Sunday, March 11, 2018

Visible Spectrum Experiment .. Autocorrelation (Wave Optics)

I made my first deductions and arrived in just a few minutes on the precise data, after modifications of my image intended to be projected for an optimal result.

Many are the data contained in the spectroscopic readings.

Only the spectral resolution that characterizes them is often very weak, which is constraining compared to their analysis.

Indeed, the effectiveness of conventional techniques in detecting the average modulus of a stellar magnetic field is limited by the resolution of the spectra.

From a photo of the moon and the deep sky not apparent (stars)

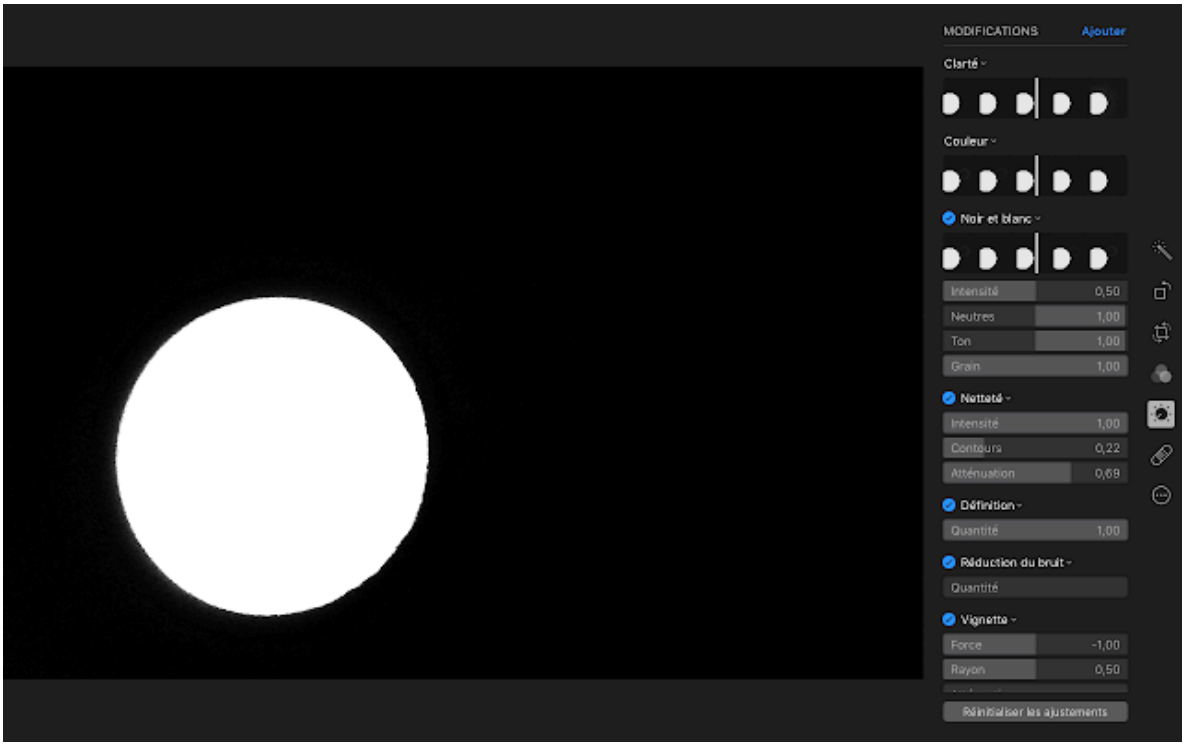
I've do the imaging of stars by intercorrelation.

Detection of weak stars by autocorrelation of photographs.

The experimental results obtained by autocorrelation of numerous plates of a given star field are presented.

The granularity of the photographic image is very small and a large gain in the detection of weak stars is obtained

The photo has been very little manipulated, without any specific software.



This is not intended for pro work but it is a first step of observation for my research and the expected result was obtained without harm and without delay. Moreover, the number of data obtained is incredible!

I am extremely surprised by the way the work is going. It's very eclectic.

When I start a search, it triggers via a simple term.

(Word considered in its designation value, especially in a specialized vocabulary)

Are carried out after the heaps of connections, in my opinion: logical.

I arrived quickly on results.

Inter-correlation between two scintillation images:

youtu.be/jWwZHs0-sy4

In a pictorial way the fundamental idea of this method is to remove the light which has not been deviated by the object.

