

Photonic Cleaning Technologies presents; Michael Mangieri Astrophotography from Light Polluted Reisterstown



The Seagull (IC2177) William Optics GT102 / ZWO ASI1600mm / SHO narrowband / 25h25m Integration time
Astrodon Ha 5nm: 101×300"
Astrodon Oiii 3nm: 101×300"
Astrodon Sii 5nm: 103×300"

I have been an amateur astronomer since my early days in grade school way back in the 1960's. I would spend hours in my room reading all the books and journals I could get from the local library. Photocopying the information would be expensive and require long periods of time in the library so my dad bought me a typewriter which I used to hand type the information in order to have it whenever I needed it (I still have some of those typewritten notes). On Christmas day, 1964, my parents presented me with a 2.4" refractor (I forget the manufacturer) on a simple Alt-Az tripod. Immediately I went outside in the frigid New York air that night at my uncle's house and spotted a bright star. I focused the best I could, but the star remained a disk.

At first, I thought, a supernova! Then I observed four dimmer and more starlike images all in a line on one side of the object. It was then I realized it was the planet Jupiter, and those stars were the four Jovian moons. I was amazed, and from that day on I was totally hooked on astronomy.

In 1966 my family moved from New York to Baltimore. As I started High School my desire for a larger telescope was growing more and more. I really wanted to photograph those wonderful objects in the sky. I researched what I would need and ended up with a Criterion RV-6 Newtonian reflector which we actually picked up at the manufacturing site in Connecticut on the



The Rosette – William Optics GT102 / ZWO ASI1600mm / SHO narrowband



M16 (Pillars of Creation) – Celestron EdgeHD 11" / ZWO ASI1600mm / SHO Narrowband



Andromeda Galaxy (M31) – William Optics ZS61 / ZWO ASI2600mm / LRGB

way home from our summer vacation on Cape Cod. I built a permanent pier in my backyard and spent hours viewing the night sky. But I really wanted to take photos, and astrophotography turned out to be a real challenge. There were no digital cameras back then and film was the only photographic medium available. I knew I needed some very sensitive film and so I set up my own darkroom, learned how to develop hypersensitized Tri-X and started down a road that would only lead to frustration and failure. But I kept trying – focusing was a challenge; hand tracking the scope with only a RA clock drive was a challenge; dealing with the cold temperatures was a challenge. One evening, my focuser froze in place as my breath was freezing on the draw tube. The results were typically some blurry streaks on an otherwise black field. At that point I decided to forgo astrophotography until technology made it feasible to deal with. I upgraded my telescope to a Criterion Dynascope 8" SCT which I used for visual observing and photographing the moon.

In the late 70's through the 90's work and graduate school occupied much of my time and astronomy took a back seat. Although I was accepted to University of Maryland back in 1977 to pursue a PhD in Astrophysics, I decided to move into Software Engineering instead where the likelihood of a decent salary for a recent newlywed would be greater. I was also composing new age synthesizer music, completing a CD in 1995, updated in 2000 and then another in 2010. In 2000 I became very involved with amateur high power rocketry (another love of mine), designing and launching various rockets in association with MDRA, the premier independent rocketry association in Maryland. Then, in 2013, with all the talk of Comet ISON, I got back into astronomy with a passion. I purchased a Celestron EdgeHD 1100 and started with digital astrophotography. I never did capture comet ISON, as it fizzled out before I could get it, but the road toward astrophotography was ahead of me, and I was taking it full throttle.



Soul Nebula (IC 1848) - William Optics GT102 / ZWO ASI2600mm / SHO narrowband + RGB Stars



Coathanger (Asterism) - William Optics GT102 / ZWO ASI2600mm / LRGB



Needle Galaxy (NGC 4565) - Celestron EdgeHD 11" / ZWO ASI533mc

I now operate a small observatory in Reisterstown, Maryland. The actual building is still in the planning stages (plans are to have this as an addition to my house), but the mount, an Astro-Physics AP1100, is on a pier covered with a Telegizmo 365 cover. In the Spring of 2022 I had to reconstruct the pads I used to hold the tri-leg pier to rectify a problem I had with a slow, but steady drift of my polar alignment, especially in Declination. Examination of the ground showed what I feared might be the case - moles decided to dig under and around the area. This is a systemic problem that plagues the 2+ acres of grassy land of my property that still needs to be addressed, but that's another story. The new pads are each constructed of three 12"x12"x1.5" paver stones, cemented together with a paver base 12" deep. So far, it is working very well and polar alignment only needs to be readjusted once every month or two.

