# SeeStar S30 report!

hi all,
Back on November 7th, 2024, after doing a little research, I decided to take a chance and put in an order for the upcoming ZWO SeeStar S30 Smart Telescope. After a three month wait, the little "robot-camera" arrived this past Monday, January 27th. I've spent the past week trying out the telescope's various functions, and I am happy to report that it is a very capable wide-field imaging/EAA telescope! If you can utilize a smart-phone, you will have no trouble with the SeeStar phone app and using this telescope.

This isn't meant to be a "how to use" document, more of just a quick "demo" of the little, but mighty S30.
If you already have an S50, the phone app for the S30 is exactly the same.

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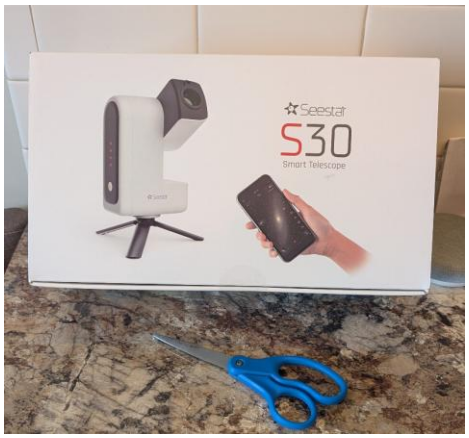
The Telescope arrived from our friends at CCTS (Camera Concepts and Telescope Solutions), well packaged.
After opening and discarding the outer box, here's a photo of the goodies: (note the scissors for size comparison).




Inside the product box was a small padded carry-case containing the telescope, tripod (small but adequate), user guide booklet, USB-C charging cable, and white-light solar filter. Basically the user guide tells you how to download the phone app, either by typing in the html link or using the QR code in the booklet.

Here's the fully assembled S30 (with optional 3rd-party tripod leveler):

(also purchased a 3rd-party dew shield, Bhatinov mask, and lens cover).

Besides the very brief included user guide, you can go to ZWO's website and find a little more detailed version. Here's the telescope "Specs" from the manual:

**1.4 Specification**

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|---|---|
| **Product Model** | Seestar S30 |
| **Sensor** | Tele: Sony IMX662 |
| | Wide: Specific sensor for wide-angle lens |
| **Resolution** | Tele: 1080 x 1920 ,vertical |
| | Wide: 1920 x 1080 ,landscape orientation |
| **Field of View** | Tele: 2.46° |
| | Wide: 23.2° |
| **Aperture** | Tele: 30mm |
| **Focal Ratio** | f/5 |
| **Focal Length** | 150mm |
| **Optical System** | Apochromatic |
| **Builtin Filter** | UV/IR-Cut Filter<br>Duo-Band Filter (OIII 30nm / Hα20nm)<br>Dark Filter |
| **External Filter** | Magnetic adsorption solar filter |
| **Working Distance** | 6m~∞ |
| **Storage Space** | 64GB eMMC included |
| **Transimission Method** | Wi-Fi / USB type-C / Bluetooth |
| **Image Format** | JPEG/FITS |
| **Video Format** | MP4/AVI |
| **Wi-Fi** | 5G/ 2.4G |
| **Wi-Fi Effective Transmission Distance*** | ≤ 10m |
| **Bluetooth Effective** | ≤ 5m |



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|---|---|
| **Transmission Distance*** | |
| **Working Temperature** | -10℃~40℃ |
| **Charging Ambient Temperature** | 0℃~40℃ |
| **Storage Temperature** | -10℃~60℃ |
| **Working Humidity** | 20%~80% |
| **Storage Humidity** | 20%~50% |
| **Mount** | Alt-Azimuth |
| **Slew Rate** | 1X- 1440X |
| **Zero Position** | Mechanical |
| **Battery Life** | 6000mAh, Lasts up to 6 hours after a full charge (tested in ZWO laboratory) |
| **Interface on Base** | 3/8-16 |
| **Weight** | 1.65kg (without tripod) |
| **Power Input** | Type-C, Supports DC 5V~12V, 2A~3A |
| **Wi-Fi Reset Button** | Support |
| **Dimension** | 210mm x 140mm x 80mm |

*Transmission distance: The above transmission distance is based on tests conducted in an open environment with no obstacles between devices.

