MOLECULAR ORGANISATION: A JOURNEY THROUGH COMPLEX STRUCTURES

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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 the solid-state, in solution and on surfaces. Our studies using intermolecular interactions to enable the directed assembly of extended nanostructures will be presented.

The talk will include studies of solid-state self-assembly to create metal-organic frameworks (MOFs), including examples that enable the crystallographic study of reaction processes (Fig. i) [1,2]; solution-phase self-assembly of interlocked structures, including new molecular handcuff structures (Fig. ii) that facilitate studies of the effect of intermolecular stacking on optical and redox properties [3]; and surface-based self-assembly studies including highly unusual random self-assembly (Fig. iii) [4,5].

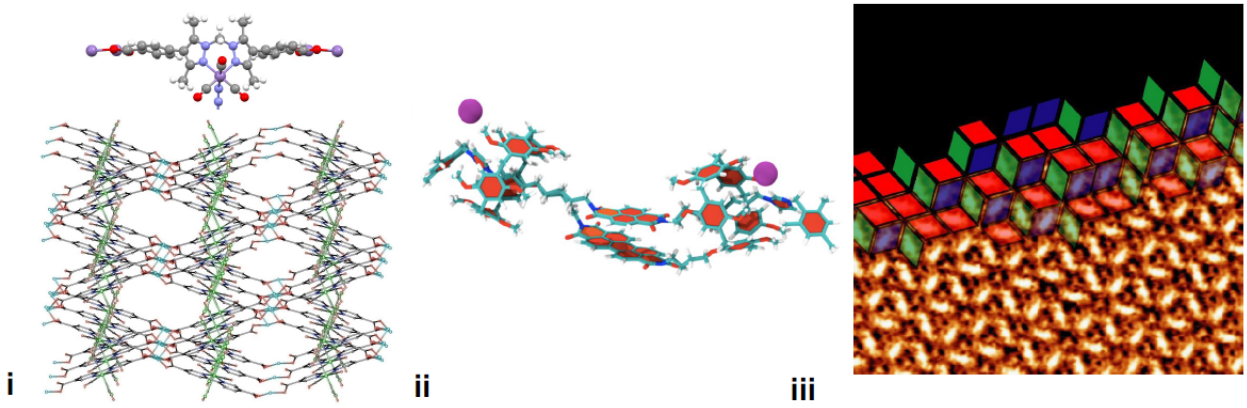

Figure: **i** A MOF that supports metal [Re(diimine)$(CO)_3$X] complexes which undergo photo-induced transformations [1] and a metal-azide complex tethered to a MOF which undergoes single crystal-single crystal reactions at the metal centre [2]; **ii** rylene diimide molecular handcuffs created using pillar[5]arene imidazolium rotaxanes.[5] **iii** STM image of a surface supramolecular framework based on rhombus tiles; bright features represent individual molecules which can then be represented as rhombuses [5].

References

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