Livermore's Laser Fusion Progress Widely Covered

Feb. 13—Exciting results from laser fusion experiments that were carried out last Summer and Fall at the Lawrence Livermore National Laboratory in California are attracting worldwide attention, as the results were reported in this week's issue of *Nature* magazine. The Reuters and other wire service reports, including comments by the scientists, were picked up extensively around the world.

In a series of experiments on the 192-beam National Ignition Facility (NIF), for the first time, a laser fusion experiment produced more fusion energy than the amount of energy deposited by the laser on the fuel target, described as a positive fuel-energy balance. Overall, the lasers deposit less than 1% of their total energy onto the fusion fuel, so this is not yet energy "breakeven." The Lab ran a series of experiments, changing various experimental parameters, such as the shape, energy level, and timing of the laser pulse, to try to get closer to eventually achieving a sustained fusion reaction, described as "ignition."

The importance of these results is not the amount of energy, per se, explained two top inertial fusion scientists, but that there was a self-heating of the fusion fuel. Although that heating did not lead to a sustained ignition of the rest of the fuel, they estimate that it produced about half of the total number of fusion reactions that took place. To achieve the recent result, Ed Moses, Associate Director of NIF, explained in October, that in August, the scientists had lowered the energy of the lasers "a tiny bit—about 5 percent—but more important, we changed the shape of the energy pulse.... We got three times the energy out," compared with previous experiments, Moses said.

Talking with the press yesterday, the principal author of the *Nature* article, Omar Hurricane, described the results, as "quite unique. And that's kind of a major turning point, in a lot of our minds.... We are closer than anyone has gotten before."

—Marsha Freeman