

Interaction and Phase Transitions in a Potototype Self-assembled Supramolecular Aperiodic Crystal

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This contribution reports on very new structural and physical properties in self assembled supramolecular materials, considering host-guest intergrowth crystals. A host urea molecule forms hydrogen-bonded hexagonal channels of 5.5 Å diameter in which long guest chains are densely packed in a one-dimensional arrangement [1]. This simple paradigm crystal offers a unique opportunity to address at a fundamental level the question of the nature and the roles of interactions in self-organized architectures [2]. Original physical properties in these host-guest materials are related to their aperiodic feature which, unambiguously, appears in their superspace diffraction pattern [3,4]. Here, we will present a first evidence of a superspace symmetry breaking involving only the internal variable of the superspace in these materials. These observations force a total reconsideration of the interactions in these self-organized compounds.

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