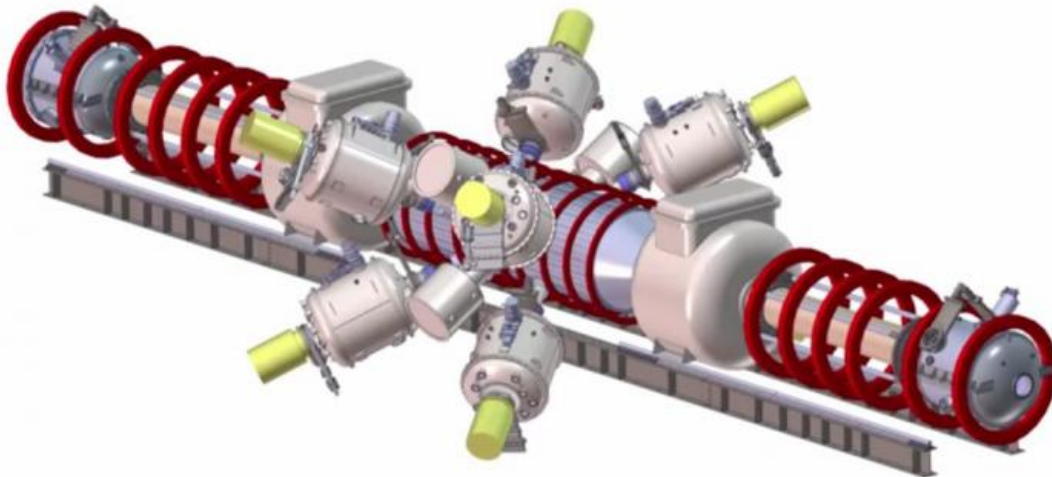


Tri Alpha Energy reportedly makes important breakthrough in developing fusion reactor

August 26 2015, by Bob Yirka



(Phys.org)—Science Magazine is [reporting](#) that physicists working at Tri Alpha Energy in Los Angeles have succeeded in building a device that held a ball of superheated hydrogen plasma for five milliseconds, longer than any other effort before, offering proof that it is possible to hold such gases in a steady state. The development represents a possible breakthrough in the development of a fusion reactor as the process involved is a move towards developing technology that can hold gases at

temperatures high enough to sustain a fusion reaction.

A true fusion reactor, if one can be built, would of course represent a transformative event in human history—it is believed such reactors could provide the energy needed to relieve our reliance on coal, and nuclear fission. The idea is relatively simple—it is the implementation that has proven to be difficult. A gas is heated to a temperature high enough so that its atoms lose their electrons creating a mass of ions and electrons, i.e. plasma. If those ions run into each other with enough force, they fuse together, causing some of their mass to be converted into energy (as happens in the sun). The trick is in heating the gas to such a high temperature that no known material could hold it—to get around that, researchers have two main possibilities, cause an implosion that occurs so quickly that the material holding it would not be impacted, or use a magnetic field—the researchers at Tri Alpha are reportedly using the second approach, but with a twist, they put magnets around a cigar shaped field-reversed configuration that allows for firing angled plasma beams at one another and hemmed in the results with magnets and electrodes. Using this approach, they were reportedly able to heat the gas up to 10 million degrees Celsius and only stopped the machine because they ran out of fuel.

While impressive, the achievement by the team in California still falls far short of the 3 billion degrees Celsius temperature needed to achieve a fusion reaction—the team next plans to tear down the machine, dubbed C-2U and replace it with an upgraded model which they believe will allow them to achieve a ten-fold increase in temperature.

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