



CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY

<b>Name(s)</b> Aidan L. Brem	<b>Project Number</b>  34594
<b>Project Title</b> Testing the Accuracy of a Homemade Magnetometer in Tracking Solar Flares	
<b>Objectives/Goals</b> Abstract I was led to this project because I have always loved heliophysics, and I have always loved researching the sun in general: I have always wondered about the solar wind, solar flares, Coronal Mass Ejections, and other phenomenon on the Sun. I began working on a magnetometer to see if I can record these phenomenon. My hypothesis was that my magnetometer could detect differences in the solar wind as fine as 0.1 keV, and detect 90% spikes that went over 25 keV. <b>Methods/Materials</b> I used two neodymium magnets, two mirrors, and a laser pointer for the basic components for my magnetometer. I wrote a program to track the laser and make a graph of how much it moved. I then let my magnetometer run for 12 hours every night, and have accumulated over 240 hours of results. <b>Results</b> My results were very surprising. When compared to NASA's data, my magnetometer could detect differences in the solar wind as fine as 0.5 keV, and it could detect 85% of the spikes in the solar wind that went over 25 keV, and also detected 65% of all spikes that went over 15 keV. <b>Conclusions/Discussion</b> I had a lot of fun doing this project. While my results show that my magnetometer should detect all differences over 15 keV, it couldn't detect a spike that went over 18 keV. If I were to do this project again, I might try using different magnets as the core, different types of coins as the control, and try to eliminate all different magnetic disturbances nearby.	
<b>Summary Statement</b> The goal of my project was to construct a magnetometer that could detect and record differences in the solar wind as fine as 0.5 keV and track solar flares.	
<b>Help Received</b> Father helped me gather materials, Grandpa was my safety advisor, Mother lent me computer for testing and Grandma took pictures of my project.	