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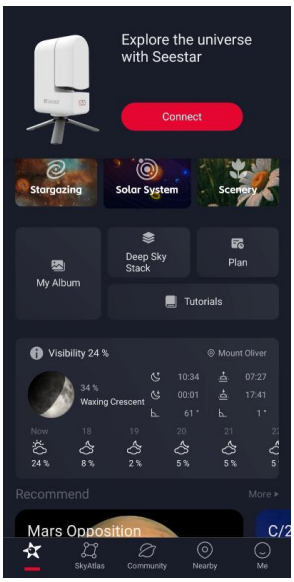
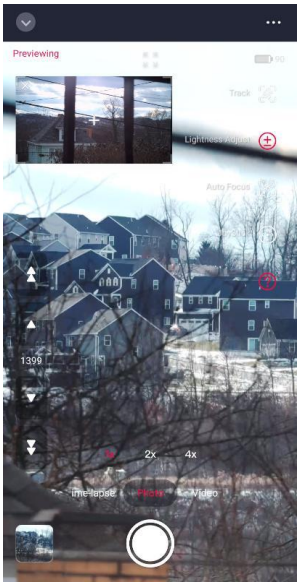
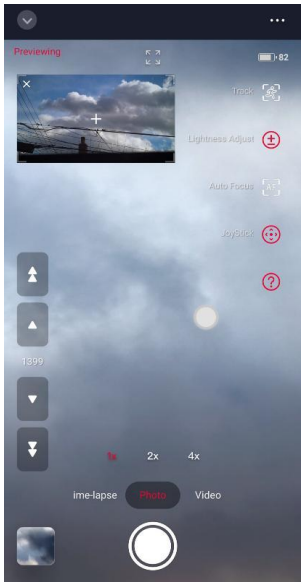
After installing the phone app and watching the tutorials, I experimented with the Daytime Scenery Mode:
The tiny wide lens is useful in pointing the telescope, but unfortunately, you can't image with it.
Scenery Mode is Good for checking out distant structures, clouds, and bird watching!



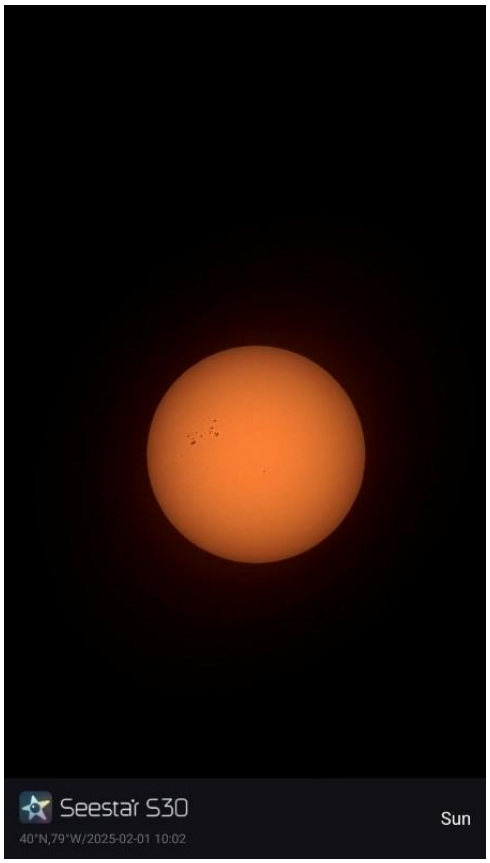





(note: there are a couple of initial scope calibrations that you should perform to help improve pointing accuracy).

I then moved into the Solar System Mode, starting with the Sun. The included solar filter is adequate for use, (make sure to install it before slewing to the Sun!) You can control the exposure (in the milliseconds), and adjust the gain/brightness. The camera offers a 2x and 4x zoom mode: here's the default 1x view and 4x:





This will be a good tool for future solar eclipses.

A few days later I was able to observe the Moon' waxing crescent: (1x, 2x, 4x)




Exposure in the milliseconds, and adjusted the gain/brightness. Again, this will be useful for lunar eclipses and occultation's, along with wide-field imaging of the Lunar Mara and crater rays at Full Moon.

Moving on to the planets, I tried to capture a decent image of both Venus and Jupiter, but wasn't very successful.



For Venus, you can discern it current crescent phase-angle. For Jupiter, there was just a hint of the two major bands, and by cranking up the gain (which over-exposes the planetary disk), you can see the Galilean moons. The telescope's 30mm aperture just doesn't do justice for the two planets. Really need a larger scope.
I didn't bother with trying Saturn or Mars.

So I think for the S30, other than the rare solar eclipse or lunar eclipse, I probably won't get much use out of the Solar System Mode. But, I will certainly try it out on the next bright comet that is visible!

