

Offered Title: Astrophotography 6 – Big Guns

Correction: While reviewing my last article I realized I made a mistake regarding how aperture (focal ratio in my example) affects exposure time. The correct relationship is: An f 4 ratio optic requires only half the exposure time as f 5.6 (not f 8). At f 8 the exposure time quadrupled!

Going beyond a camera/lens setup on a tripod, we get into the realm of telescopes, big guns. Which telescopes are good for astrophotography? Any good telescope can be used with fine results, but here are the better ones.

Refractor: Easy to set up and able to provide excellent images, however they tend to have what is termed “field curvature”, a condition that causes stretched out stars at the field edges. This is correctable with an accessory “field flattener” and there are refractors with built in field flatteners. The ideal refractor might be around 5-7” diameter, with a focal ratio of 6 (f 6) or less. The best ones are apochromatic (APO), where critical wavelengths of light (red, blue, green, yellow, violet) are coaxed together by special and expensive types of glass lenses in the objective. APO refractors produce a spectacularly clean image. Cost: \$4,000-15,000+

Ritchey-Chrétien (R-C): Think Hubble, Keck, and other modern large telescopes. This modified Cassegrain design was made for astrophotography, with a wide flat field, little in the way of distortion, and more bang for the buck than refractors of equal quality. You can get much bigger, in the 14-18” diameter range, and pay about the same as a top notch 5-7” refractor. Smaller R-C scopes, in the 6-12” range are a very good value. There is a downside however, as R-C scopes are not good for visual observing. They have poor contrast so things look washed out visually. This is corrected when processing images with software. Cost: \$700-15,000+

Dall-Kirkham: Another modified Cassegrain design, the Dall-Kirkham was originally best for planetary and high-power imaging. Additional modifications and corrective optics have transformed it into a powerhouse wide field imaging optic. Current D-K designs also allow for excellent visual astronomy. It can rival and even beat the R-C, but at a cost. The best wide field D-K scopes can cost significantly more than the same size R-C. Cost: \$3,000-15,000+

Rowe-Ackerman Schmidt Astrograph: This take on the Schmidt camera design adds a corrector lens group just before the camera attachment. This correction allows for a very fast (f 2.2) and well corrected optic. They can produce excellent images. The downside is that the camera attaches directly to the front, so the focal point is in line with the object of interest. This means it is not meant for visual use.

What’s in the Sky?

Our two giant planets, Jupiter and Saturn are ruling the night. Rising after dusk, Saturn reaches opposition on June 14-15 and will be at its closest to us for a year. Saturn’s rings, tilted at 26.5 degrees, makes for a beautiful view.