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REFRESHMENTS WILL BE SERVED PRIOR TO THE LECTURE

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The Chemistry of Metal -Organic Frameworks

Since the first report of metal-organic frameworks in the mid-1990s, the chemistry of these frameworks has rapidly developed to become one of the fastest growing field of science. In this lecture the challenges and solutions to making crystalline, truly porous frameworks, and the ‘grammar’ of linking organic and inorganic building blocks by strong bonds into MOFs will be described. The flexibility with which these structures can be varied and modified has led to a plethora of structures and applications especially in catalysis, carbon capture, and water harvesting from desert air. The lecture will conclude by showing how multivariate structures of MOFs may very well lead to sequence-dependent materials properties.

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Extending Organic Chemistry to Infinite 2D and 3D

Over one hundred years ago Gilbert N. Lewis published his conceptual paper concerning the chemical bond. Since that report, the covalent bond occupied a central role in building up organic molecules leading to polymers and pharmaceuticals. Since our discovery of covalent organic frameworks in 2005, the chemistry of the covalent bond was extended to crystalline two- and three-dimensional structures. This opened the way to carrying out chemistry on frameworks (i.e. the development of precision chemistry beyond the molecule). The union of the covalent and the mechanical bond gives way to incorporating flexibility and dynamics into frameworks and leads to molecular weavings. This provides a whole new way of thinking about materials beyond the molecules e