(for example the studied fluid)

Indeed only the rays deviated by it correspond to turbulence or high spatial frequencies in optics.

To achieve this, one must first make an image of the light source using a converging lens.

At the precise location of the geometrical image, rays that have not been deviated (zero spatial frequencies) are passed.

They are removed with a filter.

The other rays which have been deflected, are not focused in the same

place and can therefore pass in order to form a filtered image.

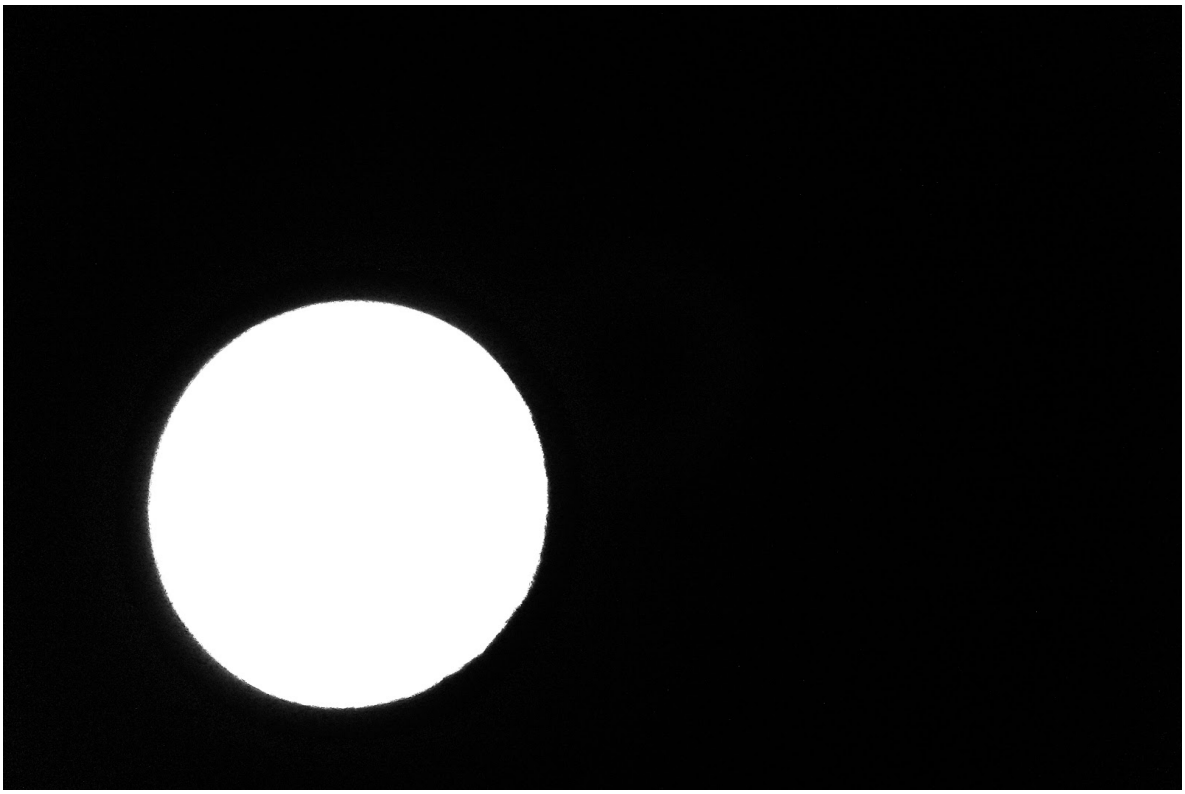
So, the continuous background of the image is eliminated and, consequently, the details or turbulence of the object, which were "drowned" in this continuous background, have a greatly improved contrast.

In the example of the turbulence of a fluid, the image formed is black in the absence of turbulence, and bright in turbulent places.

youtu.be/mG5TCEPdfO0

Now , you can see ... Stars appeared in the photo below *_*

You can enlarge in your computer.



flic.kr/p/2427AdC

I plan to study a new technique of spectral analysis applied on the magnetic stars by making use of the function of autocorrelation.

This method provides the ability to detect in unpolarized spectra of a magnetic field.

This is a good performance given that the use of a conventional technique requires a spectral resolution of nearly 60,000 to detect line separation caused by a magnetic field of similar strength.
According to the author, the analysis shows the impressive performance of the technique with respect to photon noise polluting the signal of the star spectra.

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Posted by Veronica IN DREAM at 5:13 PM