

ERASMUS+ 2017-1-ES01-KA219-038074_1
OUT OF THE DARK: ASTRONOMY AS UNIFYING THREAD FOR CULTURES.



Solargraphies

Introduction

This project consists of recording the movement of the sun in the sky during a period using a technique available to students both for complexity and economic cost. This activity is designed for students of Geography and History of 1º ESO (11 and 12 years). It serves to explain the basic operation of the Optics, including knowledge of Physics and also of the construction of dark cameras, so it is useful for Art History.

Solargraphy is a photographic technique that uses photographic paper without revealing development and a pinhole camera to capture images that collect the sun's daily journey through the sky through very long exposure times, between several hours and many months. The result is scanned with a computer.

His creation is generally attributed to the Spanish photographer Diego López Calvín who, searching a way to capture the sun in photography, contacted the Slawomir Decyk and Pawel Kula. His collaboration was reflected in the "Solaris" project that laid the foundations of the new technique and created the name "solargraphy", while he began to make it known worldwide.

Materials

- Soda can (preferably an elongated model)
- Can opener
- Metal file
- Photographic paper.
- Pin or sewing needle
- Dark cardboard
- American tape (Duck Tape)
- Mobile or Tablet with a red screen application.
- Dark room.
- Scanner
- Computer
- Photographic treatment program like Gimp or Photoshop

Procedure/Method

1. We take a can of previously emptied soda and trim one end with the can opener. Care must be taken not to leave very sharp edges, if necessary it can be filed with a metal file.
2. With a cardboard we make a lid for the can and secure it with American tape (duck tape) so that no light can enter and it is easy to cover and uncover when necessary.
3. Later, we practice a hole as small as possible in the center of the length of the can using a pin or punch. You have to be careful on the inside, it does not stand out, so it can be useful to file it, being careful not to cover or enlarge the hole as it will serve as an objective and the smaller the more defined the solargraphy will be.
4. Using a piece of American tape (duck tape) we cover the hole. The construction of the camera is already finished, now we just need to put the photo paper.
5. For the next step we need a dark room of a photographic laboratory or failing that any room that we have completely in the dark is worth it.
6. Illuminating only with a mobile phone with the red screen, we have to open the can lid and place the photo paper inside, being very careful that the sensitive side is oriented towards the hole.
7. We cover the can again. Now it is ready to be placed.



In this video tutorial in English you can see the manufacturing process in images https://youtu.be/wtZOWEB_wcl

Results

Once the solargraphy is done, it is necessary to remove the photo paper in a dark environment, to prevent the image from spoiling and scan it as soon as possible. Once the image has been scanned, it is necessary to deal with a photo retouching program to positive it (the photograph is negative) and turn it horizontally, that is, that originally the objects on the left will be on the right and live.

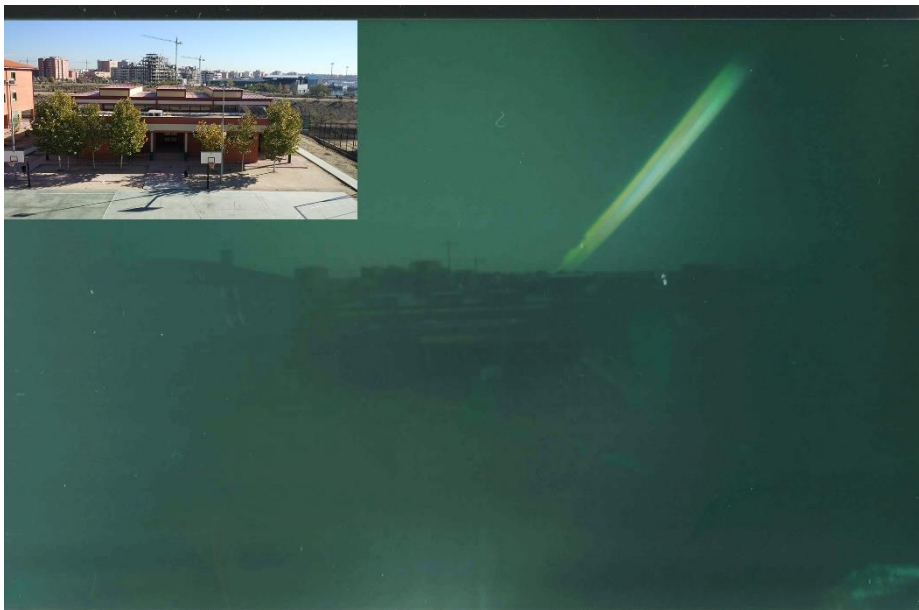
If necessary, the photo retouching program can be used to enhance solargraphy and make it more visible.

Example of raw scanned solargraphy:



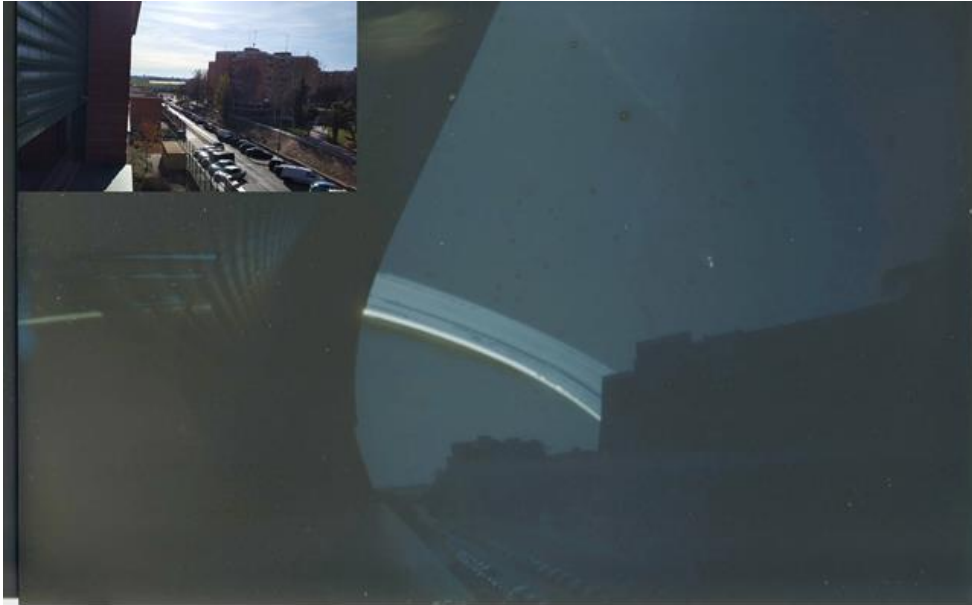
Camera A. East Orientation. Exhibition of one week. November 8, 2017 to November 15, 2017. The grooves left by the sun are visible, the latter being the last one because the sun is falling on the horizon due to the proximity of the winter solstice.

The building facing the camera is the gym of the IES Carpe Diem.



Camera B. West Orientation. Exhibition of one month, from November 9, 2017 to December 8, 2017.

The descending path of the sun is clearly visible in the sky as the winter solstice approaches.



Conclusions

This simple experience, which was also shown at the Science Fair, brings students closer to basic photographic techniques while providing them with knowledge about our star's movements.

Also easy to play at school.

Bibliography

<https://es.wikipedia.org/wiki/Solarigraf%C3%ADa>

<https://fotografodigital.com/articulos/solarigrafia/>

Thanks

We want to thank Paloma Romero and Francisco Castillo, Geography teachers, for this good and interesting idea, that they carried out during the Science Fair, explaining the method to visitors of all ages.

