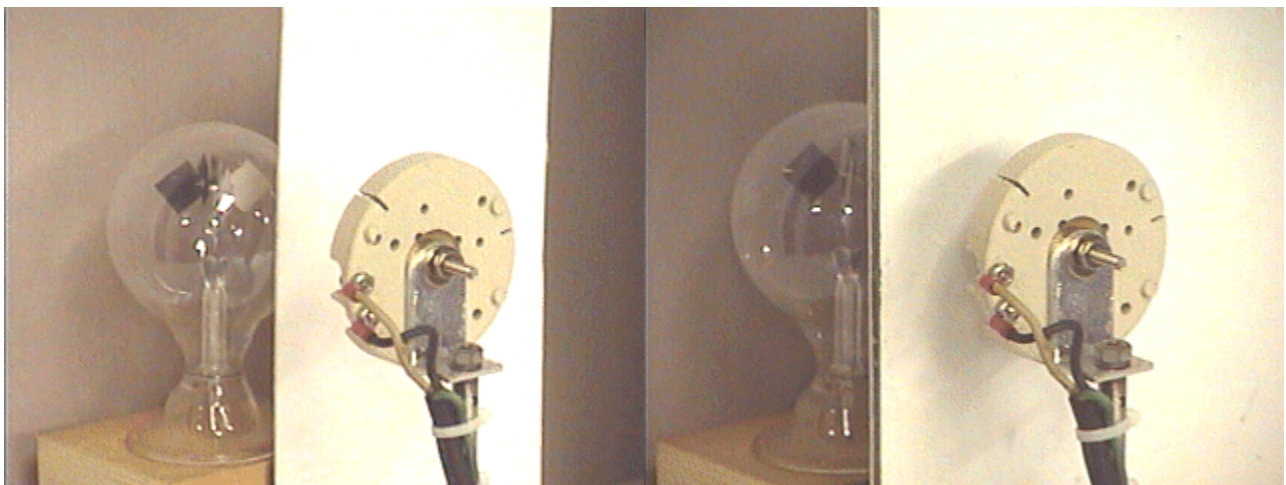


Question #173

The questions for this week and next week concern the *radiometer*, a sort of physics toy shown in the two figures immediately below. A standard radiometer has four vanes, each with one side black and the other side white, as seen in the detailed photograph at the right below. The suspension has very low friction, so a small amount of force on one side of the vanes will cause the device to rotate. If you shine a heat lamp or some similar source of heat and/or light onto it, the device spins with the white surfaces leading and the black surfaces lagging.



In the photograph at the left below, a type of heat lamp made from coils of nichrome wire is brought near the radiometer. If its radiation is directed at the radiometer, the device will begin to spin rather rapidly, as can be seen by clicking your mouse on the photograph at the top left of this page. A heavy metallic screen painted white is inserted between the heater and the radiometer, as seen in the photograph at the right below, and removed when the heater is fully warmed up, so the radiometer is immediately blasted with the maximum heat intensity at the beginning of each experiment. Exactly how the radiometer works will be the subject of the investigation this week and next.



Suppose that you use a section of white cardboard, seen in the photograph at the left above, inserted between the heat source and the radiometer so that the heat will shine on the *black* sides of the

paddles but not on the *white* sides. What will the radiometer do when it is illuminated by the heat lamp?

With only the black sides of the radiometer vanes illuminated by the heat, the radiometer will:

- (a) rotate significantly faster than when both sides of the vanes are illuminated.
- (b) rotate about the same speed as when both sides are illuminated.
- (c) rotate significantly more slowly than when both sides of the vanes are illuminated.
- (d) remain motionless.

Click here for [Answer #173](#) after February 2, 2003.

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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](#).