Accelerated Condensation in an Ultrasonic Field

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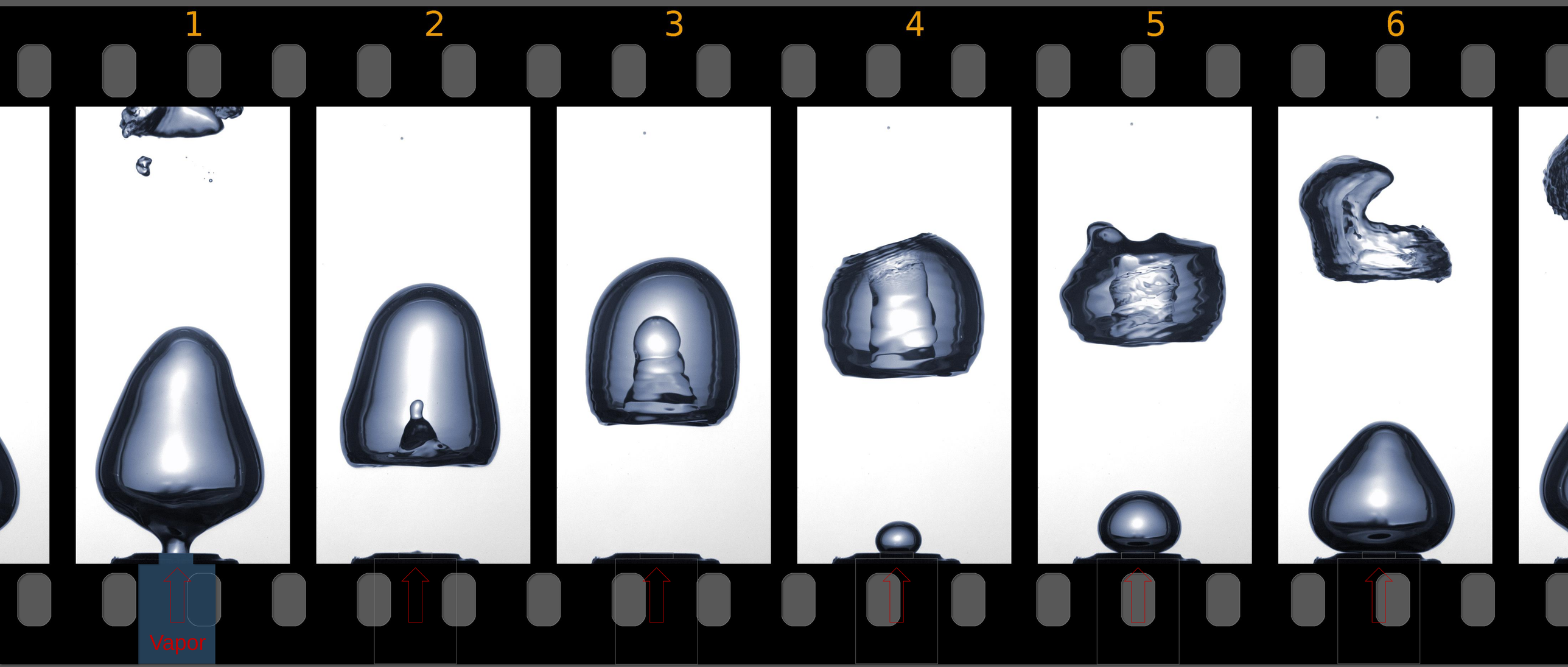
Base Flow

A train of vapor bubbles is formed by ejection into subcooled liquid pool. Surface tension pinch-off drives a liquid "spear" through the center of the vapor bubble to form a vapor torus that leads to rapid condensation.



Ultrasound

The liquid-vapor acoustic impedance mismatch is exploited for rapid reduction in vapor volume using a directed 1.7 MHz pulsed acoustic beam to force a similar liquid "spear," forming a vapor torus and accelerating the bubble collapse.