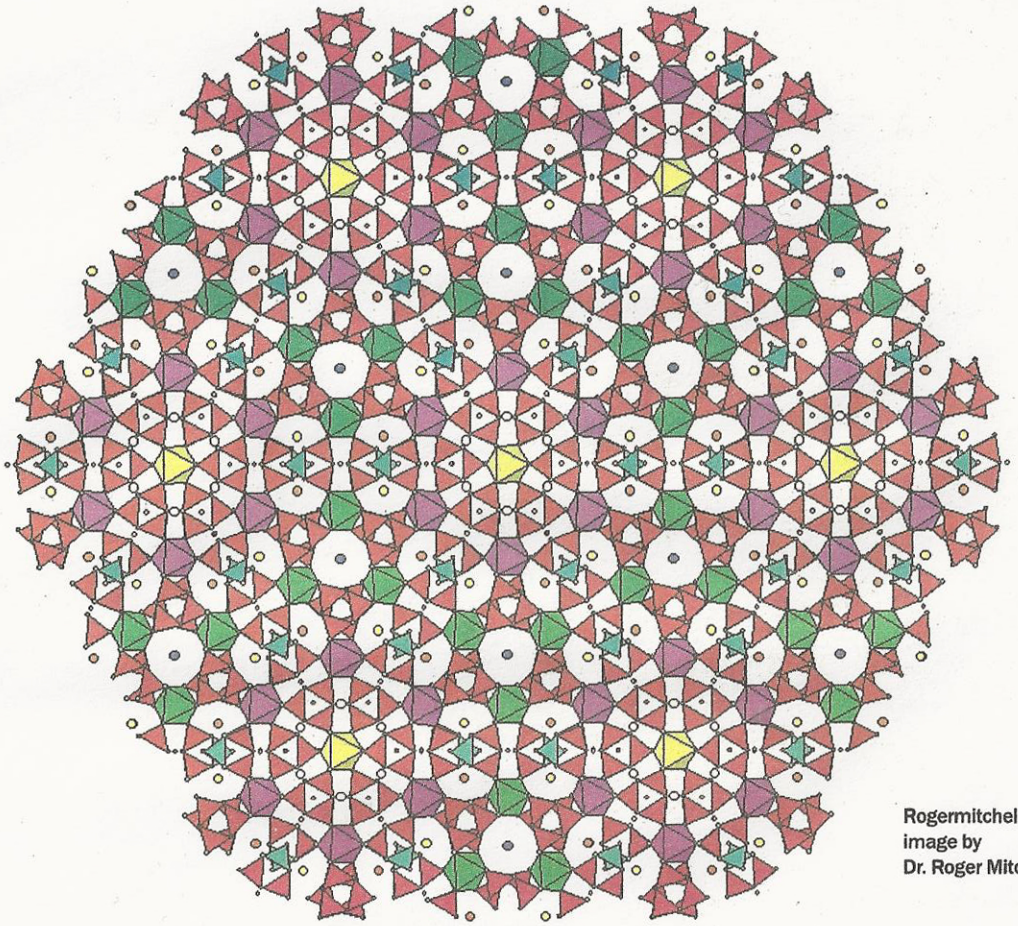
2014: The International Year of Crystallography (Huh?)

By Sarah Kerton



Rogermitchellite, image by Dr. Roger Mitchell

What better time of year to write about crystallography than the days when even the smallest among us are celebrating crystals in the ever-fascinating form of snowflakes? Crystallography is the science that examines the arrangements of atoms in solids. It is a little-known term, yet is foundational to life as we know it. For this reason, and in commemoration of the centennial anniversary of x-rays—seen as the birth of modern crystallography—the United Nations has declared 2014 the International Year of Crystallography. The UN, along with the International Union of Crystallography, will be coordinating educational and capacity-building activities all year.

While crystals have fascinated humanity for over 2000 years, modern crystallography has revealed the structure of DNA, allowed the creation of computers and green energy, and helped scientists to design new materials and drugs. Crystallography permeates our daily lives, from the snowflake and the rainbow to the pharmaceutical and mining industries.

Thunder Bay's own crystallography experts, Lakehead University's Dr. Shannon Zurevinksi and Professor Emeritus Dr. Roger Mitchell, are involved in research with the synthesis of rare earth element-bearing minerals. Zurevinski says that in simple terms crystallography "is the science of a crystal—each crystal has a geometric shape with an ordered internal structure called a crystal lattice." The pair make minerals using a high-temperature furnace, and then use an "x-ray diffractometer" to help classify and study the crystal lattice of their new minerals. According to Zurevinski, this type of research has a variety of uses, including synthetic minerals that could potentially be used to immobilize (store) various forms of radioactive waste for disposal. Their research has not gone unnoticed—in 2010, a new mineral species was accepted by the International Mineralogical Association, a rare event itself, and was called "Rogermitchellite" in recognition of Dr. Mitchell's contributions to mineralogy.