

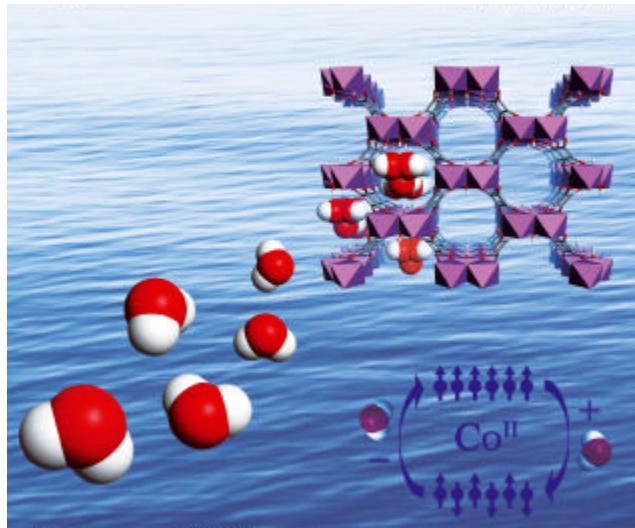
# Coordination Framework Materials

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Over recent years the design and synthesis of molecular materials has seen the emergence of a range of interesting host-guest, electronic, magnetic and mechanical phenomena. The considerable versatility of molecular chemistry offers many opportunities in these areas, notably through the ability to incorporate specific function into molecular lattices and, in many cases, to achieve unprecedented materials properties.<sup>[1]</sup> The seminar will address four areas:

- *Nanoporosity.* The linkage of molecules with strong binding interactions has generated robust open lattices that are able to act as hosts for molecular guests.<sup>[2]</sup>
- *Electronic Switching.* The incorporation of spin-crossover centres into nanoporous molecular frameworks has led to the first porous materials that may be switched between multiple electronic states.<sup>[3]</sup>
- *Magnetic Ordering.* The incorporation of ligand-mediated magnetic exchange between metal sites has led to a number of interesting nanoporous magnetic phases (see figure).<sup>[4]</sup>
- *Negative Thermal Expansion* (NTE, ie, contraction with heating). These materials are structurally distinct from all existing NTE systems, opening an important new window into this exotic phenomenon.<sup>[5]</sup>



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