

deeper to the 17th magnitude requires 30-inch aperture... like Mike Wirth's StarMaster).

M31 is often considered disappointing, but when viewed with 24-inch aperture in a black sky, it is indeed a true spectacle. Even the outer spiral arms and the dust lanes jumped right out, revealing great detail. Just how good was the sky quality?... well, M33 Triangulum Galaxy was visible with unaided eyes!

Ken bagged 2 Comets (177P Barnard, and 4P Faye). On the RASC Challenge List, Ken easily observed a globular cluster reputed to be so faint that it had required the 200-inch Palomar scope in California to discover it (this globular is now named Palomar 11). Also, Maffei I Galaxy, which was not even discovered until 1968, is claimed to be almost invisible through galactic dust... but it was easily seen with just a 12.5-inch Dob! And the supposedly challenging galaxy IC342 was so EASY that even its face-on spiral arms stood out... just like in the photo of Oct 2006 "Sky News". With Arden's superb skies, who needs those cumbersome CCD cameras? :)

With an O-III Nebula Filter, the 12.5-inch scope gave superb views of Swan Nebula, NGC 6888 Crescent Nebula, M42 Orion Nebula, Veil Nebula plus Pickering's Triangular Wisp. Besides the common planets, we saw Pluto, now called a "dwarf" ...and yes, it appears as such. Uranus and Neptune were observed, and both studied with the 24-inch scope for moonlets (found one... Titania).

Perhaps the night's best view was of NOTHING ...the large Dark Nebula named "Barnard 361" - composed of molecular gas and cold dust that is unfathomly black even against its dazzling star field in Cygnus. Dark nebulae can only be enjoyed from unpolluted skies like those of that Arden. For this reason, you don't hear much about B361, but it is very easy to find close to North American Nebula (Hudson's Bay and Gulf of Mexico were naked-eye), and B361 is located right next to NGC 7026 the "Cheeseburger Nebula"

We were all comfortably dressed for the night. Air temperature by dawn had dropped to +4°C, but right at ground level, some surfaces that radiate faster had FROST on them... and yes, it was AUGUST. With superb transparency, the approach of dawn made the

zodiacal light clearly visible. Not stopping until well after first light, we finally ended and packed up to head home at 5:30am, just in time for Doug to leave on his family-trip to Ottawa's National Art Gallery. He later confessed that he was "dragging a little" through the gallery after a remarkable night of observing. Astronomy can be like that - no pain, no gain! But on a night like this... "oh, how sweet it is!"



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The Sky Quality Meter and its Travels

Kevin Kell & Kim Hay

at the Starlight Cascade Observatory just outside Yarker Ontario

SQM Reading Summary:

Starlight Cascade Observatory Yarker ON

200609 SQM=21.11

Fall'N'Stars Thomasburg ON

200509 SQM=21.13

NYAA Oak Heights, Colborne ON
 Cypress Hills Park, Saskatchewan
 Sleaford Observatory Saskatoon Centre
 Glenlea Observatory, Winnipeg Centre

200507 SQM=20.23
 200608 SQM=21.46
 200608 SQM=21.45
 200608 SQM=20.58



What is it?

The Sky Quality Meter measures the brightness of the night sky in "magnitudes per square arcsecond". At a price of under \$150US, it is the first measuring device available to amateur astronomers to give you actual quantitative data about the sky quality.

Data subset #1

At a summer 2005 NYAA StarBQ Observing Session north of Colborne, we tested our unit aside two others and got readings within 0.06 units of each other. This gave us good confidence in the meters' consistency.

Date	Time	Meter1	Meter2	Meter3	Average	Standard Deviation
20050702	21:50 EDT	14.51	14.58	14.50	14.53	0.04
20050702	21:50 EDT	14.59	14.72	14.58	14.63	0.06
20050702	21:50 EDT	14.64	14.66	14.68	14.66	0.02
20050702	21:50 EDT	14.66	14.73	14.68	14.69	0.03
20050702	21:50 EDT	14.68	14.74	13.74	14.39	0.46
Average		14.62	14.69	14.44		
Standard Deviation		0.06	0.06	0.35		

