## Crystals and nanoclusters: a geometry puzzle? Marjorie Senechal (Smith College)

## Abstract

As B. N. Delone once said, "Tradition ascribes to Plato the discovery of the five regular convex solids . . . and Fedorov discovered the five parallelohedra." Indeed, for a century after Fedorov's 1885 discovery, the parallelohedra were the more momentous for crystallography, because they characterize periodic crystal structures. A century after Fedorov, the discovery of quasicrystals overthrew the periodicity paradigm. Now crystallographers are turning to Plato again, modeling condensed matter not by tilings but by dense packings and coverings of tetrahedral and icosahedral nanoclusters. I will outline the geometry questions this new viewpoint poses.