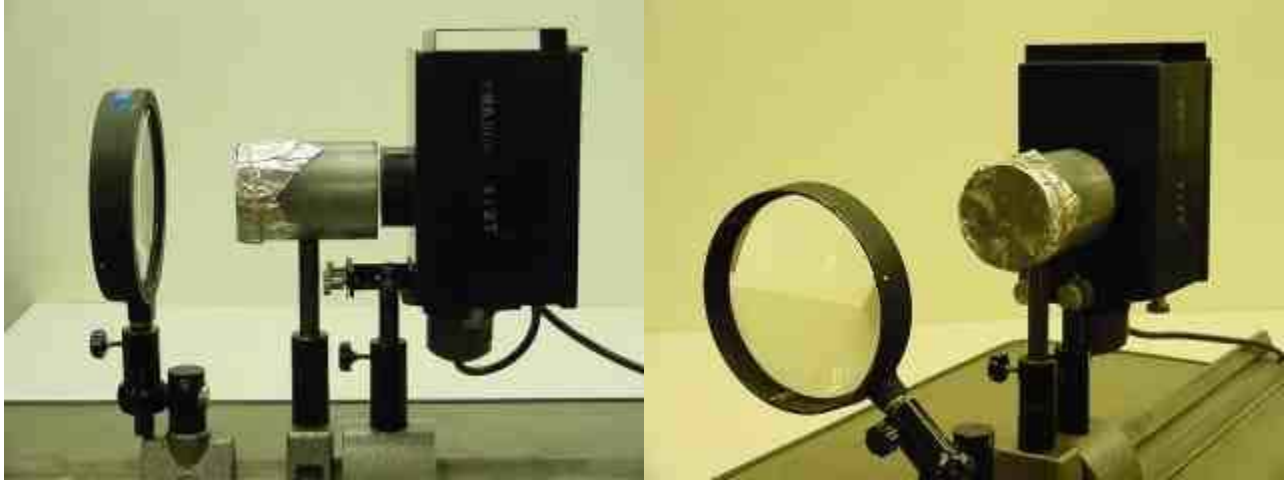
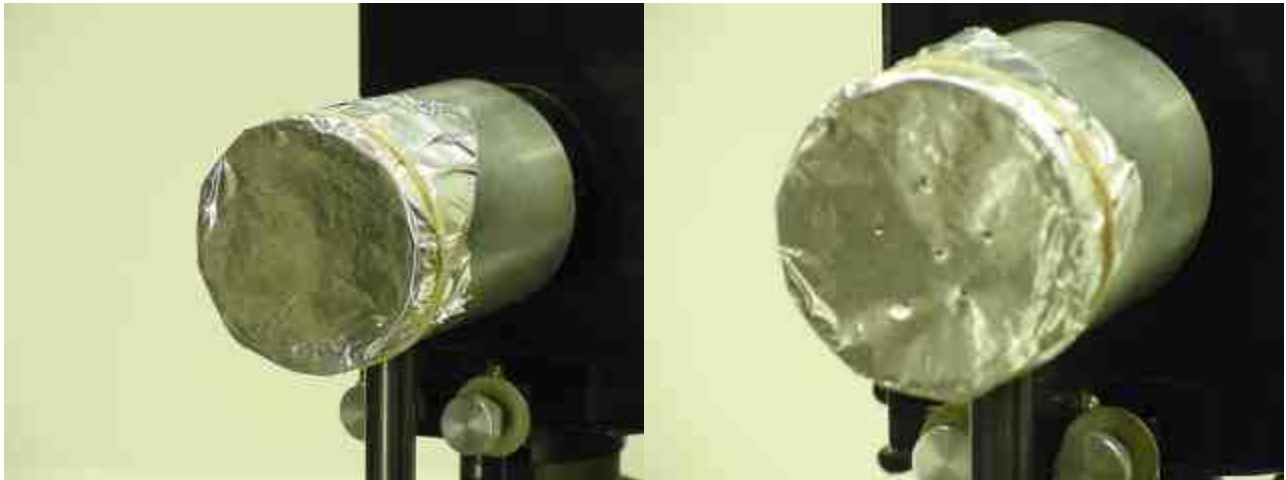


Question #230

Shown in the picture at the left below is an optical system consisting of a bright lamp with a filament formed from several nearly parallel lines (inside the black box at the right in the photograph), a tube that has been painted black inside to limit the amount of stray light, and a lens. The lens is positioned so that if an object were placed at the location of the filament, with the light aimed toward the screen, it would produce an image at the screen seen in the image photographs (1) through (6) below.



An aluminum foil is stretched over one end of the tube, as seen in the photograph at the left below, and several pinholes are made sequentially in the foil, as seen at the right.



The photographs below show the light on the screen after one, two, three, four, five, and six pinholes have been made in the aluminum foil. Each pinhole creates a "pinhole image" on the screen, with the lens removed.

(1)



(2)



(3)



(4)



(5)



(6)



Now the lens will be inserted into the path of the light along the optic axis of the system. The question here is what form the light will assume on the screen after the lens has been inserted.

After the lens has been inserted the light will form:

- (a) six fuzzy images, similar to those in the picture above.
- (b) six fuzzy images, but upside down from the ones in the photograph above.
- (c) a single fuzzy image.
- (d) a single fuzzy image, but upside down from those in the photograph above.

- (e) a single well-focused image.
- (f) a single well-focused image, but upside down from those in the photograph above.
- (g) a blurry unidentifiable image.

Click here for [Answer #230](#) after November 7, 2005.

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For questions and comments regarding the *Question of the Week* contact [Dr. Richard E. Berg](#) by e-mail or using phone number or regular mail address given on the [Lecture-Demonstration Home Page](#).