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COVER High-intensity ultrasound creates localized hot spots in liquids through the process of cavitation: the formation, growth, and implosive collapse of bubbles. Local heating produces excited states of diatomic carbon (C_2) from hydrocarbons; these states emit light just as they do in a flame. The images of such sonoluminescence from a vibrating titanium rod (1 centimeter long) is shown in false color. The temperature created in cavitation hot spots, determined from the spectrum of this emission, is ~ 5000 K. See page 1397. [Photograph by J. A. Gray, K. A. Kemper, and K. S. Suslick; University of Illinois at Urbana-Champaign]

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