**PROFESSOR:** In a previous demonstration on two-beam interference, we saw that the fringe pattern was a series of vertical lines. The reason was that the two beams were plane waves. And the lines were due to the interference of two plane waves with a slight angle between them.

In this demonstration, we're going to show that you can get all kinds of shapes in the fringe pattern by simply placing a lens in the setup. And here is the setup. As you may recall, here's the laser. Here's the beam from the laser being reflected by this mirror. And, here, we're going to add a lens.

The light coming out of the lens and reflected by this mirror here will have some curvature now. And when it enters the Michelson interferometer here, the beam going to this arm being the longer arm-- slightly longer arm-- will have slightly different curvature when it interferes with the beam coming from this arm, because the path length here is shorter than this one. The two beams will interfere and pass along this direction. Then they will get reflected at this mirror through the lens and then onto the screen.

So, now, if we take a close-up at the fringe pattern, we will see that we have circular fringes. And what's interesting about the circular fringes is that the spacing between the fringes can be changed by disturbing the setup. For example, if I change the length of this arm here, I can change the spacing between the fringes, because I'm getting closer. I'm closer to the same curvature as in the other arm. If I go further, again, we can see that I can increase the number of fringes, showing that, again, the curvature has changed relative to this fixed arm over here.

Now, I'm going to show the effect of misalignment on the circular fringes. If I adjust this mirror to here, and then let's again look at the fringes, and then you can see that by misaligning this mirror, I can get arcs instead of the bullseye. And, in fact, if I look closely at the arcs, I can tell which way the beams are misaligned.

All right. Now, what I'll try and do is to try and make the field go all dark or all bright by making the two paths as identical as possible. Now, you can see, I only have about a couple of fringes in the interference pattern. They're slightly misaligned. So I have them a little better centered.

So let me close in one path, and then see if I can get complete darkness or complete brightness. Let me adjust the alignment as I move in. Here, you can see I'm getting close to equal path. And then a little bit more. Not quite.

That's almost-- we're almost there. You can see, if I press on the table, you can see the screen going bright and dark. I think I have a little bit to go. And maybe we can get complete extinction. Let's see. This is pretty close to a complete extinction.

So in this brief demonstration then, we've shown that you can get circular fringes, bullseye, arcs, and what have you, by simply making the input beam to the interferometer have some curvature. And by adjusting the path length difference between the two arms, you can get a variety of fringe systems.