

## Microsymposium

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### *Hydrogen Bonds and Self-Assembly to Direct Reactivity in the Solid State*

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In this presentation, we will describe our efforts to develop a general method to control chemical reactivity in the organic solid state. We use the method to provide access to complex organic molecules such as ladderanes and cyclophanes. In our method, we exploit hydrogen-bond-directed self-assembly with the use of small-molecule templates to assemble and preorganize olefins for intermolecular [2+2] photodimerizations. The templates assemble the olefins within discrete supramolecular assemblies for single and multiple photoreactions. By assembling the olefins within discrete assemblies, we overcome problems of long-range packing that have frustrated previous attempts to control the dimerization. We will also demonstrate how the approach provides a unique form of supramolecular catalysis that exploits fundamentals of mechanochemistry.

**Keywords:** hydrogen bonds, supramolecular chemistry, [2+2] photodimerization