University of Hawai`i at Mānoa

**Hawai`i Natural Energy Institute**

School of Ocean & Earth Science & Technology

# Heavy Ion Fusion – can it save the day and fry our bacon in the next decade?

The world urgently needs a new energy supply that can be brought on line quickly. Recognition of the adverse effect of $CO_2$ suggest this new supply has to be a renewable or a non-carbon-based fuel. The latter is preferable, for we need to reduce $CO_2$ in the atmosphere rather than just maintain the current rate of increase. Thus the choices seem to be direct solar capture, fission, or fusion. Of these, only fusion can supply the quantities of energy needed in the time scale required.

The fusion of Deuterium and Tritium to form He and a 14 Mev neutron is a well known reaction that yields prodigious amounts of energy. Sufficient fuel is available in sea water to sustain the global energy demand for millennia. The problem is that we have been searching for a way to harness the reaction at scales of 1 GW for six decades and common wisdom says it is still five decades away.

What is not generally known is that a safe practical way to harness the D-T reaction was researched in the 1970s but abandoned because it was only economically viable at a very large scale. The process is known as Heavy Ion Fusion and a fusion complex would produce about 100 GW of power rather than the 1 GW desired by the power industry.

The lecture will describe the means of accomplishing the controlled ignition of DT, the means of extraction of the power and the efforts of a small California corporation to harness this reaction within the decade.

**Charles Helsley**
Sea Grant College Program

**Tuesday, October 14, 2008**
**3:00 – 4:00 PM**
**POST 723**

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