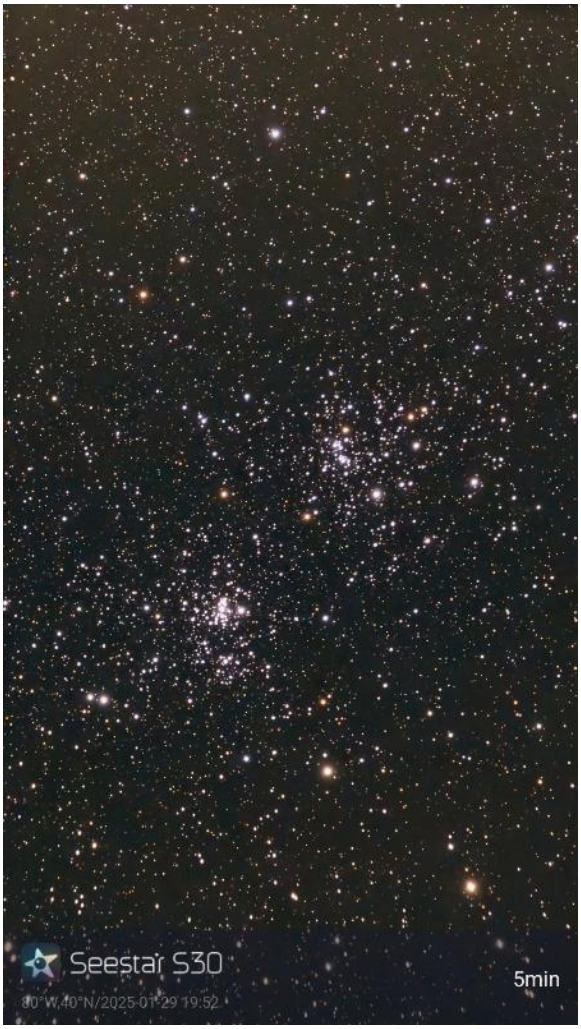
Now, time for what the SeeStar S30 really excels at, wide-field deep-sky EAA/imaging via the "Stargazing" Mode.

There are settings in this mode that you should spend some time learning. I still haven't tried everything there is. You can find/goto objects via built-in lists or by using the built-in planetarium program.
The S30 comes with two internal filters that can be selected: IR and Deep-Sky dual-band filter (OIII 30nm/Ha 20nm). There's also an internal 'dark-filter' that it uses when initially starting an exposure stack.
You can set the exposure for 10 seconds, 20 seconds, or 30 seconds, and stack for as long as you want.
There's also a "framing" mosaic mode that allows you to basically triple the FOV, (and a planning/schedule function that I have yet to try). Once you've slewed to the object and enter in the stacking mode you first see a "live" short-exposure preview of the object. If you're not happy with the initial auto-focus, or want to use a 3rd-party bhatinov mask, you can select the focus tool. Once the stacking has started, you can adjust the image brightness, contrast, and saturation. There's also a nifty "AI De-Noise" tool that helps smooth out a noisy photo.

These are just the main common tools that you will most likely use, but there are other tools/settings that I haven't mentioned that you'll have to check out on your own. Once you are done with stacking your image or EAA observing, just hit the stop button and the final image will be saved both in the onboard SeeStar memory and to your phone's photo file/gallery.

So, let’s get to the deep-sky test images. Other than a little resizing, these will be pretty much ‘as-seen’ with all processing taking place in the SeeStar phone app.

First up, Star Clusters: M41, Double-Cluster. (20 second exposures, IR filter, AI De-noised)
M45 – Pleiades is a 30 second exposure, IR filter, AI De-noised, livestacked for 15 minutes).


Galaxies: M31. (30 second exposures, IR filter, AI De-noised)



In the left-hand image, I chose poorly in centering and cut M110 out of the FOV, lol. Still, the dust lanes look nice. In the right-hand image, I attempted a “framing” mosaic but the session was cut-short by clouds. Still, it gives you an idea of the FOV for what the completed mosaic would have looked. (FOV would have filled the entire photo). When you first setup the mosaic, the app tells you how long it will take. I think this was going to be over an hour.

While I personally didn’t try any other galaxies, I’ve seen decent S30 images of M33, the M81 – M82 duo, and the Leo Triplet. I think the S30 will work nicely on a number of moderate to large galaxies.

Finally, Nebula:
For the nebula, HorseHead (consisting of IC434, B33, & Flame Nebula – NGC2024), M42 (with M43 & Running Man Nebula), and the Helix Nebula (NGC2244 starcluster), I took separate 30 second exposure comparison images/EAA observations using the IR filter (left-hand image) and the Deep-sky filter (right-hand image), and used AI De-noise tool on both. Also made another mosaic attempt with the Helix, but once again clouds ended the session.

