# Digital Nova Searching

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**Abstract** Using a simple 35-mm camera lens attached to a CCD camera mounted piggyback on a telescope, one can image large areas of the sky to look for novae.

## 1. Introduction

I have developed a method to search for Novae along the Galactic plane using a simple 35-mm camera lens of 50-mm focal length and a Starlight express HX516 CCD camera. This method allows one to cross reference any image of a zone with any other image of the same zone taken at another time.

## 2. Discussion

The exposure time of each image is 40 seconds; no filters are used. The magnitude limit is about 13; the field size is 5 degrees wide by 4 degrees high. Each exposure is recorded manually on paper with a list of the zones, time, and the camera frame number. The center star of each zone is a known SAO star found by using a computer program called GUIDE 8, available on the internet. The center star is also listed on the paper record.

The camera is mounted piggyback on a 14-inch Meade STC. The telescope is programmed with the SAO star number and a simple "Goto" instruction is given to send the telescope to the proper zone. When the telescope has been positioned, an exposure of 40 seconds begins while the next zone is being programmed into the computer. I am imaging 116 zones along the entire Milky Way.

All of the images are processed in AIP4WIN image processing software (Berry and Burnell 2000). Images are brought into the program and are processed to bring the background to the same level. No dark or flat fields are used, since they are not needed; the purpose is to find a new star in a field.

Image subtraction is used to see what is new on one of the images. There are many suspects and if they look strange then the images are blinked—this is how you find the new star if one is there. It takes about 1 hour and 50 minutes to do this to 28 fields. The process can also be automated but I prefer to do the work this way.

## 3. Conclusion

Anyone who is interested in setting up an observing program such as this may contact me at the above address or by email: micmattei@comcast.net. The AAVSO also has a Nova Search Committee and program; see http://www.aavso.org/observing/programs/nova/ for information

I have come across all types of variables including Miras, eclipsing binaries, and Cepheids, and I have found one long period variable which is not on the AAVSO program. It has a visual magnitude range of 10.19–10.43, and it turns out to be a known variable, ASAS 190833+0325.8. The location is R.A. $19^h\ 08^m\ 32^s$, Dec. +03° 25' 46". This shows that the program works. Now all I have to do is find a nova!

## Reference

Berry R., and Burnell, J. 2000, "Astronomical Image Processing Software," version 1.4.25, provided with *The Handbook of Astronomical Image Processing*, Willmann-Bell, Richmond, VA.