Superconductor research continues to be a vibrant and exciting arena of condensed matter science after more than a century since the phenomenon was first discovered. In the past thirty years our understanding has broadened considerably due to the discovery of several new classes of high-temperature superconductors. Many of these emerge close to magnetic phases, which is surprising because conventional theory indicates that superconductivity and magnetism are anathema to one another. The so-called unconventional superconductors appear to be intimately related to magnetism, and exhibit more exotic properties. In this talk, I will discuss some of these unusual new superconductor families and the technological promises they may hold for the future.