



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Dylan J. Sanfilippo	Project Number J0814
Project Title Measuring the Interplanetary Magnetic Field with a Homemade Magnetometer	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I visited Astro Camp for several days on a field trip and it inspired me to do a science fair project about space, our sun, and our solar system, so I searched for ideas on the internet. I found a very interesting project to measure the magnetic pulses in the interplanetary magnetic field. My goal was to build a device called a magnetometer, which acts as a compass that measures the interplanetary magnetic field. The interplanetary magnetic field is made up of plasma emitting from the sun to create solar wind.</p> <p>Methods/Materials The magnetometer I built was constructed of rare earth magnets that are attached to a fiber with a laser beaming off of it. My hypothesis was that I would be able to measure the interplanetary magnetic pulses. I believed the results and graphs from my magnetometer will be in principal similar to devices used by NASA. I thought there would be some errors because the device is homemade. I used a program on the computer to calculate and translate the laser results from my device into a graph. I recorded 115 hours of test data.</p> <p>Results I found that 59% of the time, my graphs were similar to NASA's. I concluded that I could measure the interplanetary magnetic field with accuracy a little more than half of the time with a homemade magnetometer.</p> <p>Conclusions/Discussion The percentage that I received from my graphs could have been affected by appliances in my house. For example, my refrigerator or any other appliance with an electric and magnetic field, would interfere with the rotating magnet. Even a small degree of rotation would show a lot in the graphs I made. To fix this problem I would build a glass box for wind protection, and place my project outside away from my house appliances. Building the magnetometer was complicated but when I was done I felt successful and excited to measure the interplanetary magnetic field and make the graphs on the computer. I really enjoyed my project and I want to continue my scientific studies in earth and interplanetary sciences.</p>	
Summary Statement I built a homemade magnetometer to measure the interplanetary magnetic field.	
Help Received Mother for encouragement and inspiration; Father helped with oral report; Science teacher for her guidance	