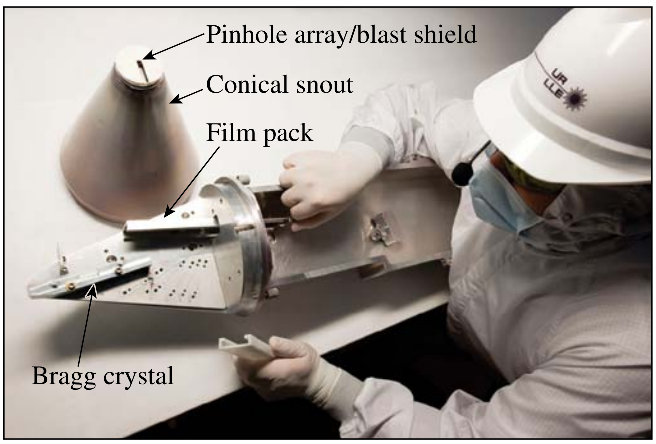
About the Cover:

X-ray, charged-particle, and neutron diagnostics are positioned in close proximity to an imploding Ti-doped, plastic-shell target filled with deuterium gas at the center of the OMEGA target chamber to characterize the high-energy-density plasmas created in laser-fusion experiments. The x-ray spectrometer (XRS) was used to measure the time-integrated multiple monochromatic images of the implosion (shown in the lower right corner) and diagnose the compressed-shell conditions. The green lines indicate the path of the x rays from the implosion to the XRS diagnostic. X rays propagate through an array of pinholes positioned in the tip of the conical snout of the XRS, are diffracted from a flat Bragg crystal, and are detected on film. The concept of combining a pinhole aperture with a Bragg crystal spectrometer to achieve multiple monochromatic x-ray images was extended to hundreds of pinholes on the OMEGA Laser System. It has been further extended to multiple views of the implosion to diagnose the spatial profiles of the electron temperature and density of the implosion hot spot. A flat Bragg crystal spectrometer with a pinhole array will also be fielded at the National Ignition Facility. Over the last three decades, x-ray spectroscopy recorded the remarkable progress made in inertial confinement fusion. The feature article (see "Applied Plasma Spectroscopy: Laser-Fusion Experiments," p. 55) presents a historical perspective of this development showing the seminal research and current state-of-the-art measurements.



LLE experimental operations technician Ben Ruth adjusts the film pack of the x-ray spectrometer (XRS), which is shown with the conical snout removed. X rays from the target propagate through the blast shield and pinhole array, diffract from the Bragg crystal, and are detected on film.

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