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Figure 3 — 50′ X 50′ POSS image of the field that includes NGC 4244.

that is thought to be the remnants of previous mergers with other galaxies. It is part of the NGC 4631 group of six gravitationally bound galaxies, has a maximum rotational velocity of about 100 km/s, and a diameter of 65,000 light years.

In the eyepiece, its moniker as the "Silver Needle Galaxy"

Figure 4 — Image of NGC 4244 courtesy of John Mirtle, taken with a manually guided 8-inch f/6 Newtonian on hypered Tech Pan film; 45-minute exposure from Wilson Coulee Observatory, Alberta, 1991 April 6.

is apt, but don't take our word for it: have a look at this beauty in the eyepiece and see what your scope shows of this fine object.

Warren Finlay is the author of Concise Catalog of Deep-Sky Objects: Astrophysical Information for 500 Galaxies, Clusters and Nebulae *and is a professor of engineering at the University of Alberta. Doug Hube is a professional astronomer actively retired from the University of Alberta, and Associate Editor of this* Journal.

Through My Eyepiece

Peas in a POD

by Geoff Gaherty, Toronto Centre (geoff@foxmead.ca)

I've always wanted an observatory of my own. Having the use of the Montreal Centre's observatory as a teenager was always a big thrill. After decades of setting up my telescope every night and, worse still, having to tear it down at the end of the evening, I longed to have a permanent setup where I could just walk out, open up, observe, and then shut down in just as short a time when I started to get cold or tired.

I looked into various alternatives over the years, but they were all either too pricey for my pocketbook or too complex for my limited do-it-yourself skills. The one ray of light in all this was in a talk at the Toronto Centre by a fellow named Wayne Parker. Most Canadians perhaps best know Wayne as the bass player in the band Glass Tiger, but he is also an amateur astronomer. His talk was about a company he had recently started to build relatively inexpensive roll-off roof observatories, which he called *SkySheds*. I was particularly impressed by his emphasis on good engineering design and simple, inexpensive technology. From time to time, especially when I moved out of the city, I thought of getting his company to build me a *SkyShed,* but the price was still an obstacle.

Then at the Ottawa General Assembly (GA) last year, I picked up a one-page black-and-white flyer in which he announced a new venture: the *SkyShed POD* — a molded plastic observatory for an unbelievably low price, $1000 US. Knowing the care Wayne put into his *SkySheds,* I was pretty sure this would be a winner, so I signed up for his pre-order list, and joined the *SkyShed POD* Yahoo Group.

Because of Wayne's desire to do things right the first time, it was only around the time of this year's GA that *POD*s actually started to ship. The price had also crept upwards a bit. Wayne was entirely upfront with his potential customers about this, sharing with us the vicissitudes of mold making, hardware shopping, and beta testing. When my *POD* was ready in the second week of July, a friend picked it up from the factory near Owen Sound and delivered it to my farm: ten gigantic plastic moldings and a box of hardware.

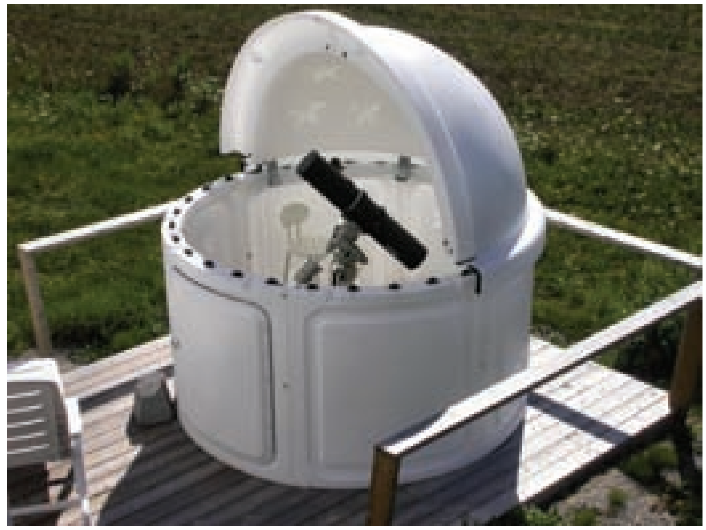
Most people apparently can assemble a *POD* in a few hours but, as I mentioned, my DIY skills are severely limited. I'm one of those rare individuals who can read the manual; in fact, I can't really do something *unless* I have a manual. Wayne supplies a wonderful video tutorial on how to assemble the *POD;* unfortunately, I'm almost totally incapable of learning in visual mode. As a result, it took me a few *weeks* rather than hours to get my *POD* assembled, but with a couple of phone calls from Wayne and a little help from family and friends, I finally got it together for first light on July 29.

In this picture, you can see the basic design of the *SkyShed POD:* five wall pieces and a door piece (at left) 1.2-m tall support two nesting half domes atop many roller-skate type wheels. The dome itself is 2.3 m in diameter and 1.1-m high. The whole structure weighs a little over 300 kg.

There are three main limitations of this design: its interior diameter, the height of its walls, and the overlapping dome halves, which block the zenith if the telescope is placed in the exact centre of the *POD*. These combine to put certain limits on the size and configuration of the telescopes you can place in it. Wayne has worked hard to maximize the versatility of the *POD,* but there are some things it just can't do. One of the first things I wanted to do was try a variety of my telescopes in the *POD* to see what would work best.

