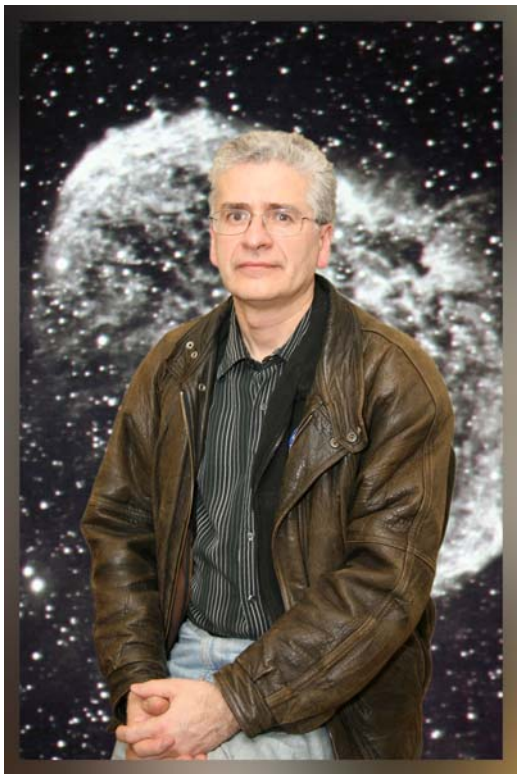
ASTROTENT

May 2007

Serge Théberge was the featured speaker at April's NYAA meeting. Serge is a dedicated astro-imager whose work can be seen on the *Sky News* Picture of the Week website. Those of you with RASC memberships may also have seen some of Serge's deep-sky images in *The Journal* or in the RASC newsletter. Serge took up the pastime of deep-sky imaging only fairly recently, but has proven to have both the talent and skill to produce high quality pictures.

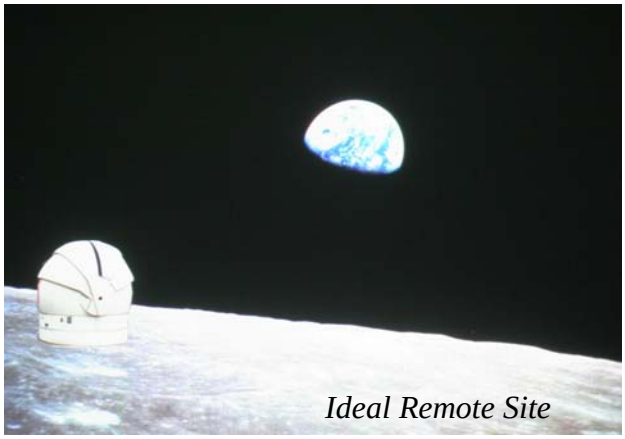


Serge with his image of NGC6888 in the background

In the beginning Serge, who lives in Toronto, would spend much more time taking his telescope, CCD imager and other sundry equipment to a dark-sky site than actually using the equipment for imaging. The old scenario went something like this:

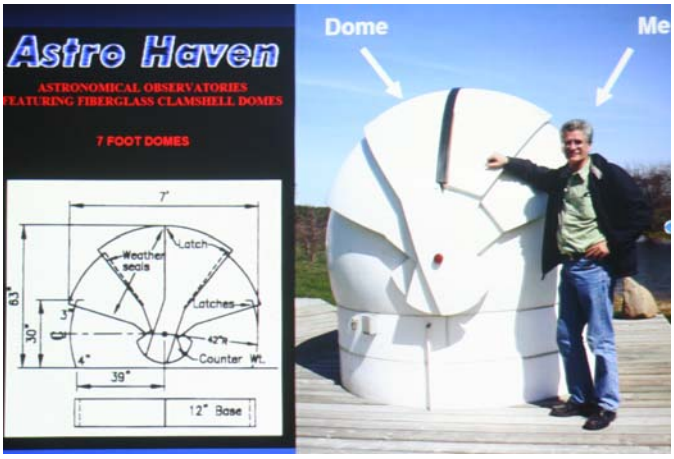
- Check ClearSky clock
- Do I have to work tomorrow?
- Drive to dark sky site
- Set-up
- Image (if sky still clear)
- Take-down
- Drive back

Serge reasoned that a remotely-controlled telescope at a dark sky site would boost his productivity immensely. The perfect site would have a high percentage of clear nights



