How to view the sun safely

Noella L. Dcruz
Department of Natural Sciences,
Joliet Junior College, Joliet, IL
ndcruz@jjc.edu

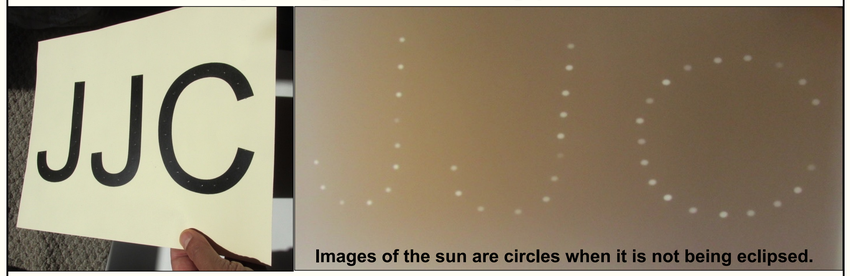
There are three ways to observe the sun safely [1, 2]:

1. View the sun indirectly by projecting its image.
2. View the sun directly using eclipse glasses or eclipse viewers with appropriate solar filters. Reference 2 explains which ones to purchase and how to use them safely.
3. View the sun directly using a telescope with an appropriate solar filter mounted securely in front of the primary mirror or lens.

Caution: Never leave solar viewing equipment unattended.

View the sun directly using eclipse glasses or solar viewers. Reference 2 explains which ones to purchase and how to use them safely. (Credit: Joliet Junior College Media Services)

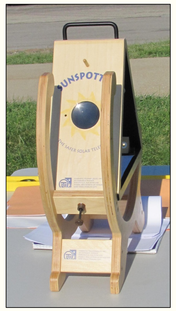
Projecting the sun using pinholes



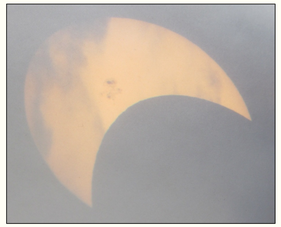
Make pinholes in stiff paper like at left. Or splay your fingers and place the fingers of one hand on top of the other to form a waffle pattern. The gaps between your fingers act as pinholes. Stand so the sun is behind you and let sunlight through the pinholes in the paper or gaps between your fingers. You will see images of the sun projected on the ground. You can project the images on white paper to see them more easily, like those shown on the right. (Credit: N. Dcruz)

Poster presented at the American Astronomical Society's Solar Eclipse Planning Workshop, 8, 9 April 2022, held virtually.

Projecting the sun using a Sunspotter



A Sunspotter, a refracting telescope that projects a 3.25 inch image of the Sun for many people to view simultaneously. (Credit: N. Dcruz)

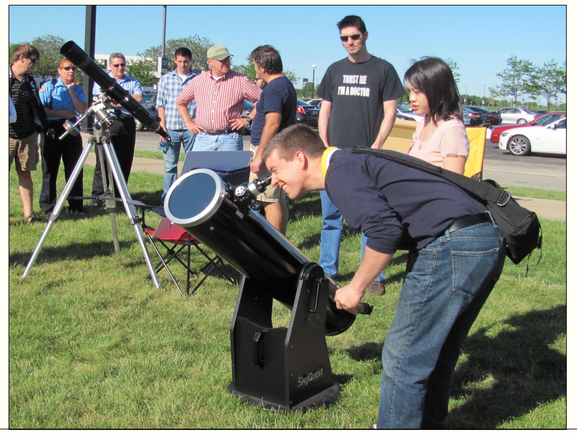


The sun in partial eclipse on October 23, 2014, projected by a Sunspotter. Sunspots and clouds can be seen in this image, taken in Joliet, IL. (Credit: N. Dcruz)

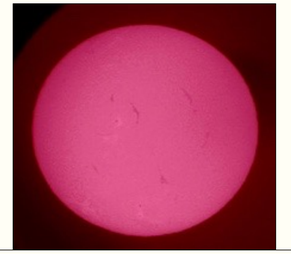
Projecting the sun using a sun funnel

The partially eclipsed sun on August 21, 2017, seen in projection using a sun funnel placed securely in the eyepiece holder of an 8-inch telescope in Joliet, IL. The eyepiece at the narrow end of the funnel projects the sun's image on rear-projection screen placed at the wide end of the funnel [3]. To avoid overheating the eyepiece in the funnel, it is better to place a paper cover with an aperture of about 2-3 inches across the front of a telescope this large when the sky is clear. (Credit: N. Dcruz)

See the sun using a solar filter on a telescope



A member of the public viewing the sun (while Venus transited across it on June 5, 2012), through an 8-inch telescope with a solar filter mounted on its front end, in Joliet, IL. In the background, a refracting telescope was set up to project the sun's image on a large sheet of white paper. (Credit: N. Dcruz)



One can view the sun directly through a Coronado telescope with a permanently mounted H-alpha filter (left), to see the sun's chromosphere, sunspots, prominences, filaments and plages (right). (Credit: N. Dcruz)

References:

1. Observing Solar Eclipses Safely, Littmann, M., Espenak, F., Willcox, K. 2008, http://mreclipse.com/Totality3/TotalityCh11.html Accessed April 2, 2022
2. How to view a solar eclipse safely, American Astronomical Society, 2022, https://eclipse.aas.org/eye-safety Accessed April 2, 2022
3. Fienberg, R. T., Beuter, C., Mayo, L. A. 2016, https://eclipse.aas.org/sites/eclipse.aas.org/files/Build-Sun-Funnel-v3.2.pdf Accessed April 2, 2022