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This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

## **Getting Started with Webcamera Observations**

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Translated by Robert Sadowski

Although I teach physics for two years only, I used to be a fan of astronomy as long as I can remember. Unfortunately, for the long time I could not carry on any observations of my own for the very simple reason - the lack of appropriate equipment. Therefore my first experience I could gain only when I began to work at school. When I have learned that I can have a telescope at my disposal, I could not be more happy indeed. In fact, this appeared to be very simple refractor with diameter of 80 mm and focal length of 90 cm but it had one great advantage - the electric tracking system.

I have gathered around me a group of similar fans of astronomy (speaking the truth, I did not have to look for them very long) and we got to work. Soon it became evident that a good part of my pupils was much more advanced in the astronomical observations than I have ever been, so we began to teach each other mutually.

Already in the first year of our activity the great astronomical event - the transit of Venus across solar disc - has occurred, on which occasion we have arranged at school the Venus Day. It comprised observing the event with three different telescopes until the noon, and later we had an astronomical quiz and a small school conference with presentation of the pupil's own works. Our enterprise have met with great interest of the pupils as well as of the school staff.

In those times we were not yet acquainted with webcam astronomy, so all our pictures were taken with standard SLR cameras only. During my work at school I soon realized how important the teaching of astronomy can be. I teach the classes for the lower course (gimnazjum) as well as for the higher (liceum) one, both mathematical and so called humanistic types, and everywhere I see one thing in common - the prevailing drive to understand the Universe.

When I have at last collected all the equipment, necessary for the webcam observations, I decided to try it at first experimentally at home, just to get ready later for the serious work at school. Because I have no car of my own, I had to carry on the observations simply out of my home window. First I was afraid that its situation in the centre of the big city may be a serious hindrance, but soon it proved that for the real enthusiast there are no unconquerable problems, so I could safely get to work. Of course, I was not aware then about many useful tricks which really facilitate the observations; here I would like to share with you my present knowledge about them.

Looking now back at those times I can see that my first photos were total failure (as to their quality), but I was so happy of taking them that I did not care for it at all. Actually, I even believed they were quite good. Maybe it was so because I haven't ever had seen any other pictures taken with webcam.

The object of my first webcam picture was Jupiter. I was really beside myself of joy when for the first time I saw on the screen that planet and its four satellites. The final picture was overexposed and completely out of focus, but I did not care and sent around its copies to all my friends, boasting of it naively. Today I would rather hid it well and wouldn't show it to anybody, simply out shame. Nevertheless, I have decided to show here some of my (better or worse) hitherto taken pictures, just as an illustration of results of my work.

Next object which I have managed to take picture of was the Moon. I was really amazed how big it was - much bigger than the screen could contain - and only then I have realized that the CCD in webcam is definitely much smaller than the eye-piece of a telescope. With this, however, another problem has emerged - the glass surfaces of the astronomical tools should be absolutely clean while my equipment, in particular the telescope which for many years stood unused and forgotten in the corner, was rather dirty so apart from the craters on the Moon I could

see numerous additional spots and stains, deteriorating terribly the image quality. Fortunately this could be solved rather easily, removing the dirt with strong current of compressed air.

It is also useful to have your telescope equipped with tracking system. Although it is not necessary in the beginnings, for taking pictures of such objects as the Moon or Jupiter, for example, but soon you will realize that quick escape of the objects off the field of view makes keeping them in focus very difficult. The image quality may be also seriously spoiled by poor atmospheric seeing and even the smallest stir of the telescope, caused by accidental touching of its body. I do recall myself how in the beginnings I used to run permanently from the telescope to the computer, trying to adjust the focus and checking sharpness of the image on the screen. Many times, exhausted by that running, I have lost the object from the field of view and I was forced to find it again. It was so tiring and time-consuming procedure that even such an enthusiast as me could feel sometimes discouraged. Fortunately, these were the passing moments of doubt only and soon I could get back to work again.

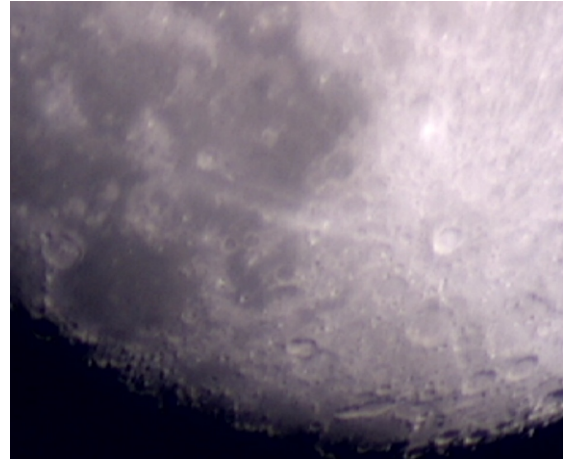
Of course, now I got much wiser and know that to set the telescope in focus may be done even at the daylight or immediately before the observation, aiming it to some distant earthly object, such as TV antenna or street lamp post.

The quality of my pictures still improves but I would not dare to call them ideal yet. Me and my pupils still have to work on their quality, all the more because after taking the pictures they have to be processed, and this is also very long and hard procedure. Anyway, it brings my pupils a lot of fun and satisfaction, and this is good, for we do it all just for them, to say the truth.

Bringing this letter to a close, I would like to encourage all my colleagues to introduce the webcam astronomy to their school practice. Please, feel free to send me all your questions and problems. My email address is: [feleks@poczta.onet.pl](mailto:feleks@poczta.onet.pl).



Rysunek 1: Jupiter. (Left) One of my first pictures of this planet (Right) More recent picture of the same object



Rysunek 2: The Moon. (Left) One of my first pictures (Right) More recent picture