Density

Twinkle, twinkle, little laser

Recreate the shimmering light from distance stars and galaxies in the laboratory

You will need….

- ✓ Laser
- ✓ Candle
- ✓ Screen

Background:

A laser beam passes over a lighted candle and produces a twinkling spot on a distant screen.

Follow these steps:

1. Set up the laser so that its beam passes over the candle flame.
2. Observe the spot on the distant screen.
3. Gently blow the flame.
4. The spot will visibly move.

So what happened?

Why should laser light and candlelight seem to interfere?

Laser light travels in a straight line when travelling through a medium of uniform refractive index.

The heat from the flickering flame causes the density and the refractive index of the air to change and so the laser spot dances on the screen.

What next?

1. The demonstration describes clearly why stars twinkle. When you look at a star you are viewing it through the layers of the earth's atmosphere. These layers have different densities and are not stationary. This causes the starlight to fluctuate.