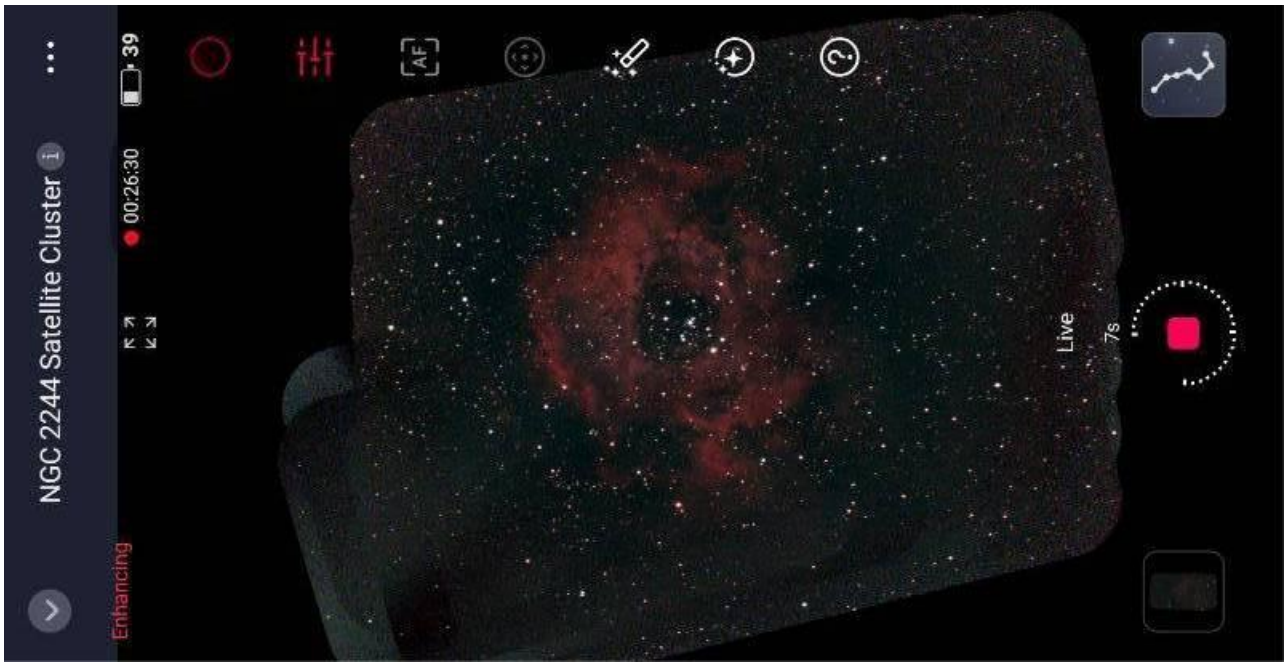
So here’s the test images:

M42 (with M43 & Running Man Nebula):


HorseHead (consisting of IC434, B33, & Flame Nebula – NGC2024):


Helix Nebula (NGC2244 starcluster):





So, what is my overall opinion of the SeeStar S30?

While I already have wide-field equipment that I enjoy utilizing, (EVO50mm refractor, ZWO camera & filters, or my small Canon lens & ZWO camera piggybacked on my C8), setup in my backyard, for an observing session, I still have to dress warmly, walk out to the backyard, uncover the scope, boot-up and connect the laptop to the telescope & cameras, focus and slew/platesolve to an object and then start livestacking.

For the S30, all I have to do is step outside and plop the S30 down and turn it on before heading back inside. (I don't even need to put on a coat! Lol). Then I just start the SeeStar phone app, pick an object, do a quick initialization, and I'm EAA observing/imaging! From the comfort of my living room sofa with a cat on my lap!

The wi-fi connection to the S30 works very well. I was moving about the house up and down floors and the phone was staying connected even thru brick and block walls. The only time I lost connection, (going between floors that involved a steel beam), it was easy to reconnect to the scope, which had continued to image.

I think for most people who are interested in EAA viewing or imaging large-scale deep-sky objects, and do not already have the equipment; the inexpensive S30 is a game-changer! This little smart telescope is more than adequate in allowing the user to observe these objects. This is the greatest benefit of using the S30, being able to easily capture wide-field images of large nebula and galaxies.

So if you don't already have a smart telescope, the S30 is a lot of fun and you can't go wrong using one.

Larry McHenry
http://stellar-journeys.org/