

## Every Picture Costs a Fortune, Don't It?

For most of the last thirty years I have been talking trash to imagers, describing how they are residents of the Dark Side, but still go to bed at sundown, letting the camera do all the work. I reminded them how closely the words imaging and imagining are spoken and spelled and many other vituperous statements that should have gotten me slapped. But now, I've decided to stick a toe into the dangerous waters of astrophotography. This is my attempt to pass along what I've seen so far in the first month, so whether a reader is thinking of doing the same thing or she developed her film pictures in her home darkroom and wants to revisit the perilous journey they can do so at my expense (and there is plenty of expense...)

My experience in imaging consists of using telescope services and observatories with varying levels of user involvement and control. But to progress, I needed to start getting more hands-on. The popular reasons to avoid this were true for me – too expensive, steep learning curve, Hubble will always beat me at whatever images I try, etc.

At Christmas I bought a Seestar S50 to do this experiment and exploration. I've been very impressed with it so far and think it's a great entry level scope for imaging. I'm not going to do a full review; there are plenty of those anyway all over the internet. Equipment aside, what I've noticed is the change in operating approach that has occurred by changing observing technique. With each mode, there are positives and negatives. Let's start with my negative feedback.

Imaging includes a loss of that tactile "I'm here looking at this now" feeling that you get looking through the eyepiece. Of course this is not binary choice, you can still use your visual equipment, but that requires setting up another telescope or hanging appurtenances from your mount. There's always scanning the skies with your eyes or binoculars, nothing wrong with that. And I still think it's important to learn the constellations and how the sky works and you can't do that just sitting troubleshooting your equipment. Loss of immediacy and immersion, gratification some people find to be the best part of amateur astronomy, does occur when imaging.



Another one in the "con" column is that problem solving and troubleshooting. After years of watching people curse at unalive metal tubes and fiddle with wires in the darkest hours of night,

I knew something always seems to go wrong with imaging equipment. Either built into the software / hardware, or if just part of the ether of the universe, there is always a problem, every night every session. This fact is immutable as a fundamental constant like  $\pi$ ; even the Seestar has its glitches. And it just seems to get worse as you get into more complicated equipment. The Seestar is not well built for planetary imaging; it sports a large field of view and low magnification. So, I brought out my Meade ETX 125, a five-inch Maksutov with folded optics and long focal length - great for planetary imaging. So far, the software has recognized the camera once and not again.  $X_{\zeta} =$

## Processing aka Artificial Imagineering

*"What man does; man can fix."* Gilly [a South African under apartheid], [Holidays in Hell](#) by P.J. O'Rourke

Then there's the part of imaging that visual observing has no comparable or equivalent example of workflow: processing. As a process engineer for thirty years, you would think I would look forward to it, but this work is very different. As many readers know, image processing is all about improving the quality of images produced by using techniques such as stacking, removing noise and balancing the color levels and other variables to produce quality output. The imager uses processing software to achieve realistic representation of the subject in balanced tones, aesthetically improved light levels, shadows, and other picture elements.

The Seestar (and others) has an AI algorithm and some other tweaks and bells and whistles installed and takes care of all the calibration images. Exporting stacks of subs as FITS files has yielded spotty improvement so far. Not sure if that means the Seestar native processing software is quite good, or that I don't know what I'm doing, but we know which is the right answer. This early in my experience, it seems you either must commit to pushing for realism or you can choose to allow limited artistic interpretation. And balancing the two is walking a very difficult knife's edge indeed. My preferences will tend towards realism. Most people do like to have some kind of positive feedback for hard work, so they process their images and post them to social media to see what develops [pun intended].

The Four Horsemen of Imaging:



DARKS



FLATS



SUBS



BIAS

It's easy to end this article on a positive note, because there are many objects suited to smart scopes in the evening sky in this, the first month I've had one. I had frankly grown tired of looking at tiny dim galaxies as I finished off the NGCs. And I'm so glad to go instead to bright

items that are large and have detail to them that I can see. Most of my visual observing of late consisted of small objects or clusters of objects that were bright enough to see in my 22" Obsession UC. But there is no way to integrate or stack my vision.

I've always regretted not being able to see nebula very well or to see much color in anything, except maybe the Orion Nebula, a few others, and single stars or components of multiples. Now, I can set up my EAA scope on my front porch in downtown Tulsa, use its light pollution filter and after only a few minutes get a great image of The Orion Nebula or the Horsehead or the Rosette or any of many winter DSOs waiting to be observed in a short time. This is a fantastic addition to my arsenal that I've been waiting to use.

As mentioned above, like any machine it has its issues, starting with user error. Also, the honeymoon can't last forever; everyone works through the easy, bright objects quickly, just as with starting in visual observing. But the Seestar has opened a whole new volume to me (Hands-On Astroimaging) and that's exciting. I needed an infusion of new goals after straining to use my averted vision and other advanced techniques to finish the NGCs.

A big advantage is being able to set your camera outside and go inside to run your plans from your living room off your smartphone. I don't miss the wind and the cold (later the bugs and the humidity). At the Observatory, it's fun to finally be able to have a minute to talk to folks on Visitor's Night and show them on screen what the camera sees while letting the camera run. With the installed Sky Atlas linked, it's easy to select a target and go there in one step, or write a plan for several targets.

One more positive thing and I'll end this month's article. I'm not giving up my 22" Obsession visual telescope - I still plan on using it when the weather is warmer and it's easier to set up and stay outside to get the eyepiece experience that I'm already beginning to miss. And I do like staying dark adapted and being able to see the sky without needing to go outside to do it And pause the TV. But I have to say that not having to deal with the 75-pound mirror and setting up everything all the time including lifting it into the car when I'm taking the telescopes somewhere and having to carry the telescope when I don't really need one for any other purpose is an advantage of the small smart scope. Technology should continue to improve, resulting in smaller, cheaper, and smarter imaging systems that will negate some of the weight and space limitations current with air travel etc. The market will drive improvements to ease the frustrations and system inconsistencies, as impactful technology like EAA Scopes is going to improve amateur astronomy, and that's a good thing.

I know many of you have already been through all this and probably find it a bit amusing to hear such a newbie ramble on. But I'm glad to say that after forty-six years of thoroughly enjoying visual astronomy, I now feel like adding simple imaging projects to my routine has given me more chances to observe, more objects to observe, and new things to learn to keep my hobby fresh and exciting. And after all, isn't being excited about your hobby something that helps you stay with it? Or, if you are new to the hobby, can expand what you learn to do to move from the newbie phase straight to affordable, accessible targets and methods to try.