

" Supernova Classification Using Swift UVOT Photometry"

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With the great influx of supernova discoveries over the past few years, the observation time needed to acquire the spectroscopic data needed to classify supernova by type has become unobtainable. Instead, using the photometry of supernovae could greatly reduce the amount of time between discovery and classification. For this project we looked at the relationship between colors and supernova types through machine learning packages in Python. Using data from the Swift Ultraviolet/Optical Telescope (UVOT), each photometric point was assigned values corresponding to colors, absolute magnitudes, and the relative times from the peak brightness in several filters. These values were fed into three classifying methods, the nearest neighbors, decision tree, and random forest methods. We will discuss the success of these classification systems, the optimal filters for photometric classification, and ways to improve the classification.