DEEP-SKY OBSERVING

What we saw through a 30-inch telescope under an inky black sky blew our minds. /// BY MICHAEL E. BAKICH

Observing the way it was meant to be

Nothing is better than observing under a dark, clear, steady sky. Wait, one thing’s better — observing that sky through a large scope. In February, I had the opportunity to do just that under the pristine conditions at Arizona Sky Village (ASV), located in Portal, Arizona. As a guest of real-estate developer Eugene Turner, I had 2 nights with Turner’s superb 30-inch Starmaster telescope.

The 30-inch is a high-quality Newtonian reflector on a Dobsonian mount. I’d used this telescope one year earlier, with Astronomy’s editor, David J. Eicher. We observed many celestial wonders in Orion and the rest of the winter sky. One of us would call out an object, and Turner would direct the telescope toward it.

The bigger, the better

Aperture, the size of a telescope’s main lens or mirror, offers two advantages: light-gathering power and resolution.

The more light a telescope gathers, the brighter the image will appear and the more detail you’ll see. If you double the aperture, you capture 4 times as much light. So, an 8-inch telescope gathers 4 times as much light as a 4-inch.

But there’s another advantage to all the light a large scope collects. The object may appear bright enough to trigger your eyes’ color receptors. A planetary nebula that looks whitish-gray through a 6-inch telescope may show shades of aqua or blue through a 12-inch instrument.

The other factor influenced by increasing aperture is resolution, the ability to see fine detail. In the simplest formula that defines a telescope’s resolution, called Dawes’ limit, the resolution (in arcseconds) equals 4.56 divided by the telescope’s aperture in inches. So a 4-inch scope has a resolution of 1.14” and an 8-inch scope’s resolution is 0.57”. The quality of Earth’s turbulent atmosphere over a particular site determines a telescope’s true resolution, but a large scope starts with a bigger advantage.

The man with a plan

Not wanting to waste a moment of such high-quality observing time, I prepared an observing list of 30 objects. During the 2-night adventure, I observed every one of my targets, plus many more.

Because it was February, sky objects naturally divided into two classes. In the early evening, the winter Milky Way with its nebulae and bright star clusters dominated the view. After midnight, the region 19th-century observers called the “realm of the nebulae” rose into view.

Astronomers now know these “nebulae” are galaxies. Traditionally, the three...
stars of the Spring Triangle asterism — Arcturus (Alpha [α] Bootis), Spica (Alpha Virginis), and Denebola (Beta [β] Leonis) — mark the realm’s boundaries.

Galaxies are the toughest class of celestial objects to observe. Most of them are faint and large. While planets and planetary nebulae occupy only arcseconds of sky, galaxies stretch for arcminutes. Galaxies’ sites give most of them low surface brightnesses. To see detail in them, you must use at least an 8-inch telescope.

Low surface brightness means you must avoid light pollution. For galaxy-watching, you must use at least an 8-inch telescope.

Hello, old friends

Although I was understandably eager to begin, it wasn’t anticipation that led me out during evening twilight — it was practicality. For in the south-southeastern sky sat one of amateur astronomy’s all-time observing challenges: Sirius B.

This white-dwarf star shines 10,000 times fainter than Sirius and currently lies only 8” from its brilliant companion. Observing this pair during twilight cuts a dozen ASV residents and visitors) saw it a couple of hours later when Sirius sat high — it was practically invisible. Spotting it requires high power, a steady sky, and a high-quality telescope.

Sirius B currently lies 8” from its much brighter companion, the largest separation in many years. Spotting it requires high power, a steady sky, and a high-quality telescope. Although I was understandably eager to begin, it wasn’t anticipation that led me out during evening twilight — it was practicality. For in the south-southeastern sky sat one of amateur astronomy’s all-time observing challenges: Sirius B.

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