extremely elaborate, involving in its simplest form three separate lasers and 18 independently synchronized timed events. Luckily, this is the age of microcomputers in the laboratory and such experiments are realistic even with the realitively unexperienced current generation of students in the lab.

In addition to being able to bracket the dissociation thresholds of a variety of iron and niobium clusters, we have been able to establish the following general rule of thumb: for bare metal clusters, by far the dominant fragmentation mechanism is the loss of a single metal atom -- regardless of the size of the cluster. Metal clusters do not appear to decay by a fission mechanism. This turns out to be drastically different than the behavior of semiconductor clusters such as silicon and germanium, which we have found (in the ARO - supported project) to have a strong propensity to decay by fission into large chunks in the 6 to 11 atom size range. We believe the reason for this lies in the relatively smooth evolution of bonding in metal systems, as opposed to a relatively abrupt switch in bonding in the semiconductor systems from closest-packed, icosohedral-type geometries for the small clusters to the more open, tetrahedral form preferred by the bulk silicon or germanium lattice.