

**Julian Schwinger anticipated the name of our project:  
“VCFI -- Very Cold Fusion, Indeed!”**

Julian Schwinger (1918-1994) shared the 1965 Nobel Prize in physics with Sin-Itiro Tomonaga and Richard P Feynman "for their fundamental work in quantum electrodynamics, with deep-ploughing consequences for the physics of elementary particles."

<https://www.nobelprize.org/prizes/physics/1965/summary/>

He was one of the few well-known physicists who allowed for the possibility of cold fusion on the basis of experimental results, and he wrote eight theoretical papers about it.

[https://en.wikipedia.org/wiki/Julian\\_Schwinger#Career](https://en.wikipedia.org/wiki/Julian_Schwinger#Career)

In March 1990, one year after Fleischmann and Pons made their announcement, he stated,

"In the early days of radar, prior to, and at the start of the Second World War, although the British had begun with radio waves that were called high frequency, HF, the need for better resolution led them to VHF, very high frequency, which inexorably brought about VHF, very high frequency indeed. I mention this ancient history because, **in our study of cold fusion, CF, it is useful, and implies no serious loss of relevance, to consider VCFI, very cold fusion indeed.** That is, we examine the lattice state at absolute zero. Then there are no phonon excitations — it is the phonon vacuum state — at least initially." [Emphasis added]

Schwinger, J. "Nuclear Energy in an Atomic Lattice," in The First Annual Conference on Cold Fusion. 1990.

University of Utah Research Park, Salt Lake City, Utah: National Cold Fusion Institute

<https://www.lenr-canr.org/acrobat/SchwingerJnuclearene.pdf>

In December 1991, at a conference honoring the 100<sup>th</sup> anniversary of Yoshio Nishina (1890-1951), Schwinger went beyond a theoretical examination of the lattice at absolute zero to propose a hypothesis which, to our knowledge, has not yet been tested: that cooling the lattice to very low temperatures might stabilize the nuclear active state.

"It would seem that a close approach to saturation loading is then required for effective fusion to take place. But, surely, the loading of deuterium into the palladium lattice does not occur with perfect spatial uniformity. There are fluctuations. It may happen that a microscopically large—if macroscopically small—region attains a state of such lattice uniformity that it can function collectively in absorbing the excess nuclear energy that is released in an act of fusion. And that energy can initiate a chain reaction as the vibrations of the excited ions them into closer proximity. So begins a burst. In the course of time, the increasing number of vacancies in the lattice will bring about a shut-down of the burst. The start-up of the next burst is an independent affair.

"This scenario raises an interesting question: **Would the efficacy of room temperature cold fusion be enhanced significantly by further lowering of the ambient temperature? Lower temperature would presumably decrease somewhat the probability of the initial fusion. But, it should increase the probability of forming and maintaining the lattice structure against the destructive onslaughts of thermal agitation. Experiment must supply the answer.**" [Emphasis added]

"Cold Fusion—Does It Have a Future?" J. Schwinger, *Evol. Trends Phys. Sci., Proc. Yoshio Nishina Centen. Symp., Tokyo 1990, 1991.* 57: p. 171. <https://www.lenr-canr.org/acrobat/SchwingerJcoldfusiona.pdf>

Having limited mathematical skills, I have shied away from theory. But knowing that Schwinger had openly advocated for serious consideration of "cold fusion" and had resigned from the American Physical Society because of its aggressive campaign against it, I decided that I should read some of his papers. I was surprised to learn that he had, at least in part, anticipated our project! He was not suggesting a role for superconductivity, but he was suggesting that "very cold fusion, indeed" ought to be tried!

When all is said and done, **"Experiment must supply the answer!"**