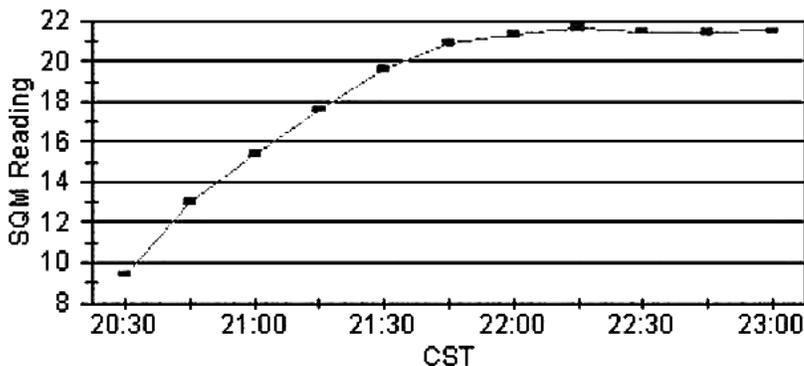
Data subset #2

At the Summer Saskatchewan Star Party in late August, 2006, we took a series of readings 15 minutes apart from just past sunset as long as I could stay awake :)

	CST	SQM
20060827	20:30	9.39
20060827	20:45	13.05
20060827	21:00	15.39
20060827	21:15	17.61
20060827	21:30	19.60
20060827	21:45	20.93
20060827	22:00	21.37
20060827	22:15	21.66
20060827	22:30	21.50
20060827	22:45	21.44
20060827	23:00	21.51

SQM Time sequence

Cypress Hills 2006 August 27



These data confirm that astronomical twilight (Astronomical twilight is defined to begin in the morning, and to end in the evening when the center of the Sun is geometrically 18 degrees below the horizon.) is a little more

than one hour past sunset and settles down pretty quickly after that.

History:

We were at a meeting of the North York Astronomical Association (NYAA) in the spring of 2005 in Toronto, where Dr. Doug Welch from McMaster University talked about measuring light pollution using a custom built Sky Quality Meter. Being very interested in Responsible Lighting and Light Pollution, we purchased one, had it delivered shortly and started using it.

Usage:

Some of the tips we would like to pass on when using the SQM,: use it after astronomical twilight, point it straight up at the zenith and try to measure on moonless, cloudless nights. We typically take 3 readings in quick succession and average them out. We record the temperature as well, as the unit provides that information.

Logging:

Log entries typically contain 3 readings, the temperature, location, date and time (local), timezone and an indication of moon, clouds, and twilight. We add in detailed location data (latitude and longitude) later on.

Plans:

We plan ongoing research on two main subjects, localized readings in our general area and readings over long term periods of time. The first will give relative values to various sites, of our members, of our observing areas and of any potential permanent facility sites. The second will tell us how much and how fast the light pollution problem is growing.

SQM Summary readings

The data at the top of the page do not necessarily state how "good" any one sight is over another, but more of a random snapshot in time of the readings of that time.

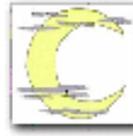
References:

Sky Quality Meter:

<http://www.unihedron.com/projects/darksky/>

Starlight Cascade page: <http://starlightcascade.ca/sqm>

Raw Data: <http://starlightcascade.ca/sqm/sqmrawdata20060915.pdf>



A Dome on a Home: The Story of Winchester Observatory

Walter MacDonald

Part 2 Automating the Winchester Observatory

After a number of all-night sessions following which I would stumble downstairs to bed at 5 am only to have to get up at 8am, I thought there must be an easier way to get full utilization of all the available clear skies. Not only was this mode of observing extremely tiring, it was also extremely repetitive and boring: focus the camera, move the scope, correct any pointing error, take some pictures, repeat ad nauseam! (Don't get me wrong: CCD imaging is great, but the novelty of running the equipment manually wears off sometime after the ten thousandth image or so!) Fortunately I was aware of the existence of some automation software for Astronomy; soon I had downloaded trial versions of a couple of DC3 Dreams software packages, ACP and PinPoint, which were the final two pieces (as it turned out) that I needed to automate the observatory.

ACP is a script engine that orchestrates all of the equipment -- telescope, focuser, camera, and dome -- and allows all-night unattended operation. PinPoint supports ACP by providing plate solutions -- it can actually analyse the pattern of stars in an image and tell where the telescope is really pointing! The practical upshot of this is that ACP is able to correct for any small (but still significant) pointing errors made by the telescope. (Currently the pointing tolerance is set at two arc minutes, so ACP will do one additional slew to correct the pointing if the initial pointing is off by more than this amount.)

Automation was a new dimension that I hadn't considered when I first started in on this observatory project. Sure, I had hoped to run semi-automatically from the control room for an hour or two at a time, but not completely automatically all night long! It just happened that since I already was doing CCD imaging, and had already bought the DigitalDomeWorks controller, I was already most of the way to a robotic observatory! Sometimes the universe does just unfold the way it should...