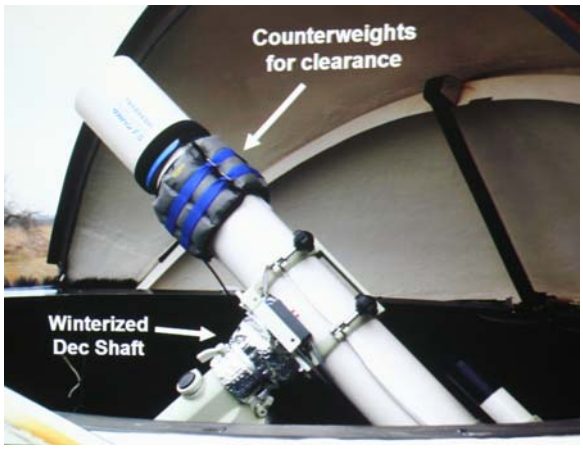
Ideal Remote Site

A Better Choice



and excellent seeing conditions, as well as being physically accessible for maintenance or upgrades. Serge settled on the ROBOSKY site near Orangeville. A clamshell-type dome would house his telescope. A dome-type observatory is more resistant to the type of high winds that could turn a roll-off roof into a flying roof. A clam-shell dome can be left fully open at the start of an observing session to allow the telescope to cool to near ambient temperature. Serge generally images objects within 50 degrees of the zenith so the clam-shell can be partially closed to provide a wind-break during imaging.

Serge uses a 6-inch Takahashi fluorite doublet with a field flattener to provide pinpoint star images across his ST10XME CCD camera. This particular camera has a 90% quantum efficiency. (Standard CCDs are around 30% and film is just a couple of percent.) The CCD does not have anti-blooming (which would reduce QE), but Serge keeps his exposures shorter than 5 minutes. Using a CFW8 filter wheel, he can construct full colour images using multiple exposures through different filters.



The equipment fits snugly inside the dome. A counterweight is used at the objective end of the telescope to balance the equipment at prime focus. The GO-TO mount is supported on a massive concrete pier. A computer is used to command the GO-TO mount as well as control telescope focus, operate the dome and operate the CCD camera and filter wheel. Separate (battery backed-up) power supplies are used for the telescope, dome motor and computer.

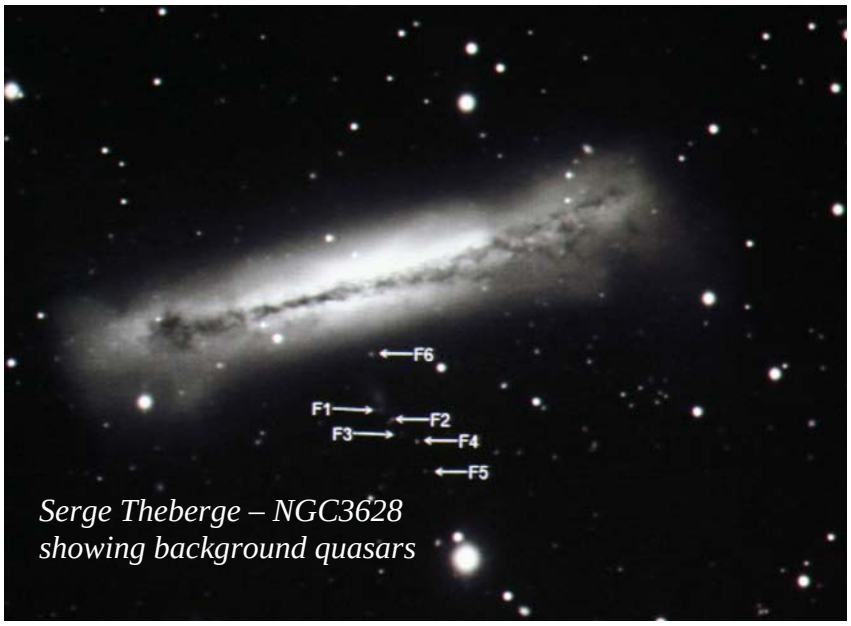
The extreme cold of a mid-winter's night can cause the RA and Dec shafts to seize up due to ice formation, so a heating coil is used to prevent condensation in these areas. A sophisticated weather monitoring system is used to measure several environmental parameters such as cloud cover, wind speed, wind direction and temperature. A rain (or snow) detector is used to initiate dome closure when

necessary. These "safety functions" are triggered by a monitoring program on the computer without the need for operator intervention.

