

# Imaging Nine Floors Up

*You might be surprised at all the advantages over a dark-sky site.*

**THE NIGHT SKY IS NOW CLEAR** and dark. With a limiting magnitude of 3.5, it's a good night. I set up the telescope for some deep-sky imaging.

My site is not ideal. I'm imaging from my 9th-floor, northwest-facing balcony in heavy light pollution amidst Toronto's population of five million. Having no convenient access to a dark sky, I work with what I have. Other amateurs who live in cities might not even try urban astronomy, figuring what's the point.

I used to observe in the usual way, eyeball to eyepiece, using my 20-cm Schmidt-Cass Go To telescope. Finding targets in a washed-out sky proved difficult, but I didn't give up. I wanted more. So I set the eyepieces aside and invested in an astronomical camera and a laptop. I then learned the best targets to image with my equipment and light-polluted skies without using filters. It changed everything.

Monochrome CCD/CMOS sensors are about three times faster than

color cameras. They also have a wide spectral response that includes stellar wavelengths not produced by artificial lighting. Taking multiple exposures of 1 to 10 seconds each, totaling 10 to 20 minutes, reduces any tracking issues. Software then removes field rotation and sky brightness while at the same time enhancing my targets.

I can now image faint magnitudes. The telescope's limiting magnitude went from 12.5 visually to 15.5 on the live-image laptop and, after processing, to 18 with the full Moon and greater than 19 when moonless. My observing sessions are now longer, and they go much deeper into space. I've gained 7 magnitudes by switching to mono-imaging and lose just 1.3 magnitudes compared to a dark-sky site.

I have discovered many advantages of a balcony over a distant dark-sky location. Travel time from home to observing site is only seconds, and my set-up time is under 15 minutes. Nine floors up means no dew or mosquitoes, ever. I can "observe" from my living room, and, barring a blackout, I'll never run out of power. Maintaining dark adaptation is unnecessary, and I can easily see my way around the balcony site. Forgetting to bring critical items to a distant viewing site can be a big deal. With the balcony, I simply step inside to retrieve them.

A balcony also has full site security. No strangers, curiosity seekers, animals, property owners, or police with flashlights will ever show up. The balcony's concrete floor is flat, hard,

and rigid. Equipment theft is not an issue, so my suitably protected telescope and equipment can stay on the balcony year-round.

Lastly, observing from a dark-sky site can involve costs for gas, vacation time, even hotels and restaurants. A balcony site's cost is effectively zero every time. I also know when it's clear for each balcony observing session. This contrasts with a distant dark-sky site, which might have clouded over by the time you reach it, or, worse, remains cloudy throughout your expensive cottage rental period. Ouch!

They say the best telescope to buy is the one you'll actually use. Well, the same is true for observing sites! This city astronomer can now smile.

■ **KEN PILON**, an urban astronomer for more than half a century, is a former editor of 'Scope, the newsletter of the Royal Astronomical Society of Canada's Toronto Center.



VALLEYBO163 / SHUTTERSTOCK.COM