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Marjorie Wikler Senechal* (senechal@smith.edu), Burton 211, Smith College, Northampton, MA 01063. *Icosahedra: stem cells of the solid state?* Preliminary report.

Once upon a time, not so very long ago, the regular icosahedron was exhibit A among shapes impossible for crystals. But, as the Nobel Prize Committee for Chemistry pointed out in awarding its 2011 prize, “science is a theoretical construction on an empirical fundament. Observations make or break theories.” Quasicrystals show that “icosahedral crystal” is an oxymoron no longer. But the paradigm shift these new materials have brought about goes deeper. Evidently, the icosahedron plays an important role in the growth and structure of both periodic and nonperiodic materials. In this talk I will survey theoretical and experimental work on the geometry of icosahedral clusters, and suggest that whether these clusters become glasses or quasicrystals or periodic crystals (single or twinned) depends on local material conditions, yet to be clarified. (Received December 11, 2011)