



CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

Name(s) Michael M. Lu	Project Number 34572
Project Title Is There an Absolute Hot?	
Objectives/Goals The objective is to determine whether or not the actual absolute hot temperature, if it exists, is confirmed by experimental data to occur at the theoretical absolute hot temperature (Planck Temperature, approximately $1.417 \cdot 10^{32}$ K). Abstract Methods/Materials Experimental temperatures found on the Internet were recorded on a spreadsheet. Then, using the equation $(1/2)mv^2 = (3/2)kT$, which was modified for relativistic velocities, I calculated the particle velocities at these temperatures. Finally, after verifying my calculations, I plotted my data and attempted to use appropriate curves to fit my data. From these curve fits, I approximated where an absolute hot temperature would occur according to experimental data (i.e. where the particle velocity approached nearly the speed of light). Results From power and logarithmic regressions as well as an average of these two regressions, I discovered that experimental temperature data revealed an absolute hot temperature that would occur several magnitudes of order below Planck Temperature. Conclusions/Discussion Planck Temperature may be too many orders of magnitude away from current experimental temperatures to be the actual absolute hot. From my experimental calculations and curve fits, I have found that there may be a clear relationship between my experimental temperature data and the speed of light as a limit to velocity. It seems that absolute hot temperature, if it exists, may occur at a temperature much lower than Planck Temperature.	
Summary Statement My project attempts to show that the actual absolute hot temperature, as determined by experimental data, may occur several orders of magnitude below Planck Temperature, the theoretical absolute hot.	
Help Received Mother helped me work with Microsoft Excel and prepare display board; Advisor helped with ideas and tips to continue my experiment and research	