2019**, *11*, 994.
[6] *Nat. Synth.* **2022**, *1*, 69.
[7] *Nat. Mater.* **2023**, *22*, 880.