

GALAXIES BY MOONLIGHT

A decade ago I chased down Stephan's Quintet in a 90 mm refractor. I detected what was probably the lens of one galaxy, via averted vision, prolonged staring, jacket pulled over the head, and other tricks. I tried several magnifications: The best was about 90x -- 1 mm exit pupil -- much more magnification (for the aperture) than most people use for fuzzies. It was a lot of fun, and my report started a great controversy on sci.astro.amateur, until someone duplicated the observation.

Sometimes the simplest things are the least obvious. I didn't think till last week, that at 1 mm exit pupil, a lot of light pollution, from city lights or the Moon, is spread out to invisibility. I observed Stefan's Quintet in dark sky, but success implied dark sky was not necessary: It ought to be possible to observe galaxies, to the limit permitted by aperture, in brighter conditions.

On 13 May, 1997, members of the San Francisco Bay area Internet astronomy club, "The Astronomy Connection", held a close-in quarter-Moon star party at Montebello Open Space Area, near the crest of the San Francisco Peninsula hills, a mile or two toward Palo Alto from the intersection of state highway 35 and Page Mill Road. By twilight's end, afternoon cirrus had mostly cleared to transparent sky, and the seeing was improving. Yet with a six-day Moon high above, and the sprawl of a vast suburban area five miles away, the site was certainly not dark.

I had my Intes 6-inch f/10 Maksutov, whose well-corrected, wide, flat field, good internal baffling, and two-inch focuser make it an excellent deep-sky telescope. The recent experience of a friend provided a handy observing program: Mark Wagner had spent the preceding Friday evening at Fremont Peak State Park, near San Juan Bautista, California, with his 14.5-inch Newtonian, and had made a sweep through southern Coma Berenices in dark conditions. I had cross-checked his posted observations with my own log, and listed ten galaxies he observed, that I had never seen. They spanned published magnitudes from 11 through 15 -- a challenging range for a six-inch instrument.

(I hope no one thinks it a putdown that I tackle with a six inches what Mark used 14.5 inches to survey: He has been doing the Herschel list, and a 14.5-inch telescope is mostly loafing with that stuff. Where a 14.5-inch sees detail with ease, a 6-inch may seek detection with effort, and I was determined to make an effort. And I must also point out that published galaxy magnitudes are notoriously unreliable.)

I pointed the telescope near M100, and began. I star hopped with 47x (32 mm Plossl, one degree field) and observed with 150x (10 mm Vixen

Lanthanum, 20 arc minute field). I took care to dark-adapt -- the Moon was a problem, so I kept my observing eye closed or covered when possible, and used eyepiece cup and hand to shield it at the telescope.

How handy is a driven mount with good slow motions! Star hopping is easier when you know which way is which, and the drive facilitates stopping to check charts, or to show things to others. At 150x, not too far from the celestial equator, a centered object is out of an undriven field in less than a minute.

The first galaxy was NGC 4396, handily near a star. Averted vision and staring finally revealed it. Then came NGC 4421, brightest on my list, which Burnham somehow left out of the *Celestial Handbook* -- it is nearly 11th magnitude. NGC 4489 and 4502 were tougher. I could not find NGC 4523. Then I found the faint pair, NGC 4633 and 4634, and my observations in that area were curtailed by passing cirrus.

Three other observers were present. I had offered them looks at several of these galaxies. Not everyone could see them all, not even bright NGC 4421, but one observer could see NGC 4633 and 4634. The other folks were probably not as well dark-adapted as I was.

I also looked at NGC 4565 -- a favorite. It stood magnification well, showing a star-like nucleus amid the central bulge, peeping out over the dark lane, flanked by the long streak of the nearly edge-on disc. I was pleased also to find several much fainter nearby galaxies, notably NGC 4555, and those marked on *Uranometria* as NGC 4565 A, B, and C. The first of these is also labeled NGC 4562; the other two may be IC 3646 and IC 3643, respectively.

According to *NGC_2000.0*, magnitudes of these galaxies range from 9.6 (NGC 4565) and 11.6 (NGC 4421), to 15 (NGC 4502), with several at interim magnitudes. The fainter magnitudes in that reference are all photographic. Galaxies are often much brighter visually, and as I said, galactic magnitudes are notoriously unreliable anyway.

I was pleased how well the Intes performed in bright sky. I might not have believed it possible, but as Yoda says, "That is why you fail." I will do more of this kind of work, and report.