



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Eric Casavant; Alex Marshall	Project Number S1603
Project Title Measuring the Speed of Gravity using Ocean Tide Models in Conjunction with Solar and Lunar Position Tracks	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The speed at which gravity (or the graviton) is exchanged is one of the last unknown fundamental constants of nature.</p> <p>Methods/Materials By using ocean tide data in conjunction with solar and lunar position data, we can measure the speed of gravity.</p> <p>The height of the tide implies a position of the sun and moon, because the tides are primarily caused by solar and lunar gravitational gradients. Let this position be known as the "tidally implied" position. We can then find the position of the moon and sun implied by visual evidence or an ephemeris. Let this be known as the "visually implied" position. Any difference between the tidally implied and visually implied position of the sun and moon can be accounted for by a difference between the speed of light and the speed of gravity.</p> <p>Results Our results indicate that gravity is exchanged nearly instantaneously.</p> <p>Conclusions/Discussion If our experimental results are correct, we have placed severe limits on Brane Theories and Superstring Theories. However, we would like to collect more data and run further error analyses to reduce our margin of error and increase our certainty.</p>	
Summary Statement We measured the speed of gravity (the speed at which gravitational force is exchanged between two objects).	
Help Received Teacher and Father helped with validation.	