



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Rishika Singh</b>	<b>Project Number</b> <b>S1925</b>
<b>Project Title</b> <b>Twinkle, Twinkle Little Star, How I Wonder How Old You Are: Exploring Stellar Evolution of the Open Cluster Population</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My objectives are to (1) calculate the age of Monoceros R2 by producing an H-R diagram, (2) to find a correlation between the ages of clusters in existing literature and their galactic coordinates, distance, diameter, and height. <b>Methods/Materials</b> (1) After obtaining an account and acquiring a time slot, access the Faulkes Telescope in order to capture images of Monoceros R2. Then, complete the photometry and produce the H-R diagram using Microsoft Excel. Conduct the same procedure for nine other clusters, three clusters from three different age groups (young, intermediate, old). Acquire the information for each cluster on the WEBDA database. <b>Results</b> (1) The H-R diagram for NGC 1976 (7.11 years in log age, one of the young clusters) was most alike to Monoceros R2, therefore they were of similar age. (2) Galactic latitude, longitude, and distance were insignificantly correlated with the age, as shown by the low correlation coefficient and high p-value. With the high correlation coefficient and low p-value, the diameter versus age and height versus age relationships were significantly related. <b>Conclusions/Discussion</b> (1) The estimated age of Monoceros R2 is 13 million years old, or 7.11 years old in log age. (2) Height and diameter were correlated with the age, while galactic longitude, latitude, and distance were not. Therefore, my hypothesis concerning distance versus age was incorrect, while the height versus age prediction was proven to be true.	
<b>Summary Statement</b> Age was calculated for the Monoceros R2 cluster and physical characteristics of open clusters were compared with their age.	
<b>Help Received</b> Parents helped with data analysis and presentation; Dr. Rachel Street and Ms. Jessica Barton (LCOGT) helped with question formulation, procedure, analysis methods, and background information, software installation, online projects, and program usage; Mrs. Kim Miller helped with background and analysis.	