

# MIT, Columbia begin new energy experiment

December 6 2004

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## *Half-ton levitating ring is key to work*

MIT and Columbia University students and researchers have begun operation of a novel experiment that confines high-temperature ionized gas, called [plasma](#), using the strong magnetic fields from a half-ton superconducting ring inside a huge vessel reminiscent of a spaceship. The experiment, the first of its kind, will test whether nature's way of confining high-temperature gas **might lead to a new source of energy for the world.**

First results from the Levitated Dipole Experiment (LDX) were presented at a meeting of the American Physical Society the week of Nov. 15. Scientists and students described more than 100 plasma discharges created within the new device, each lasting from 5 to 10 seconds. X-ray spectroscopy and visible photography recorded spectacular images of the hot, confined plasma and of the dynamics of matter confined by strong magnetic force fields.

A dedication for LDX, the United States' newest approach to nuclear fusion, was held in late October. Fusion energy is advantageous because its hydrogen fuel is practically limitless and the resulting energy would be clean and would not contribute to global warming as does the burning of fossil fuels.

Scientists using the LDX experiment will conduct basic studies of confined high-temperature matter and investigate whether the plasma may someday be used to produce fusion energy on Earth. Fusion energy

is the energy source of the sun and stars. At high temperature and pressure, light elements like hydrogen are fused together to make heavier elements, such as helium, in a process that releases large amounts of energy.

Powerful magnets, such as the ring in LDX, provide the magnetic fields needed to initiate, sustain and control the plasma in which fusion occurs. Because the shape of the magnetic force fields determines the properties of the confined plasma, several different fusion research experiments are under way throughout the world, including a second experiment at MIT, the Alcator C-Mod, and the HBT-EP experiment at Columbia University.

LDX tackles fusion with a unique approach, taking its cue from nature. The primary confining fields are created by a powerful superconducting ring about the size of a truck tire and weighing more than a half-ton that will ultimately be levitated within a large vacuum chamber. A second superconducting magnet located above the vacuum chamber provides the force necessary to support the weight of the floating coil. The resulting force field resembles the fields of the magnetized planets, such as Earth and Jupiter. Satellites have observed how these fields can confine plasma at hundreds of millions of degrees.

Source: Columbia University Office of Public Affairs

Citation: MIT, Columbia begin new energy experiment (2004, December 6) retrieved 23 April 2024 from <https://phys.org/news/2004-12-mit-columbia-energy.html>

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