

WHAT'S UP?

Which is more useful, the Moon or the Sun? If asked, answer, “The Moon. The Sun shines during the day when it is already bright, but the Moon shines at night!” Either way they are both interesting solar system objects. Last summer, we took some time and talked about different lunar features to observe at different times during the Moon’s monthly orbit around the Earth (Installments #22 through #25.) Now let’s take some time for the Sun. First, the **BIG CAVEAT AND WARNING!** How can you view the Sun? **VERY CAREFULLY!** You know that looking at the Sun with the unaided eye is a bad idea. Just as viewing a total eclipse of the Sun can harm your eyesight, so can this. Do you have a pair of solar eclipse viewing glasses left from the total eclipse of 2017? If they are not broken or scratched, they will still work. Using a telescope is especially dangerous because a telescope focuses the sunlight into an intense beam on your eyes, can do real harm, possibly blinding you. I do not recommend using a telescope unless you are someone with a lot of experience using telescopes. There are only two **SAFE** ways to view the Sun with a telescope. One is to use a full-aperture solar filter. That is a filter that covers the entire end of the telescope tube. These filters block 99.999% of the Sun’s light. That’s right – they only allow one one-hundred-thousandths of the light through to your eye. The other is called the projection method. In projection, a white screen is placed a short distance away from the telescope’s eyepiece and the image of the Sun is projected onto it. The viewer looks only at the screen. In both methods, the finder scope of the telescope **MUST** be either covered or removed to prevent accidentally viewing the Sun through it. When using the projection method, only a Newtonian or Dobsonian design of telescope



should be used. These telescopes have open ends and allow air to flow through them and keep them from overheating. Closed-ended telescopes will heat up rapidly and damage the optics inside.

Now that we know how to look at the Sun safely, what are we going to see? Hopefully, we’ll be seeing *sunspots*. Sunspots appear as dark blotches on the



Sun’s disc. They are intensified magnetic regions on the visible layer of the Sun. These areas appear darker than the surrounding areas because they are cooler. They are *ONLY* about 6,200 °F (3,400 °C), while the rest of the visible areas are about 9,800 °F (5,400 °C). Why are we talking about viewing these now? Well, the number of sunspots increases and decreases over an 11-year cycle. At present, we are just getting past the last minimum of a cycle and the number of sunspots should be increasing over the next few years. The cycles have been tracked since the mid-1700s, and we are now entering Cycle 25. Cycle 24 was a relatively quiet cycle. Will Cycle 25 continue the trend or surprise us with a lot of activity? The maximum number of sunspots varies from cycle to cycle and is hard to predict. That’s part of the fun of watching. Whether or not you are using a telescope to see sunspots, here is a good website to visit:

<https://soho.nascom.nasa.gov/data/realtime-images.html>. This site shows the latest images from *SOHO*, the *Solar and Heliospheric Observatory*. SOHO looks at the Sun and the region around the Sun using filters that allow different wavelengths of light to pass and be detected. Viewing the Sun at these different wavelengths allow scientists to study different details of the Sun. Here’s a screenshot of what you can see there.



When our closest star has set, giant Jupiter and Saturn are visible in the southeast sky. You can find Jupiter just above and to the left of the waxing gibbous Moon on Friday (the 17th) and just above and to the right of the Moon on Saturday (the 18th). Shining at magnitude -2.8, you can’t miss it (really!). Once you’ve found Jupiter, you can locate Saturn (about 20x dimmer, but still bright at magnitude 0.4) about two fist-widths to the right of Jupiter. They are both among the stars of the constellation *Capricornus*, the *Sea Goat*, to the east (left) of *Sagittarius*, which we talked about last time. That’s it for now!

You can reach me at astroblog@comcast.net with any questions and comments you have. This is What’s Up? installment #51.

Until next time, keep looking up!

Barry