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On-Surface Synthesis of 2D Magnetic MOFs on Surfaces

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We will present a new synthetic approach that enables us to handle two long-standing synthetic challenges in the growth of magnetic 2D MOFs: i) formation of high-quality large-scale 2D MOFs with atomic precision on hundreds of nanometers; ii) design of 2D MOFs with long-range order magnetic coupling with a complex spin texture resulting from the interplay between ferromagnetic and antiferromagnetic π-d interactions. The new synthetic approach consists of forming a high-quality template by supramolecular assembly of organic ligands [1], followed by metal coordination via the deposition of single atoms [2], thereby preserving the template's quality and lattice.

References:

[1] F. Frezza et al,, *JACS* **146**, 3531 (2024)

[2] F. Frezza et al, *JACS* **147**, 319575 (2025)