CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
36247

Project Title
Spectral Type and Frequency Correlation in Stars

Abstract

Objectives/Goals
The main objective of this project is to determine whether there is a clear correlation between the spectral type of a star, and the frequencies of light it emits (color).

Methods/Materials
An astrophotography setup consisting of a 130mm aperture reflector telescope, a motorized mount and a DSLR camera was used. Images of many different stars of many different spectral types were taken. They were analyzed with a freeware software program known as Registax using specific wavelet tools that relate to the color distribution of an image.

Results
In data set 2, when the 20 imaged stars are put into sequential order based on their spectral type, they form a concise pattern. In the O-B range, they start with a deep blue color. In the B-A range, they have a bluish-white hue. F stars have a white color with a hint of pale blue. Ignoring Aldebaran, K type stars have a pure white color. G type stars have a white color with a tinge of orange, and M type stars range from reddish-orange to completely red. Aldebaran, which is present in both data sets, has an orange color that is an outlier. Data set 1 confers with these results.

Conclusions/Discussion
Using the compiled results, the correlation laid out by the hypothesis was confirmed. A color change from blue to white to red was found between different spectral types. The ground the hypothesis was based on, such as the charts and tables commonly found in textbooks and resources, were correct with the slight variation between stars.

Summary Statement
I used an astrophotography setup to demonstrate a correlation between the spectral type of a star and the frequencies it emits.

Help Received
None. I worked out the telescope configuration for each data collection myself, researched the stars to be imaged, and analyzed them myself.