

# Nightfall 2014

David Nakamoto

( [dinakamoto@hotmail.com](mailto:dinakamoto@hotmail.com) )

## Astronomy in a Desert Paradise

The Palm Desert Resort. Air conditioned rooms, pool and Jacuzzi, good eating places in town less than a mile away, and lots of fellow amateurs to talk shop with. Who could ask for more?

This was the 21<sup>st</sup> such event. Since they skipped holding the event a few years ago due to problems getting the resort ready, this whole thing started in 1993 when the organizers of RTMC decided that they had to keep that event on Memorial Day for lots of good reasons; a recent switch to another weekend in May apparently didn't go very well as far as attendance was concerned. So they decided on a New Moon night at the end of summer, to bookend RTMC at the beginning of summer. So Nightfall was born.

Gradually they moved it a bit later in the year, when it became apparent that in September the desert was subjected to occasional monsoonal flows that caused night time temperatures and humidity to go to 90/90, with 2 arc-minute seeing, thunderstorms, and occasional flooding.

I've been attending every year except for a span of several years in the 2000s when I lacked the spare funds. In the beginning, it was only one night as memory recalls, but soon the attendance rose and the demand for more nights grew until it is now held over three consecutive nights. That turned out to be a Good Thing this year, as the weather didn't cooperate on two of the nights, but more on that later.



Palm Desert Resort is an RV camp as well as a hotel, so you can pick your accommodations. This year marked the most extensive use of the RV sections ever, and as this picture gives some indication, the place was crammed with LARGE RVs. Judging by the equipment most of these guys had, the expansive room inside these behemoths was NOT for equipment transport. ☺

The days were hot and the nights were warm so you could wear short sleeves right up to 2:30am when I packed it in on Friday and Saturday mornings.

Once again it was proven that one must "look" for oneself to see if objects are worth looking at. Published magnitude estimates treat an object's brightness as if the entire object were condensed to a point. This is why such famous objects as the Triangulum galaxy or the Pinwheel galaxy are a lot fainter than these estimates would make you think.

And images only give a vague idea of how they appear in the eyepiece, or even a camera. The famous Crab nebula comes to mind.

Still, such all-sky surveys like the Digital Sky Survey (DSS) can provide some idea of how large the object MIGHT appear, even if the object is much fainter than the images show. Open and globular clusters, and many planetary nebulas often appear close to what those images show, if the object is not too faint. Emission and diffuse nebula, and galaxies, are more iffy. But a black and white image cannot show what might appear to the camera, and sometimes to the eye, especially in large telescopes.

## **Oct 23<sup>rd</sup>, Night #1**

Seventeen objects were imaged. One was the Flame, NGC-2024, also known as Sh2-277. Another was the Horsehead, Barnard-33, imbedded in IC-434, but it was SO dim that I couldn't get a single good image of it, since my exposure times were limited to 40 seconds due to tracking issues.

So of the seventeen, only two objects came out well. The best is probably the Flame nebula, just off the eastern-most star in Orion's belt. I didn't record the exposure time, but it was probably 30 to 40 seconds. This is a stack of two images taken with my Orion G3 color camera through my Orion 10-inch f/4.5 Newtonian on an EQ-G mount. But stacking only a few images brings almost unnoticeable improvements. This is probably a dark nebula silhouetted against an emission nebula. The reddish color of the bright portions are the emission nebula part, red due to the hydrogen-alpha line from excited hydrogen atoms.



Probably the second best image was the small but beautiful spiral galaxy NGC-157 in Cetus, a 60-second exposure. Lots of knots caused by H-II regions filled with young, bluish stars. As I recorded in my journal, the core was faintly visible in a 20sec 2x2 binned exposure, so this is a relatively bright object. Still, it was a shock to see such detail even in the original uncolored raw image.



### **Oct 24<sup>th</sup>, Night #2**

This night was, for most observers, a half-night, as clouds rolled in from the south/south-west around midnight. Almost everyone packed it in for the night, but I waited with Victor from Woodland Hills Camera until 1:30am when the clouds rolled out. I went on until after 3:30am.

I managed to image 26 objects! Here are the keepers.

The first was the planet Neptune. I had already captured it during the October 4<sup>th</sup> Griffith Observatory public star party, but I wanted a better image. At these relatively low magnifications, imaging Neptune, the bright object nearest the center, was not the aim. But capturing Triton was. That's it, very close to Neptune and on its 5 o'clock position. I hoped to image 19<sup>th</sup> mag Nereid with a 30-second exposure, but unfortunately Nereid remained invisible. It is in the field of view, about a third of the way from Neptune to the upper left corner, but nothing was recorded in the position where it should be.



