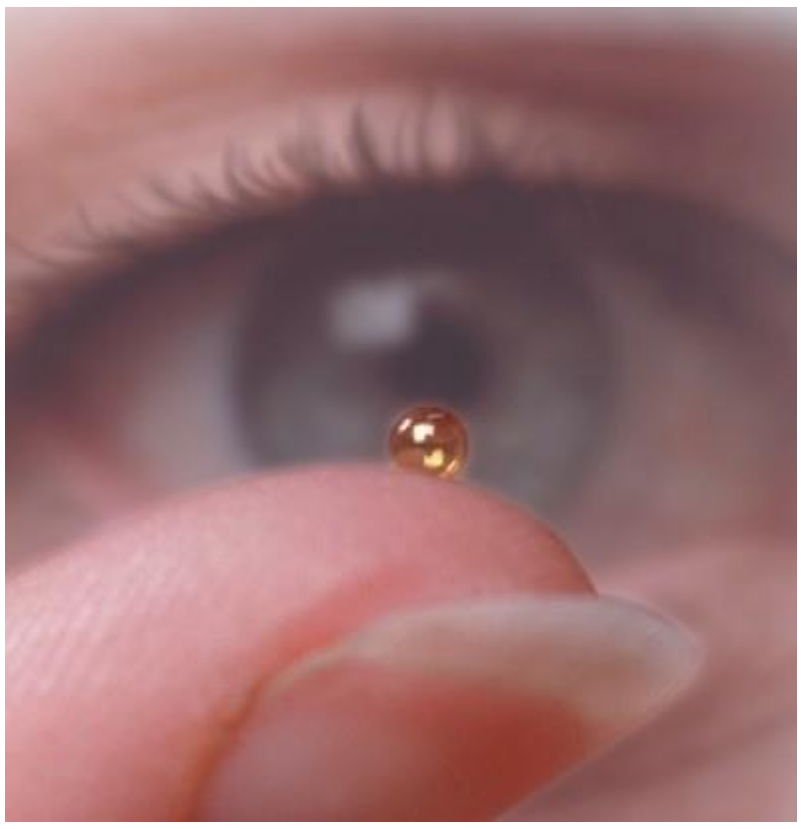
NUCLEAR FUSION
A Dead End



nuclear fusion fuel (mockup)

The $10 billion National Ignition Facility (NIF)

aiming to ignite the fuel

energy output 13 hp/hrs per day

maybe the dead end in practicality opens the door to greater alternatives with the phase change before us

New Ice Age ahead

Why can't nuclear-fusion power become practical?

The answer is located in the process itself. The basic fact is that the building of atoms requires the

investment of energy. The basic building blocks of an hydrogen atom, for example - one electron and one proton - do exist amply in space, but in an unbound low energy state, even though they carry an electric charge and interact with each other. It takes an investment of energy to bring the two building block particles into a dynamically bound interrelationship that enables the particles to create a structural form by their interaction that is 100,000 times larger than the sum of its parts, which is called, an atom. The building process typically takes place in the high-energy environment on the surface of the Sun.

As a rule, atoms are balanced structures, containing an equal number of protons (electrically positive) and electrons (electrically negative), whereby the atom becomes electrically neutral. The principle of the electric force is such that unlike polarities attract each other, and equal polarities repel each other. Since all atoms larger than hydrogen must contain multiple protons in their nucleus, to enable the building of larger atoms that give us the 100+ basic elements that exist, the crowded together protons would repel each other. For this purpose the Universe created the neutron that fits between the protons, which keeps the protons out of each other's hair and like a glue keeps the nucleus together. The neutrons carry no electric charge. They are basically internally rearranged protons that loose their electric charge, but they only exist in a stable form inside an atom.

The neutron is a key element in the nuclear-fusion energy game that is played on earth. In the atom building process it is possible that an atom gets overbuild, or the building process stops before the next higher atom is completed. The end result is called an isotope. When this happens to a hydrogen atom, an additional proton becomes a neutron and a heavy isotope of hydrogen is born, called deuterium, made with a two-part nucleus. The result is still hydrogen. It is still electrically neutral. But it is twice as heavy. The term "heavy water" that is frequently used in the nuclear-power industry is still H2O (made up of two hydrogen atoms bound to one oxygen atom) of which one of the hydrogen atoms is 'heavy' (the isotope deuterium).

The heavy isotope (deuterium) is critical for the nuclear-fusion energy game when it is brought together with a still heavier isotope of hydrogen that has two additional neutrons attached, called tritium. Tritium is so unstable that it doesn't exist naturally. It is artificially created in a nuclear power reactor by irradiating an element called lithium that thereby fissions into helium and tritium.

The nuclear fusion game, which does produce power as the hydrogen bomb illustrates, does not produce this power from the fusion process itself, but from the fissioning off, of a neutron that has no place in the new helium atom when deuterium and tritium atoms are violently smashed together to the point that the two isotopes fuse. In the process of the breakup and fusing, one of the tree neutrons that finds no place in the new nucleus rebounds with the energy that was previously invested in binding it to a nucleus. In this sense the heavy isotope can be likened to a charged up battery.

The reason why heavy isotopes are critical for producing fusion power, is that the extra mass of neutron makes it easier to overpower the natural repelling force (the Coulomb Barrier), the repelling electric force of the two protons in the nuclei. It takes enormous energies to agitate the fusion fuel so violently that their nuclei come close enough to 'touch' so that they will fuse. The neutrons that the isotopes carry, which gives them a greater momentum without adding to the repelling charge, enable the repelling Coulomb Barrier to be overcome more 'easily.' Tritium and deuterium do fuse in this process, and the splitting off neutron does deliver a significant wallop of energy.

The reason why fusion power isn't an achievable practical option is not located in that the fusion process isn't possible. It has been demonstrated that it is possible. Every hydrogen bomb explosion demonstrates that it is possible. The reason why the process is not practical for power production is rooted in a number of major problems that are inherent in the nature of the process itself.

The inherent problems are explored in detail on the following pages:

Six strikes against nuclear-fusion power

Nuclear-fusion experiments - NIF, ITER

The nuclear-fusion energy is destructive

The paradox of the nuclear-fusion fuel

The paradox of nuclear-fusion power

related pages

MSR/LFTR Liquid Fluoride Thorium Reactor

The political driver for dead-end fusion-power

Also see:

2011 - NAWAPA

2011 - Industrial Revolution

2011 - Free Electric Energy

2011 - Nuclear Fusion Power Delusion

2011 - Ice Age anew and Renaissance

2011 - Universal Love

2011 - Empire Religion

2011 - Empire Wars

2011 - Christian Science

2011 - New Science

more on empire, universe, energy, NASA, science, NAWAPA, music, world
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