In fact, much of the operation is via computer "scripts". Direct control of the telescope from a remote location can lead to problems – imagine what could happen if the link was broken just after issuing a "slew" command.
Serge's new operating paradigm is:

- Check ClearSky Clock
- Log onto ROBOSKY site
- Check local conditions
- Set up schedule for imaging
- Press "GO"
- Enjoy the evening and get a good night's rest
- Check status in the morning
- Get the night's images

OK maybe it's not quite that simple, but Serge is now able to obtain images on any clear night.

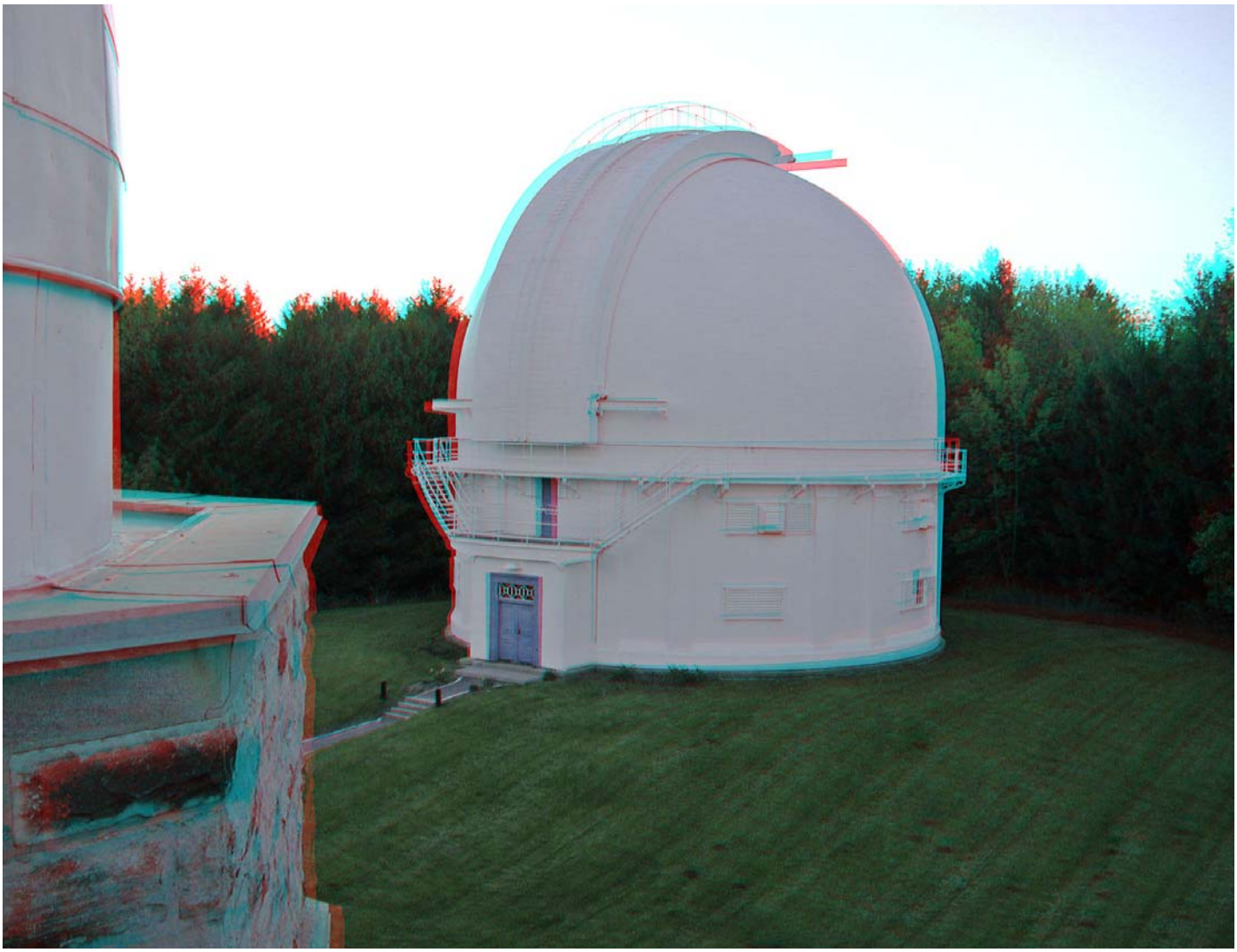


Serge Theberge – NGC3628 showing background quasars

Serge Theberge – NGC891

Congratulations to **Richard McWatters**, the Otmar Eigler award recipient for 2007. Richard has been a dedicated member since the founding of the NYAA. His latest effort has been to lead the club's Remotely Accessible Telescope project.


EXIT



Use red-cyan glasses to see the DDO in 3-D!