#### Supplement to Marsh White Award Report 2014

Society of Physics Students at New Mexico State University

**Gravity simulator** 

Please refer to <a href="https://www.youtube.com/watch?v=MTY1Kje0yLg&app=desktop">https://www.youtube.com/watch?v=MTY1Kje0yLg&app=desktop</a>

For our goal with this experiment.

## Purpose:

We built a gravity simulator using a sheet of spandex stretched evenly over a large PVC tube. This was constructed to improve and update our pre-existing, and future outreach events. The gravity simulator gives students an interesting perspective of how massive objects warp space-time around them.

#### **Apparatus:**

Our gravity simulator is made up of two parts: A rigid PVC skeleton and a stretchy and flexible spandex surface. The PVC skeleton (as shown in the pictures) is attached to a ring of rebar inside a common garden hose to provide a surface for the spandex to lay evenly along.

The spandex sheet is then stretched evenly across the ring. Once an even surface is attained, a weight on the order of one to five kilograms is set in the center of the spandex, creating a cone shaped "gravity" gradient. Any round object will be inclined to roll toward the weight in the center. This "attractive" force, when combined with a motion tangent to the ring, will result in the round object "orbiting" the weight in the center, thus simulating a gravity field like that of a solar system.

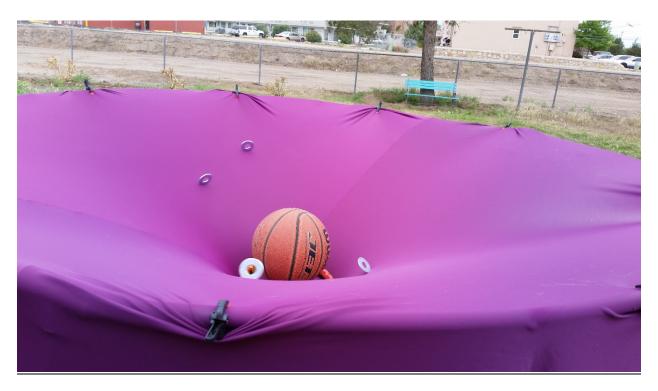
More round objects can be added to the surface, and each object will exert a "gravitational" force on one another. This can result in complicated motions. For example, motions like marbles orbiting marbles while both marbles orbiting the center weight.

### **Pictures Below**



# **Frame**





**Gravity Simulator in action** 



**Gravity Simulator in action** 



**Gravity Simulator in action**