SHARON WEINBERGER   04.06.07 07:29 AM

Livermore Claims Isomer Advance (But No Bomb)

NO, IT'S MOST certainly not an isomer bomb, but researchers at Lawrence Livermore National Laboratory are claiming a research breakthrough working with an isomer of Thorium-229. No, they haven't "triggered" (or de-excited) the nuclear isomer yet, so you might want to actually read this press release closely to understand this is only an initial step toward controlled release of energy from nuclear isomers:
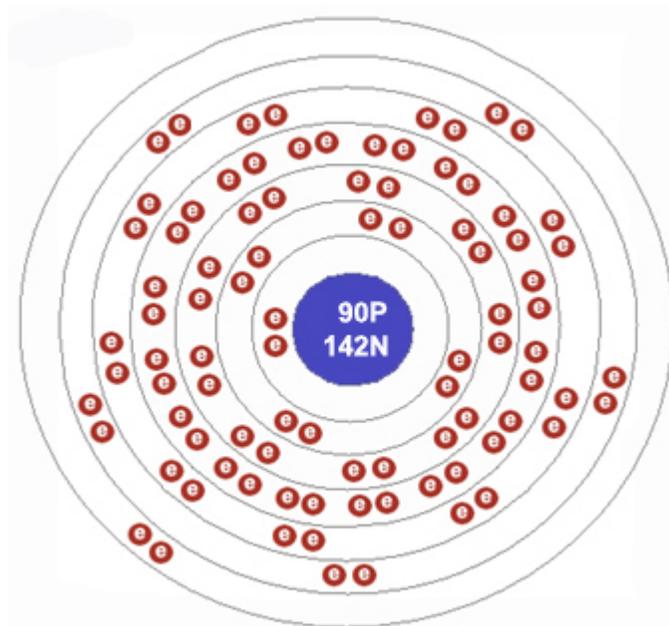
Researchers at Livermore studied an isomer of Thorium-229. This isomer is unique in that its excitation energy is near optical energies, implying that one day scientists may be able to transition

Betersdorfer, an LLNL physicist and co-author of a paper that appears in the April 6 issue of Physical Review Letters. "This only works if the laser is tuned to exactly the correct energy."

For years, researchers have been fascinated with this isomer because it could lead to new science and technology breakthroughs. Among them are: a quantum many-body study; a clock with unparallel precision for general relativity tests; a superb qubit (a quantum bit) for quantum computing; testing the effects of the chemical environment on nuclear decay rates. Isomers also may serve as a battery for storing large amounts of energy.

Back in 2003, the folks at <u>DARPA</u> got all excited by the possibility of building a <u>new generation of weapons</u> based on nuclear isomers (I also wrote <u>a book</u> about the so-called isomer bomb). The isomer bomb was based on a disputed experiment working with the isomer of hafnium-178. That idea now appears pretty much dead, though work continues in other areas of isomer research.

Notably, Livermore in this new publication isn't talking about bombs.

There's a lot of work that can (and should) be done on nuclear isomers, some of which could lead to applications, but claims that an isomer bomb are on the horizon are still very much unfounded. Work on nuclear isomers continues both in the U.S. and abroad. Along with work at the national labs, universities, like <u>Youngstown State University</u>, are also active on this front.

It'll be interesting to see what develops.

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