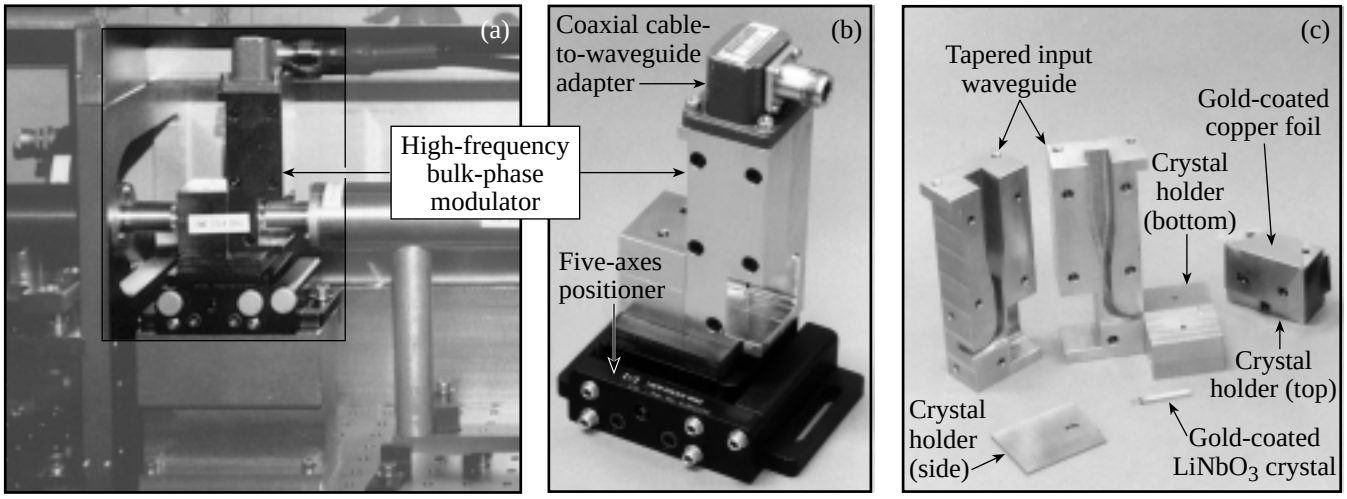
About the Cover:

The cover photograph shows Scientist Jonathon Zuegel (bottom) and Research Associate Douglas Jacobs-Perkins (top) aligning a double-pass, two-dimensional smoothing by spectral dispersion (2-D SSD) system that has been developed in the SSD testbed. The high-frequency bulk-phase modulator, highlighted in the lower left portion of the photograph, applies phase-modulated bandwidth to the laser pulse in the second direction of smoothing in the 2-D SSD system. Microwave power is delivered to the modulator from an LLE-built, 20-W solid-state microwave power amplifier that is fed by a microwave oscillator (shown at the right side of the photograph) operating at 10.4077 GHz. The solid-state microwave power amplifier will be replaced with a 1-kW traveling wave tube amplifier in order to generate the 1-THz UV bandwidth operation on OMEGA.



The three photographs shown above illustrate key aspects of the high-frequency bulk-phase modulator. (a) The integration of the modulator in the 2-D SSD system is highlighted. (b) The modulator is aligned in the 2-D SSD system with a five-axes positioner, and the microwave power is delivered to the modulator via a coaxial cable-to-waveguide adapter. (c) The internal structure of the individual components of the modulator is revealed. The crystal holder and tapered input waveguide sections are machined from copper to maximize electrical and thermal conductivity and are gold plated to prevent oxidation of the copper. All four sides of the $LiNbO_3$ crystal are gold coated to form a standing-wave waveguide resonator that is approximately $2 \bullet \lambda_{microwave}$ long, while the ends are antireflection coated for the SSD beam. The overall dimension of the crystal is 3.05 mm × 2.0 mm × 26.3 mm.

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For questions or comments, contact Sean P. Regan, *Editor*, Laboratory for Laser Energetics, 250 East River Road, Rochester, NY 14623-1299, (716) 275-7077; e-mail: sreg@lle.rochester.edu.

Worldwide-Web Home Page: http://www.lle.rochester.edu/