All my images are taken through the light polluted sky of my backyard using one of three telescopes and thanks to the wonder of narrowband imaging, I can do fairly well under these conditions.

Whether taking subs through my large Celestron EdgeHD-11 to get up close and personal, or with the William Optics 102mm and ZS61mm to get that wide angle view, I am able to capture the exquisite colors and details brought out via narrow band filters to cut through the light pollution and target the specific wavelengths of light that's being emanated by these deep sky objects. And all of this got even easier with the new improved camera technology that finally arrived! Specifically backlit CMOS sensors, which boast high resolution, really deep-well depth, and zero-amp glow (yeah).

My standard setup is either the GT102 or the EdgeHD11 paired with a ZWO ASI2600mm camera, newly acquired Optolong NB filters (Ha, Oiii and Sii, all 3nm), a 7-position 2" ZWO filter wheel, and Feather Touch and ZWO focusers.

I run everything via sequences set up in Nighttime Imaging 'N' Astronomy (N.I.N.A.) for image acquisition, and PixInsight for image processing. Each night I drag out the scope(s), power supplies and unit containing my Next Unit of Computing (NUC) computer, focus controller and power distribution unit. It only takes about 15 minutes to get everything mounted and powered up. Then I'm ready to remotely operate my scopes from the comfort of my outbuilding.

Both 2019 and 2020 have taught me that NUCs work really well as pier-side computers for running your telescope equipment. But it also taught me that, like in all other areas of technology, astro gear improves over time. My initial Minisforum GN34 NUC has served me well over the past years, but there were plenty of nights when the unit's speed and capacity were strained with what I was trying to push through it. So I replaced it with a new BeeLink U57. This unit boasts a 5th Generation Intel Core i5 processor, 8GB of memory, a 256GB SSD and of course, plenty of USB3 ports, WiFi, Bluetooth and Ethernet 1000 Mbps LAN, all in a box 124mm x 113mm x 41mm; it comes with Windows 10 Pro, so remote logins are easy.

I'm still learning (never ends by the way), as the field of astrophotography is quite complex and there is always something new to discover and work on. Although I dabble in planetary photography with my Edge every now and then, I most enjoy capturing nebulae and comets. However, eclipses, both solar and lunar, are always in my planning. In 2017 my wife and I took a vacation trip to Salem, SC, and I finally got to see my first total eclipse of the sun, and WOW ... it was fantastic! Words can't describe the images of the sun blacked out and the diamond ring was simply awesome - photos don't do it justice.



Heart Nebula (IC 1805) – William Optics GT102 / ZWO ASI1600mm / SHO narrowband + RGB Stars



Total Solar Eclipse, August 21, 2017 – Salem, SC



Solar Eclipse Prominences



Full Moon



Ptolemaeus, Alphonsus, and Arzachel



Scope & Mount

Even though I was a member of the “Eclipse Megamovie Project” (joint project by the Space Sciences Laboratory at the University of California, Berkeley, and Google), I had never imaged a total eclipse before, and was learning as I went. My attempt at the Bailey’s Beads and the diamond ring didn’t turn out as well. I was so intent and thrilled with watching the onset of the total phase with my eyes that I forgot to remove the solar filter from the telescope. Oh well, there’s always 2024!

There is one other challenge that I needed to tackle and that’s the high humidity during the summer months coupled with the fact that I live on 9 acres of woods with lots of pollen and dust. After months of use the optics on my scopes get quite dirty as the dew and pollen form a film over the objective lens of my GT102 and the corrector plate on the Edge. I tried the water and alcohol method, but it is a time-consuming task and I really fear that I might press down too hard and scratch the lens. I researched a way to approach cleaning differently and came across First Contact Polymer from Photonic Cleaning Technologies. After reading the information on their website and getting some reviews from other folks I decided to give First Contact a try. I was pleasantly surprised at the results after trying it out on my GT102 optics and although I haven’t done it yet, I plan to clean my filters and eyepieces as well. This will be a yearly process as part of my maintenance plan.

Check out my websites at:

<https://skyandrocks.blogspot.com>,
[https://www.astrobin.com/users/XCalRocket Man/](https://www.astrobin.com/users/XCalRocketMan/), and The Astrophotography of Michael J. Mangieri at <https://mdastro.com>.

Are you a First Contact Polymer user and Astro Imager? Contact us at sales@photoniccleaning.com for the chance to be selected as a featured guest in an upcoming issue of Amateur Astrophotography Magazine courtesy of Photonic Cleaning Technologies! Not familiar with our products? See our ad on the next page or visit us at <http://www.photoniccleaning.com>