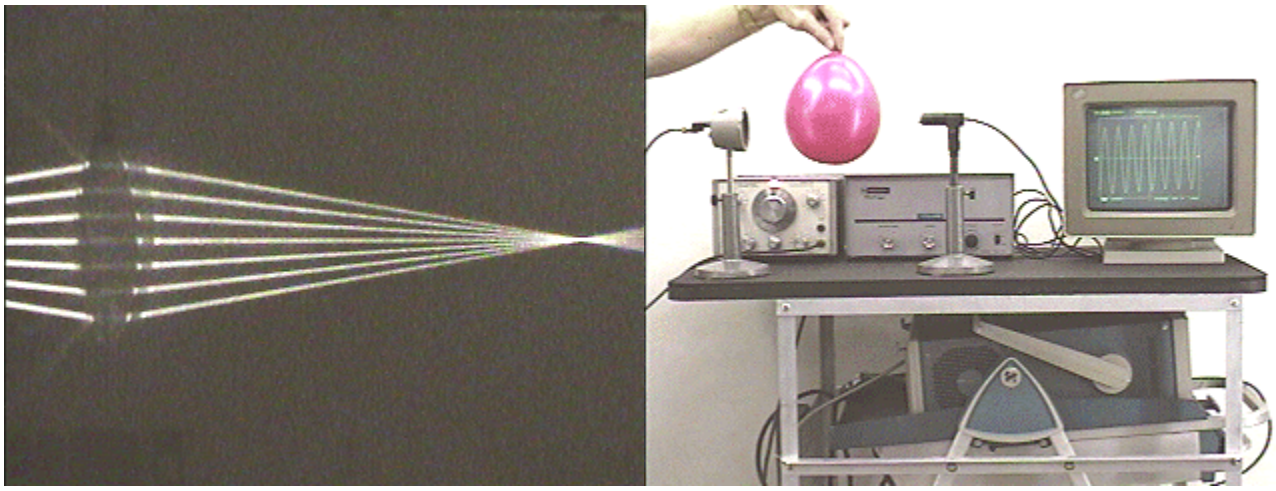
Question #141

A convex light lens, such as that shown in the photograph at the left below, bends light rays so that they come together at a point called the focus. This is achieved by making the lens surfaces convex using a material in which the speed of light is less than the speed of light in the surrounding air.



The same experiment can be performed with sound using a balloon as a "sound lens," because the shape of an inflated balloon is similar to that of a light lens. The experimental arrangement is shown in the photograph at the right above. Sound from the microphone, at the left of the balloon, is focussed by the balloon onto the microphone, at the right of the balloon.

Suppose that we fill three balloons with air, carbon dioxide, and helium, respectively (in alphabetic order). How well will these three sound lenses focus the sound to the microphone in the above setup?

Rank the three balloons in order of their focusing ability, with the most strongly focusing balloon first:

- (a) air.
- (b) carbon dioxide.
- (c) helium.

Click here for Answer #141 after March 3, 2002.

Question of the Week

Outreach Index Page

Lecture-Demonstration Home Page

UNIVERSITY OF MARYLAND 18 56 DEPARTMENT OF PHYSICS UNIVERSITY OF MARYLAND COMPUTER MATHEMATICAL & PHYSICAL SCIENCES

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.