Abstract Submitted
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Molecular Probing of Shocked Water.[1] ERIN NISSEN, DANA DLOTT, University of Illinois - Urbana Champaign — I have developed a method for generating powerful shock waves in liquid samples. The sample array consists of 50 miniature cuvettes each holding 125 nL, enabling a throughput of roughly 100 independent tabletop experiments per day. Planar shock waves were generated in liquid samples on impact from a laser driven flyer plate, whose velocity was measured with photon Doppler velocimetry and used to determine the pressure inside the liquid cell. This work focuses on the fascinating and unknown properties of water in extreme conditions. We established an advanced spectroscopy system that employs a nanosecond laser and streak camera, as well as a femtosecond visible and IR laser to understand the photophysics of various molecular probes in shock compressed water. The dye probes measure changes in viscosity, while the hydrogen bonding and dissociation of water itself can be analyzed with the femtosecond IR laser.

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