NGC-1365 in Fornax is one of those classic barred spirals, and relatively large as galaxies go. But it has been the bane of my imaging experience. I have not got a decent image of it yet, despite going through four different scopes (a Celestron f/10 C-5, a 5-inch f/5 refractor, a 5-inch f/12 Maksutov, and now my 10-inch f/4.5 Newtonian), and at least three cameras (two from Starlight Xpress and my current Orion G3 camera). Although this is still not a good image, I've included this 40 second image because I finally got at least the bar of the spiral well enough to show the dust lane across the eastern portion of the bar. The spiral arms are another matter, as they are for galaxies. They're usually at least a couple of magnitudes fainter than the core regions.



An easier and brighter object was NGC-613, captured with a 40 second exposure. It's located out in the western regions of Sculptor. This is a distorted barred spiral. Although the distortion of the spiral shape is probably due to an interaction with a smaller galaxy, no such galaxy is evident. Also strange, the northwestern arm appears to spiral around the core completely, while the southeastern arm terminates after only a quarter of the way around the galaxy. The southeastern arm also appears to be brighter and bluer compared to the northwestern arm, which probably means it is undergoing a sharp increase in star production, especially young blue stars, but why?

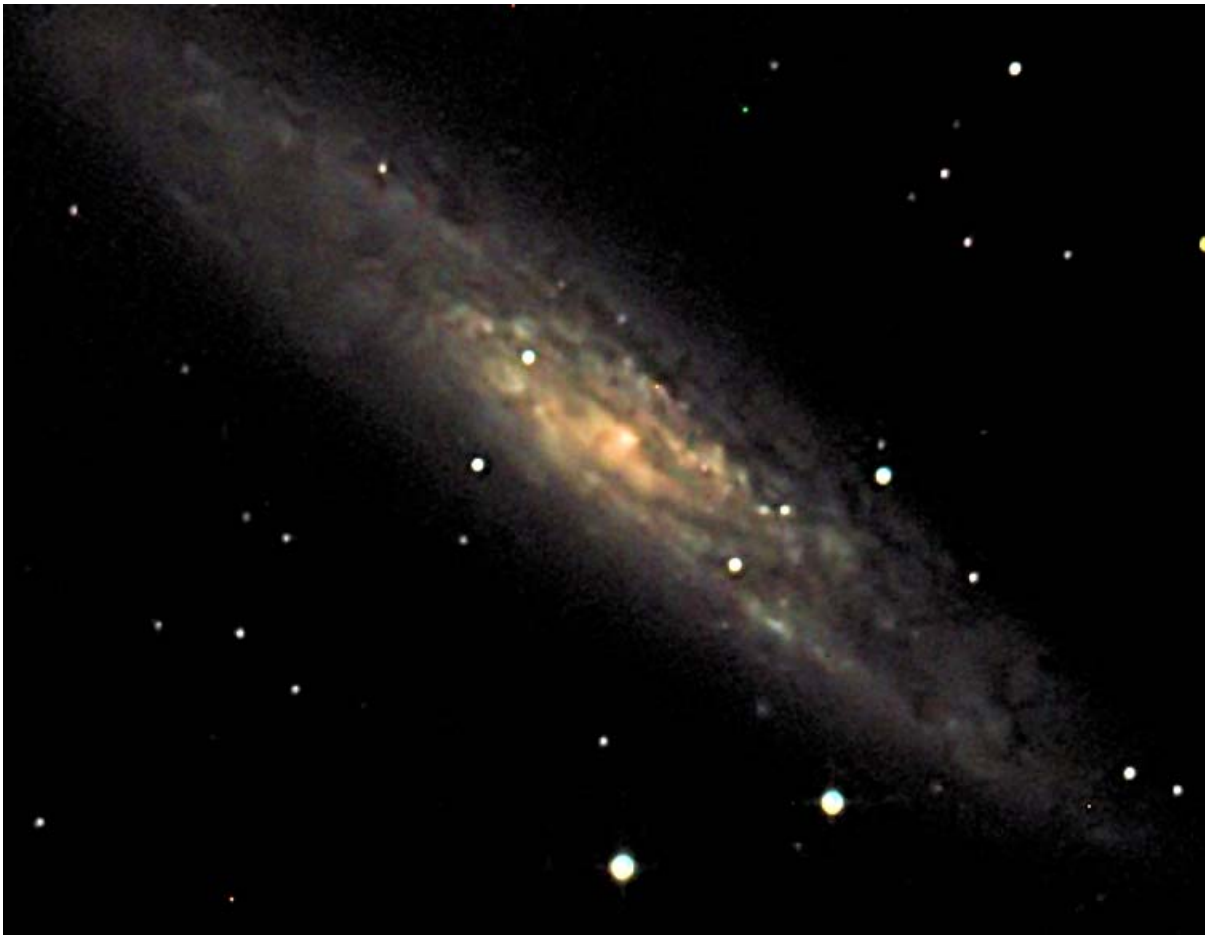


Also in Sculptor, NGC-55 would normally not be a keeper, except that when I processed the 40 second image, bright blue regions appeared. The actual size of the galaxy extends well beyond the field of view of my camera. If this is a spiral galaxy, it must be heavily distorted, but there is a hint of a barred structure extending east and west beyond the small and relatively faint core.



