

# Inertial Confinement Fusion Using Deuterium Oxide Aerosol Generated via Ultrasonic Atomization

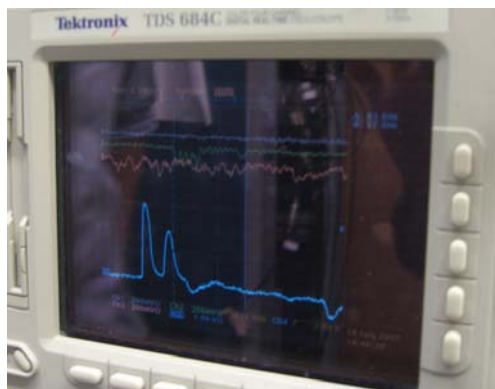
Sandi Bruce, Clarence Chan, Andrew Higginbotham,  
and Tom Donnelly

## The Theory:

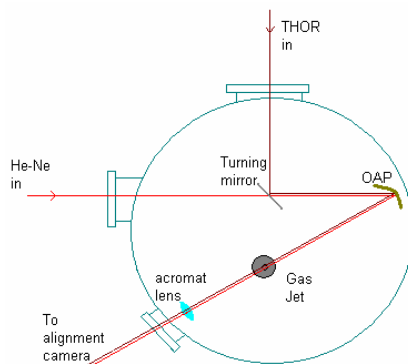
The heat produced by the UT Austin's high-powered THOR laser beam upon collision with a submicron sized deuterated water droplet is sufficient to produce fusion in the droplet. Droplets were produced by piezoelectric oscillators submerged in heavy water, and droplet size was controlled by the frequency of oscillation (6 –29 MHz). Fusion was identified by detection of neutrons emanating from the target chamber.



Droplet-creating chamber



Suspected neutron detection (green trace)



Laser/target alignment in vacuum

## Results:

While we are confident that neutrons were detected, and fusion accomplished, we were unable to produce these events reliably. Higher frequency piezoelectric oscillators showed promise in creating smaller droplets and a higher frequency of fusion events, however, these oscillators proved more prone to breakdown during heavy use.