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■ SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 1991 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$82 (\$47 allocated to subscription). Domestic institutional subscription (51 issues): \$150. Foreign postage extra: Mexico, Caribbean (surface mail) \$50; Other countries (air assist delivery) \$95. First class, airmail, student and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. **Change of address:** allow 6 weeks, giving old and new addresses and 11-digit account number. **Postmaster:** Send change of address to Science, P.O. Box 2033, Marion, OH 43305-2003. **Single copy sales:** \$6.00 per issue prepaid includes surface postage; Guide to Biotechnology Products and Instruments, \$20. Bulk rates on request. **Authorization to photocopy** material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$1 per copy plus \$0.10 per page is paid directly to CCC, 27 Congress Street, Salem, Massachusetts 01970. The identification code for Science is 0036-8075/93 \$1 + .10. Science is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

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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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Science **253** (5026), 1331-1437.

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