Deep Sky One-Shot Color Astro Image Processing Using Pixinsight, PhotoFiltre, & Topaz Sharpen AI Software

By Bill Wood, Little Colorado River Valley Astronomy Club

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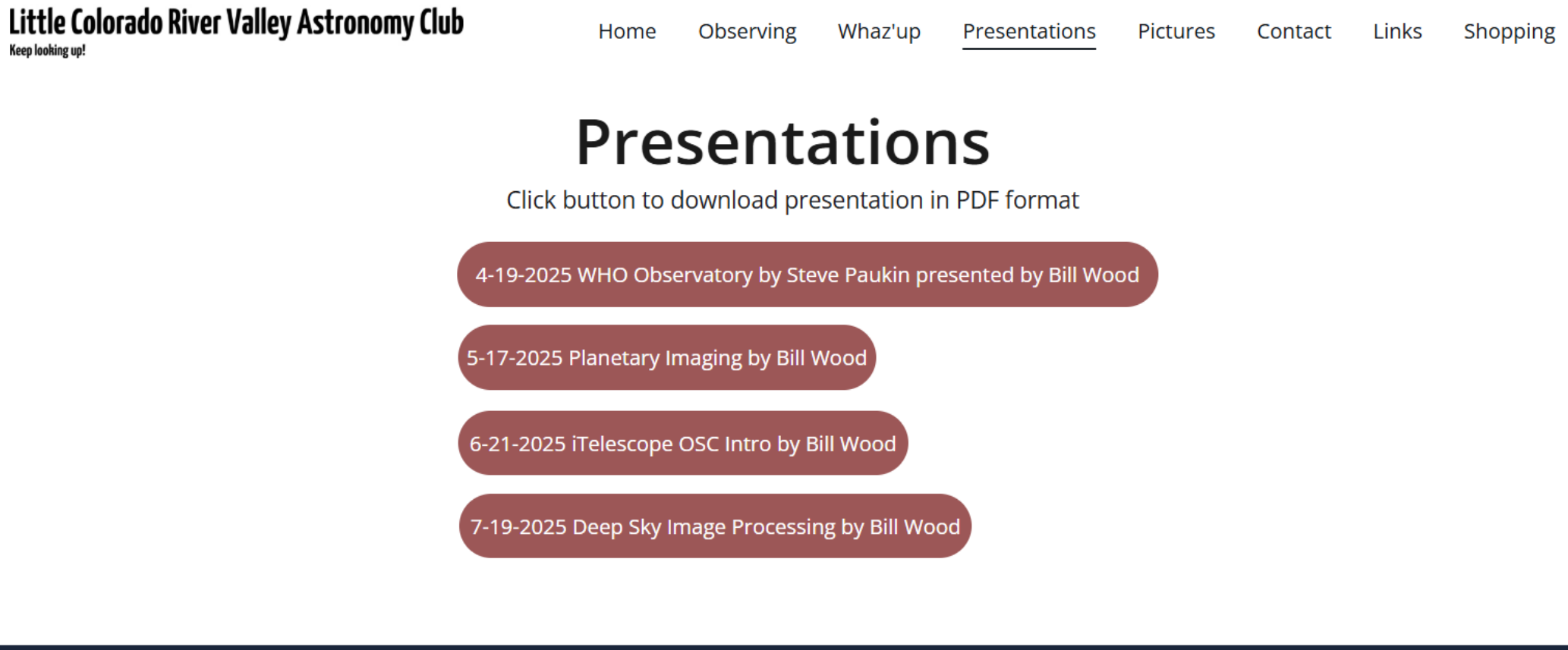

Deep Sky Imaging

-Objects are very, very faint.
-Typically requires multiple timed exposures of 10 seconds to 300 seconds each.
-Stars must be tracked during longer time exposures.
-Majority of image data is black.
-Image sensor data is called linear or raw data.
-Images also contain hot & cold pixel defects and electronic noise.

PixInsight

Deep Sky Imaging Sensors

-CCD and CMOS image sensors.
-Monochrome & color cameras.
-A color image sensor dedicates 4 pixels to make a single-color point on a picture.
- Each pixel has a red, green, or blue filter over it.

PixInsight

Color Camera Bayer Pattern - RGGB

- 2X2 CFA, Color Filter Array (Left to Right, Top to Bottom)
- Each 2X2 CFA is blended to generate one color pixel in the resulting picture

R	G	R	G
G	B	G	B
R	G	R	G
G	B	G	B

PixInsight

- Capture image data with iTelescope T68. See June presentation-How to use iTelescope.net. iTelescope's images can include pre-calibrated images (darks, flats, & bias).
- Purchase image data from insightobservatory.com or telescope.live.
- Take your own star shots with a stationary DSLR camera.
- I use a Player One Uranus-C camera for both Planetary & Deep Sky imaging controlled by SharpCap Pro software thru my telescopes on an Orion Sky View Pro tracker.

PixInsight

- Pixinsight software by Pleiades Astrophoto is based in Spain and is a free trial for 45 days then ~$350 for a perpetual commercial license.
- Pixinsight supports Star Alignment of multiple frames, Integration (merge) of multiple frames into a single frame, calibration of the colors, stretching the histogram, & reducing the noise.
- Pixinsight has hundreds of processes to enhance astro photos.
- Pixinsight has many examples on YouTube & across the internet.
- Workflows are available to guide you thru using which processes and in what order.
- Many other software packages are available for similar astro image processing. This is the one I've used for over 9 years.

PixInsight

- Demo PixInsight, PhotoFiltre, & Topaz Sharpen AI processing workflow using M101 images from a ZWO SeeStar s50 automated telescope.

Basic Pixinsight Workflow

StarAlignment

ImageIntegration

Weighted Batch Pre-Processing (Includes Calibrations, if selected)

ScreenTransferFunction

SpectroPhotometricColorCalibration

DynamicCrop

BlurXTerminator

NoiseXTerminator

HistogramTransformation

SCNR

CurvesTransformation

Save as XSIF & 16bit TIFF

Linear

Stretched

PIXINSIGHT

Image Editor; Gamma, Contrast, Saturation, Blur, Crop, & Text

Save as JPEG, < 10M, & Share

PhotoFiltre & Topaz Sharpen AI

August 16, 2025 Presentation

ZWO SeeStar S50 Automated Telescope

By Bill Wood, Little Colorado River Valley Astronomy Club

Winslow Homolovi Observatory Observing Session

- M57, Ring Nebula (Planetary Nebula-Low Stellar Mass Nova), 1,400 Light Years Distance
- M92, Globular Cluster, 150,000 stars, 26,000 Light Years Distance, Brighter than M13
- Albireo, Double Star, 380 Light Years Distance, Colorful Indigo & Gold colored stars, side-by-side
- M27, Dumbbell Nebula (Planetary Nebula-Low Stellar Mass Nova), 1,700 Light Years Distance
- T Coronae Borealis, Blaze Star (Recurrent Nova), 2,700 Light Years Distance, Outburst Pending

Winslow Homolovi Observatory Observing Session

- Dress warm. Nighttime can get chilly with a light breeze.
- White lights can be used around the visitor center & parking lot. Avoid pointing a white light including car headlights at the observatory.
- Red lights only adjacent and inside the observatory. This protects your dark adaptation and gives you a much better eyepiece view.
- Please take your time at the eyepiece. The human eye does not work well in the dark. Use averted vision & be patient.
- If you have any questions please share. We have quite a few friendly volunteers with a breadth of knowledge and experience.
- We're debugging an issue with our new wireless control of the telescope so please put your cell phone in airplane mode. Thank you.