WEEKLY SEMINAR

Topic: **Pathological Crystals: From Spirals to Therapies**

Speaker: **Michael Ward, New York University**

Time: 15:30-16:30, 15 April, 2014

Venue: Room 333, Geography Building, 3663 Zhongshan Road North, Shanghai
(华东师范大学中山北路校区，地理楼 333 室)

ABSTRACT OF THE TALK

The crystal growth of conventional materials like silicon has been refined for decades and has led to textbook crystal growth models. Confidence in these models quickly evaporates when considering complex inorganic solids and molecular crystals, however, despite the importance of these materials to technology, biology, and human health. In particular, many crystalline materials are associated with diseases, from malaria to kidney stones. This presentation will illustrate the beauty and complexity of crystal growth, through mechanisms often hidden and deceptive, in pathological molecular crystals, including kidney stones. These mechanisms are revealed by a combination of real-time atomic force microscopy and simulations. Armed with an understanding of crystal physics, crystal surface structure at the molecular level, and computation modeling of crystal surfaces, we can design crystal growth inhibitors that bind to specific crystal sites and prevent the formation of certain kidney stones, suggesting a pathway to therapies for crystal-based diseases in general.

BIOGRAPHY

Michael D. Ward received his B.S. degree in Chemistry from the William Paterson College of New Jersey in 1977 and his Ph.D. degree at Princeton University in 1981. He was a Welch postdoctoral fellow at the University of Texas at Austin, between 1981 and 1982. He joined the research staff at Standard Oil of Ohio in Cleveland in 1982, and in 1984 he became a member of the research staff at the Dupont Central Research and Development Laboratories in Wilmington, Delaware. Ward joined the faculty of the Department of Chemical Engineering and Materials Science at the University of Minnesota in 1990, where he was a Distinguished McKnight University Professor and Director of the University of Minnesota Materials Research Science and Engineering Center (MRSEC). He moved to New York University in 2006 to create the Molecular Design Institute, and in 2008 Ward and his NYU colleagues inaugurated the NSF-supported NYU Materials Research Science and Engineering Center, of which he is the Director. He was appointed as a Silver Professor by NYU in 2008 and Chair of the Department of Chemistry in 2009. Ward also is an Editor for the ACS journal Chemistry of Materials, and a Fellow of the Materials Research Society, the American Chemical Society, and the American Association for the Advancement of Science.