As you can see in the picture above, it is not terribly well suited for a Dobsonian the size of my 28-cm f/4.3 *Starmaster*. Sitting flat on the floor of the deck, I can't observe anything below about 40° altitude. I experimented with concrete blocks to raise the height of the telescope's base. By raising it 30 cm, I could just see Jupiter over the wall when it was on the meridian; 40 cm was better, but that put the eyepiece 'way too high when observing close to the zenith.

The *POD* works much better with shorter telescopes. Here it is with my Intes 15-cm Maksutov-Newtonian mounted on a Vixen GPDX mount:



This, as you can see, is a much better fit. Almost the entire sky is available for viewing, right down to the horizon. Interestingly, because of the offset east and west of the meridian that you get with a German equatorial mount, the zenith is also accessible with this setup. Similarly, my Orion 10-cm f/9 ED refractor on the same mount worked really well, with a slightly higher pier. However, the real winner was my Celestron *NexStar* 15-cm Schmidt-Cassegrain. By offsetting this a bit to the south of the centre of the dome, I could almost access the zenith, could view down to the horizon in all directions, and could observe anywhere in the sky while seated comfortably. The 15-cm SCT became the regular resident of the *POD*.

Needless to say, I began to feel frustration at not having my usual 28 cm of aperture available to me, so I came to a decision. If a 15-cm SCT worked so well in the *POD,* wouldn't a larger SCT work equally well? I've been extremely pleased with the optics, mechanical solidity, and computer accuracy of my *NexStar,* so an upgrade to a larger SCT made sense. I ordered a Celestron CPC 1100 28-cm SCT, and three weeks later it arrived and was immediately installed in my *POD,* where it is now my main instrument.

The 28-cm is a lot bulkier than the 15-cm, but it doesn't take up that much more floor space. There is still room in the *POD* for my somewhat bulky self, plus an observing table and an adjustable observing chair. Some might call it snug, but I prefer to think of it as cozy, and my scope and I are as comfortable as two peas in a pod — well, actually a *POD!*

What was immediately noticeable with this new setup was that my observing sessions have become longer, even in colder weather, because of the protection of the *POD*. Dew becomes much less of a problem because a lot of the sky is blocked. The accurate GoTo of the CPC 1100 means I can make more variable-star estimates in a given time period, so my productivity has increased. My main loss has been in field of view; the 28-cm SCT maxes out at about 1 degree, so I'm now using AAVSO "d" charts or larger almost exclusively.

I had not anticipated that purchasing a *POD* would lead to buying a new and rather expensive telescope, but the setup seems a really good fit for my current observing interests and situation. So far the *SkyShed POD* has lived up to its promise, and everyone who sees it seems to want to own one. Even my non-astronomer friends see in it a wonderful ice-fishing hut!

Geoff Gaherty is currently celebrating his 50th anniversary as an amateur astronomer. Despite cold in the winter and mosquitoes in the summer, he still manages to pursue a variety of observations, particularly of Jupiter and variable stars. Though technically retired as a computer consultant, he's now getting paid to do astronomy, providing content and technical support for Starry Night Software.

Pixellations 1

by Jennifer West (westjl@cc.umanitoba.ca) and Ian Cameron (icamern@cc.umanitoba.ca), Winnipeg Centre

Digital cameras offer a multitude of often-confusing choices to the user regarding image format, resolution, quality, noise reduction, and ISO speed, among others. In addition, the user can choose to correct images using calibration frames such as darks and flats, or take multiple exposures to combine using a computer. We plan to discuss these options in future articles. To start with, we are going to use a simple scenario. We have obtained a single image of the North America Nebula using a Canon 20Da Digital SLR camera set for a 300-second piggy-back exposure and using a 55-mm lens at f/5.6 and ISO 1600 (Figure 1). Noise reduction was turned off and the file was saved in jpeg format.

Figure 1 — Cropped portion of the original, unprocessed image.

So we have an image. Now what? The first decision to make is which image-processing package you will use. There are many choices available, but for this series, we are going to try to focus on things that can be done with almost any package, so use what you have and what you are comfortable using. For our examples, we will use a combination of *Photoshop CS 2, Photoshop Elements, GIMP,* and *ImageJ*. *Photoshop* is the industry standard image-processing package, however it is very expensive. *Photoshop Elements* is capable of making most of the adjustments we will discuss, is less costly, and is often bundled with many digital cameras. *GIMP* and *ImageJ* are both free, open-source packages that can be downloaded from the Internet. All packages are available for Windows and Mac, while *GIMP* and *ImageJ* are also available for *Linux*. *ImageJ* (West and Cameron 2006) is unique among the above-mentioned packages in that it is designed for analysis and thus is capable of measurements that are more specific. Some operations are much easier to perform in *ImageJ* than in most other packages for this reason.

The first and simplest adjustment that most people perform on a digital image is the brightness/contrast adjustment. But what exactly does it do and how can we make more-intelligent decisions about the settings instead of blindly fiddling with sliders?

First of all, we need to know that a jpeg image uses what is known as 24-bit colour. This means that there are three channels: red, green, and blue. Each of those channels is an 8-bit monochrome image that when combined give us colour. An 8-bit image has 256 levels of grey going from black (= 0) to white (= 255). The "luminance" of an RGB image is a weighted average of the individual R, G, and B values.

A histogram is a plot that indicates the number of pixels that have a particular value. Astronomical images present a challenge since many of the pixels will be very dark or close to