KN-14

Molecular Organisation: Working with Molecules on the Nanoscale

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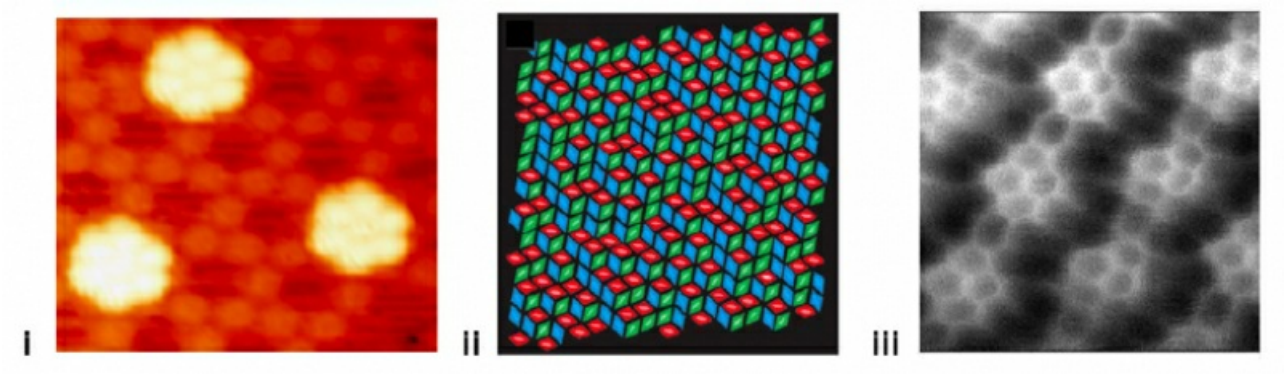
Non-covalent directional intermolecular interactions provide a pre-determined recognition pathway which has been widely exploited in supramolecular chemistry to form functional nanostructures in both solution and in the solid-state. Our studies using hydrogen-bonding interactions to enable the directed assembly of extended nanostructures will be presented and in particular the lecture will focus on our work investigating surface-based self-assembly processes.
The talk will include studies that demonstrate unprecedented control of supramolecular topology (Fig. i) [1] the first direct observation of a molecular-scale glass (Fig. ii) [2] and the generation of a new class of porphyrin molecular tiles that are functionalised with DNA bases. Recent developments in scanning probe microscopy allow direct visualisation of sub-molecular features (Fig. iii).[3] Most importantly our work establishes a direct connection between crystal engineering, supramolecular chemistry and nanostructure fabrication.
1. Theobald, J.A. et al. (2003) Nature, 424, 1029-1031; 2. Blunt, M.O. et al. (2008) Science, 322, 1077-1081; 3. Sweetman, A.M. et al. (2014) Nature Commun., 5, 3931.



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