Place a cart in front of the center of the lecture table, set the laser on the cart, and tilt the laser upward so the beam strikes the screen near its center. (See WARNING.) Place the multiple grating holder in one of the two fittings nearest the laser. Darken the room somewhat. Turn the laser on and note the intense spot on the screen.

Single Grating: Four gratings are furnished, three coarse ones and one fine one. Insert in the beam the finer grating, with lines vertical, and observe several orders of reinforcement of the 5328 Å line of neon. Replace this grating with one of the three coarse ones, and note that the reinforcements are more closely spaced.

Two Gratings Crossed at 90°: Place in the beam two of the coarse gratings, with their lines crossed at 90°. Observe the rectangular array of reinforcement spots. This array illustrates the pattern formed by a beam of X-rays (or electron waves) passing through a thin crystal having a rectangular array of lattice points.

Three Gratings Crossed at 120°: Place in the beam the three coarse gratings with their lines crossed at 120°. Observe the hexagonal array of reinforcement spots. (See Note.) This array illustrates the pattern formed by a beam of X-rays (or electron waves) passing through a thin crystal having a hexagonal array of lattice points.

WARNING: Never allow the direct beam from the laser to enter the eye. Warn students that they should not look into the beam. If the laser is turned during the demonstration, be sure that the beam is never directed toward any student.

Note: The multiplicity of secondary spots close to the primary spots is due largely to reflections from the glass plates between which the grating replicas are mounted. These secondary spots move slightly as the grating is moved within its slot.