

## **Total Internal Reflection Lab**

Shine a laser beam into a tank of water from the bottom. SPIE donated a nice tank with a rotating laser. Shine the laser so that it leaves the water at the surface. Then change the angle so that the light leaves the surface of the water at a small angle with respect to the water surface. Continue to decrease the angle until the light no longer leaves the surface, but is reflected by the surface of the water and goes back down. This is called total internal reflection. Find the angle at which the transition takes place from light leaving the surface, to reflecting back into the water. This is called the critical angle for total internal reflection in water.

Light that travels in a fiber optic cable strand will stay in the strand unless the cable is bent beyond the critical angle, because it is totally reflected back inside when it hits the sides.

Look up the critical angle for total internal reflection for water online or in a book and see if your measurements agree.

Write-up criteria: (in word, then e-mail as an attachment to [sshumway@sanjuanschools.org](mailto:sshumway@sanjuanschools.org))

### **Required elements of lab write-up.**

Discussion of how well your measurements agree with published info.

Explanation of Procedures

Measurement of critical angle

What is one reason fiber optic cables have to make gradual corners?