The most spectacular image that night was the large tilted spiral galaxy, NGC-253 in Sculptor. I remember that the entire galaxy appeared as a fuzzy glow in a 20 second 2x2 binned image. The core itself was visible in the 1 second 2x2 search images. The colors and the amount of detail are incredible in this 40 second exposure. The knots immediately surrounding the core appear reddish, while others further out appear whitish to bluish white. The dark halo around the brighter stars is due to a little over aggressiveness using an unsharp mask. Again, as with NGC-55, NGC-253 is larger than the 18 arc-minute field of view width in my image.





### **Oct 25<sup>th</sup>, Night #3**

The last night was a short one, thanks to a couple of factors. One was sleep; the next day would be the drive home, and as I had stayed awake until around 3AM in the morning Thursday and Friday I was a bit tired. The second was that clouds rolled in again, this time from the north, and this time it looked like these were going to stay, an opinion verified the next morning. I also had problems trying to get all the equipment to talk to the laptop, delaying observing until 8:30PM or so. Hence, I only imaged eight objects. I looked at a lot more, as I do during all my observing sessions, but a quick look with a 20 second exposure with 2x2 binning will tell me if the objects is bright enough to warrant a high resolution, longer exposure.

And tracking problems kept vexed me. For instance, I tried over and over to get a 60 second image of the Crab nebula, M-1 or NGC-1952, but to no avail.

Woodland Hills Camera and Telescope had representatives and a tent set up right next to where I had set up; convenient! I talked to Victor who showed me a combination of the Santa Barbara Imaging Group (SBIG) ST-i with an Astro Optics finder. I was so sorely tempted due to my experience after Thursday and Friday nights. When I got back into town temptation won out.

The second-best image from that night of meager pickings is probably the open (galactic) cluster NGC-1245 in Perseus, taken with a 40 second exposure. I decided on such a long exposure because this is a faint cluster. I barely saw it in a 20 second 2x2 binned image, which tipped me off to its faintness. I normally reserve such long exposures for galaxies. I love the star colors. Probably many of the brighter stars are actually foreground objects, since Perseus is along the Milky Way. Notice that many of the stars line up in curves; the distribution is not even or random appearing. Especially, notice the small half circle of stars near the center of the image. Also that most of the fainter ones, which I take to be part of the cluster, are bluish, so the cluster is probably young, in the tens of millions of year range, similar to the Pleiades.



But the best image was of M-33, the large face-on spiral in Triangulum. This can be a notorious object to see and image, because despite its nearness to us, it has low surface brightness. Surface brightness is the average brightness of the object per unit area of the sky, say, 1x1 arc-minute. It's one of the few objects where binoculars provide a good view, due to the wide field of view. So I used the relatively dark skies of Borrego Springs, compared to my driveway in the east San Gabriel at least, to try and get the background brightness down. On low surface brightness objects, this is more important than exposure times, and hence even imagers treasure and seek dark skies for these objects. A single 45 second image managed to grab it. Although the image is not as sharp as I'd like it, it is for me the treasure from this event. The large number of stars in the image is explained by remembering that this object is near the Milky Way, so more of the stars in our galaxy will be visible.



And so an early end to this year's Nightfall star party. I highly recommend this event to all. I feel it trades a little of the dark sky conditions we like as astronomers for more comfort, especially for families. And the skies may be darker than you might expect. Don Pensack, who has attended Nightfall as long as I have, had one of those meters to measure sky darkness, and reported I think mag 21 skies last year. The resort takes care to use just red lights after dark, and other precautions to provide a welcoming dark sky for observers. This year more RVs showed up than before. But make your reservations early, say in December. The resort is usually booked up early for the next year's event.

A tip of my cap and a heart-felt thanks to the organizers and sponsors, which include Woodland Hills Camera and Telescope, who provided me (OK, I bought it) with a red light when I found I neglected to pack one, and a better laser collimator. They also convinced me, eventually, to get an autoguider as the cure to my tracking problems. I think it'll be a good investment, and hopefully will eventually allow me to take full advantage of my equipment.

Clear and Steady Nights to all!