

**W0105**

**Design and Synthesis of Co-crystals using Molecular Sense and Supramolecular Sensibility.** Christer B. Aakeröy, Dept. of Chemistry, Kansas State Univ., Manhattan, KS, 66506, USA, aakeroy@ksu.edu.

What is most likely going to happen when a homogeneous solution containing two different molecular solutes is allowed to evaporate to dryness? Unless a chemical reaction driven by the formation of covalent bonds takes place between the two solutes one would, as a rule, expect the appearance of two separate molecular solids. This is a manifestation of the inherent structural selfishness of molecules, something that is relied upon every time recrystallization is employed as a method of purification. Recrystallization processes are essential in most covalent synthetic procedures and are performed on a regular basis in every synthetic laboratory. In the supramolecular laboratory, however, the very same process also provides an opportunity to move in the opposite direction – a co-crystallization is a deliberate attempt at bringing together different molecular species in one crystalline lattice without making or breaking covalent bonds. Since the odds are stacked firmly in favor of a homomeric product, how do we go about developing reliable and versatile synthetic methods for the directed assembly of co-crystals? This presentation will attempt to answer the question by outlining several modular hydrogen-bond driven strategies for the design and synthesis of binary and ternary supermolecules and co-crystals.