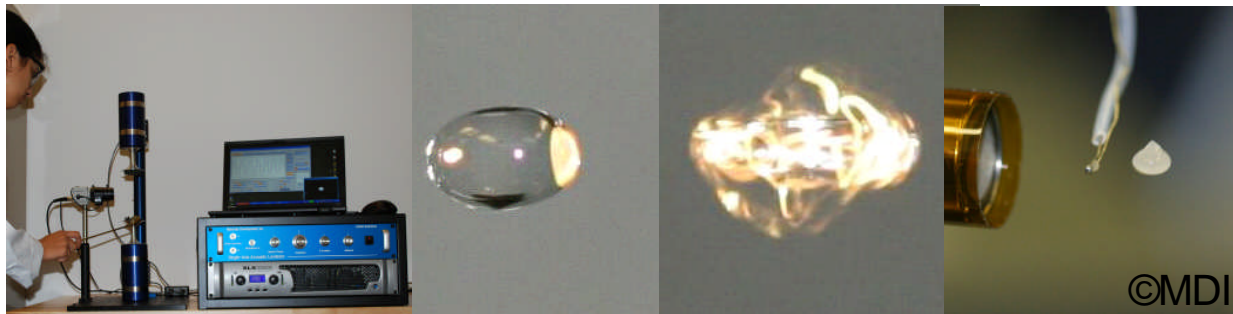




Single-axis Acoustic Levitator (SAL™)

MDI and Intersonics have teamed to offer the **Single-axis Acoustic Levitator (SAL™)**. The sample manipulator derives from NASA-developed technology for acoustic levitation in space and an early version was flown on the space shuttle.

The SAL enables non-contact positioning and manipulation of solid and liquid samples in the size range 1-3 mm and at temperatures from about -40 to +40°C where aqueous liquids and low melting materials can be studied. The SAL uses two vertically-opposed, high output acoustic transducers that operate at a frequency of 22 kHz and can produce sound pressure levels to 160 dB. The transducers are mounted in aluminum tubes and located on a metal stand. Samples are introduced into the "sound field" using a small syringe or a wire gauze spoon. Samples can be translated by adjusting the phase between the transducers or "squeezed" by modulating the acoustic levels with variable frequencies. The SAL can be operated on most horizontal surfaces and it can be integrated with laboratory instruments and/or beamlines to study materials *in-situ*.



Left to right: Single-axis acoustic levitator showing the transducers and the power supply with front panel controls. Levitated water droplet approximately 3 mm in diameter. Oscillating drop excited at a frequency of 90 Hz. Ice droplet formed in-situ, the 12 mm diameter Cryostream tube (left of the droplet) provides cold gas flow that cools the sample.

The SAL requires 125 V ac, 10 A electric power (other voltages available). The control unit is housed in a 19" (480 mm) rack-mountable chassis and the levitator head is located on a 12" x 18" (300 x 450 mm) optical breadboard. Cooling requires standard laboratory cryo-coolants such as liquid nitrogen or dry ice-acetone or a thermomechanical cooler.

For additional details please see: J.K.R. Weber, C.A. Rey, J. Neufeind and C.J. Benmore, "Acoustic Levitator for Structure Measurements on Low Temperature Liquid Droplets," *Rev. Sci. Instrum.*, **80**, 083904 (2009).

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