Nanoscale Structures – Building "Brick" by "Brick"

One of the major technological challenges in nanoscience and nanotechnology is the self-assembly of tiny nano-building units (parts and kits) into larger organized conformations and geometrical architectures for device applications. Over the past several years, the challenge of large-scale assembling large-scale structures from meso-, micro-, and nano-structured building components has attracted significant interests in materials synthesis and fabrication. A number of self-assembly processes have been proposed in recent years based on different driving mechanisms, such as surface tension, electric and magnetic forces, etc. Generation of curved architectures has been a major challenge, and researchers have suggested methods for assembling them from *prefabricated* building blocks. Now, Associate Professor Zeng Hua Chun's research group in the Department of Chemical & Biomolecular Engineering has devised a new organization scheme for self-generation of curved architectures from building blocks formed *in situ*. First, nanoribbons of CuO form rhombic crystal strips spontaneously and these CuO units then self-assembled into dandelion-like architectures with hollow interiors. In contrast to previous methods, this novel hierarchical organizing scheme relies primarily on geometric constrains of building blocks through a total chemical process. This work, published in the prestigious *Journal of the American Chemical Society* (Vol. 126, pp 8124-8125, 2004) is also featured in the section *"Heart Cut"* of *The American Chemical Society*'s website (August 2, 2004).