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Cold Fusion at 20: Hope Springs Eternal

Sharon Begley

For those of you with memories that go back to 1989, the news that cold fusion has not slinked off into the abyss might come as a bit of a surprise. After all, the claim 20 years ago that atomic nuclei could be induced to fuse at room temperatures (rather than the temperature of the Sun, as happens in fusion reactors) and to emit measurable quantities of heat was shown to be based on poor measurements, nonexistent controls and nutty theory. But off in the dim, dark corners of physics, the field—since renamed “low energy nuclear reactions”—continues apace, albeit without quite shaking the stigma attached to [the original claims](#), especially now that the world’s need for carbon-free energy sources has become even more desperate than it was 20 years ago.

[A brilliant 2004 story in The Washington Post](#) by Sharon Weinberger chronicled cold-fusion progress (which I should probably call “progress”) up until that year, and now comes news from the American Chemical Society of “compelling new scientific evidence for the existence of low-energy nuclear reactions (LENR), the process once called ‘cold fusion’ that may promise a new source of energy.” At [ACS’s annual meeting this week](#), no fewer than 30 papers are being presented in sessions on “New Energy Technology,” including [here](#), [here](#) and [here](#).

A number of the scientists in this field work for the federal government, which has quietly kept supporting cold fusion research (though not under that name). For instance, analytical chemist Pamela Mosier-Boss of the Navy's [Space and Naval Warfare Systems Center in San Diego](#) is presenting what she calls "the first scientific report of the production of highly energetic neutrons from an LENR device." Mosier-Boss is no novice in this field, having [unveiled tantalizing results before](#). The neutrons, she and her team suggest, came from nuclear reactions, perhaps from the fusing of deuterium nuclei. "People have always asked 'Where's the neutrons?'" Mosier-Boss says. "If you have fusion going on, then you have to have neutrons. We now have evidence that there are neutrons present in these LENR reactions."

Other teams make similar claims. [Tadahiko Mizuno](#) of Hokkaido University in Japan is reporting the production of excess heat and gamma ray emissions from his own LENR device, for instance, while Antonella De Ninno of New Technologies Energy and Environment claims she and her team got both excess heat and helium gas (both indications of nuclear reactions) from theirs.

As the research has continued, the more level-headed participants have acknowledged that LENR might reveal some unusual new physics, but is unlikely to be a source of energy. The online physics archive, where researchers post papers that may or not be published in a journal, has long been accumulating papers on LENR, such as [this](#), [this](#) and [this](#). The field holds annual conferences, such as [one in Washington, D.C., last August](#). Alas, we've been hearing similar claims for years and years.

<http://arxiv.org/abs/nucl-th/0505021>

Enhancement Mechanisms of Low Energy Nuclear Reactions

Authors: F. A. Gareev, I. E. Zhidkova

(Submitted on 8 May 2005)

<http://arxiv.org/abs/cond-mat/0602472>

Nuclear Abundances in Metallic Hydride Electrodes of Electrolytic Chemical Cells

Authors: A. Widom, L. Larsen

(Submitted on 20 Feb 2006)

<http://arxiv.org/abs/0901.2411>

A model for enhanced fusion reaction in a solid matrix of metal deuterides

Authors: K. P. Sinha, A. Meulenberg

(Submitted on 16 Jan 2009)