

NYU DEPARTMENT OF CHEMISTRY



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Areas of Research/Interest

Chemical crystallography, interactions of light and organized media, polycrystalline pattern formation, origin of life science, experimental history of science.

Research Description

Crystalline polyhedra are prototypical material objects; light is ethereal. Yet, there has been a surprising reciprocity between crystals and light. Polarization and photon entanglement are crystal-optical discoveries while light scattering has been unsurpassed in the characterization of crystals. We engage this dialogue through investigations of unusual crystalline materials that have informed crystal growth mechanisms and led to the design of new optical materials. Recently, we have focused on the interactions of light with organized polycrystals that occur in biopathological structures, high-polymers, molecular crystals, and simple salts; pattern formation is one of the great organizing principles common to all of the sciences. We develop polarization imaging methodologies for the study of complex aggregates and are especially interested in defining heterogeneities and anisotropies of chiroptical properties.

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