

Metal-organic frameworks (MOFs) and covalent organic frameworks (COFs) are two related classes of synthetic materials, characterized by regular structures and high porosity. These features make them attractive for various applications, e.g. in catalysis, hydrogen storage, drug delivery, and others. Because of the presence of large voids in MOFs and COFs, these structures are inherently flexible. In this project we want to control this flexibility by building framework materials from specially designed elements, which will act as rotors, hinges, and springs. These elements will contain electric dipoles, which will be able to move in external electric field. As a result these materials will be able to perform various functions, e.g. as information storage media, or actuators (“artificial muscles”).