Extreme fundamental and unsolved questions remain in the fascinating quantum mechanical phenomenon of superconductivity. Superconductivity allows magnetic levitation, transmission of electrical power with no loss, and other intriguing phenomena. Conventional superconductivity was discovered in 1911 but was not solved until 1957. There are also dozens of families of unconventional superconductors, which fall into the family of quantum materials. Quantum materials were discovered in 1979 but, surprisingly, remain unsolved. In her lecture, Laura H. Greene will describe superconductivity, unconventional superconductivity, transformative applications, and some of the many bizarre behaviors of quantum materials.