



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Thomas A. Radujko	Project Number J1814
Project Title Can Light Curves Determine the Outcome of a Supernova?	
Abstract Objectives/Goals The objective of this project is to determine if the light curve of a type 1A supernova compared to the light curve of a stellar mass black hole can help predict that the supernova will become a black hole. Methods/Materials FITS file stacking and converting program (IRIS/DS9), photometry analysis program (Salsa J), LCO global telescope network, Windows 7 computer. I did not modify the three downloaded programs used to conduct my experiment. Converted, stacked, and analyzed FITS files of Gaia 16 bq1 (supernova) and 1118 Rosa (black hole) to produce two light curves for comparison. Results Light curve graphs were compared and showed no correlation, though the data was inconclusive because the black hole and supernova were of varying sizes and the time period during which the images were taken was not at the very end of the supernova's magnitude decay or the formation of the black hole. Also, the x-scale (time when image was taken) units on the graphs of the supernova and black hole light curves were different. Conclusions/Discussion The light curves being compared appeared to have no effect in predicting the supernova's outcome. Though this statement is not conclusive because my results were not statistically significant due to differences between these celestial bodies' formation and size.	
Summary Statement My results showed that a supernova's light curve cannot help determine if that supernova will form a black hole (as its outcome), though they were inconclusive and not statistically significant.	
Help Received I converted, stacked, analyzed, and produced the light curves of the FITS files myself, but spoke to professor Omar Blaes at UCSB and Dr. Curtis McCully in the supernova division of the LCO headquarters. Also, the astronomer Fraser Louis helped me find the black hole FITS files. Finally, my	