An Interdisciplinary Science

The biggest obstacle thwarting the development of cold fusion as a clean energy for the future is THEORY, not EXPERIMENTS. It is a hesitation of the engineering and science communities to recognize that the quantum physics of metals can be applied to the reaction physics of nuclear science. The nuclear engineering and science communities know that cold neutrons can flow into selected uranium nuclei, energizing the nucleus in a manner that releases some 230 MeV of nuclear energy. But they see no way by which a positively charged deuteron can enter a nucleus at room or boiling water temperature. This is a problem since for cold fusion to occur, two deuterons must join each other to create a helium nucleus and release heat. Ironically, the theory disconnect is mainly due to the same specialization that has led to the rapid technology advance that has made present day society possible.

The technology that explains cold fusion is multiply interdisciplinary. Cold fusion seems most easily explained using the languages of chemistry and metal physics, but it also requires inputs from nuclear physics and other specialties. Chemistry builds on atom and molecular physics, while the physics of metals is part of material science and has a parallel in the astrophysics of white dwarf stars. All of these are part of quantum science and subject to its disputed interpretations and its mathematical languages.

Despite all these apparent complications, cold fusion is not more difficult to understand than many of the specialties that make modern life possible. We all understand the law of conservation of energy, and that one can convert stored chemical energy into heat by burning fossil fuels. There are additional rules similar to conservation of energy that apply to the submicroscopic world of quantum mechanics. Once these theory requirements are recognized, most of cold fusion science can be understood.