A Shameless Plug:

Let's Go Observe!-ing!
by Doug Scobel

No, that's not a typo, it's exactly as I intended it. "Observe!-ing!". Huh?

Before I answer that, let me ask you some questions. Are you a deep-sky observer? Suppose there exists a software program that lets you search a database of over 10,000 deep sky objects to generate a list of targets for a night's observing? What if this program also lets you narrow the search to particular object type(s) such as planetary nebula, galaxy, multiple star, Herschel 400 object, etc., constellation(s), and limiting magnitudes? And suppose you could instruct it to find or not find objects you've already observed before? And what if for each object it could give you the chart number on which it appears from a number of modern star atlases? And when it was done, it sorted the list so that the objects appear in the list in the optimal observing order for that night? How much would you pay for such a program? Before you answer, wait - there's more! What if you could also export the list to a file that you can import into SkySafari for use on your smart phone or tablet at the telescope? Or export the list to a dataset that will automatically load into the Guide planetarium program? Now how much would you pay?

The answer is "nothing"! I have just such a program that I have been using for more than twenty years to plan my own observing sessions. It has seen me through the observation and logging of more than 1,300 deep sky objects. If you think that you too could make use of it then I can give you a copy. For free! I can do this because I wrote it myself.

The program's name is "Observe!". It started out, back in the late 1980's, as a way for me to find interesting objects to observe with my then new 13" Dob. I had completed that scope in 1984, and after seeing all the Messiers and some of the brighter NGC objects I needed some kind of tool to help me find objects beyond the usual and typical showpieces. I didn't know of any suitable commercial software at the time, so being a software engineer by trade I decided to write my own.

The program started out as a primitive database search program, first using an electronic version of the Revised New General Catalog of Non-Stellar Objects (the RNGC), and then later using version 5.0 of the Saguaro Astronomy Club's database. Doug Nelle had acquired a pair of floppy disks containing the database, and I wrote a Pascal program for doing some basic searches around it. (Yes, Pascal is something of an archaic programming language today, but back when I first started writing Observe! it wasn't. The company I worked for at the time used Pascal for all its products, so that's what I used.) As time went on I added new features, and new capabilities, until I could quite easily, and in very short order, create a custom observing list for a night's worth of observing. It wasn't pretty, without a nice, graphical user interface – it simply ran in a Windows DOS command window. But the lists of formerly unobserved objects I could create with it were extremely handy.

Today, it still runs only in a Windows command window (sorry, Mac users), and it is still without a pretty GUI. But yes, believe it or not, I *still* use it! I'm writing this because I've just completed giving it a complete facelift. With my new, larger scope that can reach fainter targets, and with the number of objects I've observed already, I needed some enhancements to help me find more esoteric targets to observe. Around Christmas time I started adding some new search types, and upgrading it to use the latest version (8.1) of the SAC database (found here: http://www.saguaroastro.org/content/downloads.htm). Before I knew it I was revamping pretty much the entire interface, limited as it is, to make it easier to do stuff with it. It still does essentially the same things, it's just a lot easier to do them now.

So what does Observe! let you, the potential user, do? It lets you:
- Define up to 100 observing sites, where you define each site's latitude, longitude, and time zone. It even comes pre-loaded with a site for Peach Mountain!
- Select a time, place, and duration for an evening's observing. To this end, Observe! computes and displays that day's and evening's sunset and sunrise, end of evening and start of morning astronomical twilight, and moonset and moonrise.

- For each observing session, you can specify any combination of search criteria, including when you plan to start and stop observing (including avoiding observing while the moon is up), the type(s) of objects to observe, the constellation or constellations within which to search, limiting magnitude of the objects (to let you customize the list to your scope's aperture and/or your site's light pollution level), the altitude threshold above which objects must rise above from your site, and whether to include objects you've not observed yet, or have observed, or ones you want to revisit, or any combination.

From your search criteria, Observe! generates a list of objects that match your search criteria. Moreover, the objects are inserted into the list such that those that set the earliest during your observing session are at the start of the list, while those that will be available later in the night will appear near the end of the list. In other words, it puts them into the list in the best order for observing that night. It also automatically handles Daylight Saving Time, even on spring ahead/fall back nights.

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★ Observe!

OBSERVING SITES:

                                                    Latitude      Longitude       Time     Apply
  #     Name ("*" denotes favorite site)          deg min sec   deg min sec     Zone     DST?

  1 -   Atlanta, MI (CLEAR/Diane Ives's farm)      45   1  26    84  16  23    Eastern    Yes
  2 -   Camp Billy-Joe, Kenton OK - Okie-Tex Star Party   36  53  52   102  57   7    Central    Yes
  3 -   Camp Shaw-Waw-Nas-See, Kankakee IL - Astrofest    41  13   0    87  58   0    Central    Yes
  4 -   Cherry Springs State Park, PA - Black Forest Star Party   41  39  45   77  49  25    Eastern    Yes
  5 -   Cranbrook Institue of Science, Bloomfield Hills MI   42  34  59   83  14  42    Eastern    Yes
  6 -   Gladwin, MI - Great Lakes Star Gaze        43  57  25    84  38  46    Eastern    Yes
  7 - * Home (1426 Wedgewood Dr., Saline MI)       42  11  34    83  42   6    Eastern    Yes
  8 -   Lake Hudson State Rec Area, MI             41  50  14    84  14  40    Eastern    Yes
  9 -   Lakeland, FL                               28   2  28    81  57  32    Eastern    Yes
 10 -   Nebraska Star Party, Valentine NE          42  40   0   100  55   0    Central    Yes
 11 -   Peach Mountain, Dexter MI                  42  23  31    83  56  13    Eastern    Yes
 12 -   Prude Ranch, Fort Davis TX - Texas Star Party   30  36   0   104   0   0    Central    Yes
 13 -   Seven Sisters Observatory, Manchester MI (Clay Kessler)   42   9  28   84   5  34    Eastern    Yes
 14 -   Spruce Knob, WV - Almost Heaven Star Party   38  40  36   79  34   2    Eastern    Yes
 15 -   Summerland Key, FL - Winter Star Party     24  42  32    81  26  14    Eastern    Yes


Enter the number of an observing site to edit, or
Press A to add a new site,
      E to edit an existing site,
      R to remove an existing site,
      C to consolidate duplicate sites,
      F to set your favorite observing site, or
      ENTER to save your changes and/or go back to the main menu: _
```

Here's an example of how you set up your observing sites. This is my list of sites.

```
★ Observe!

SEARCH FOR THESE OBJECT TYPES: (none marked with an * means ALL):

  1 -   Bright Nebula
  2 -   Cluster with Nebulosity
  3 -   Galaxy
  4 -   Globular Cluster
  5 -   Open Cluster
  6 -   Planetary Nebula
  7 -   Asterism
  8 -   Dark Nebula
  9 -   Galaxy Cluster
 10 -   Supernova Remnant
 11 -   Quasar
 12 -   Messier object
 13 -   Caldwell object
 14 -   Herschel 400 object
 15 -   Herschel II object
 16 -   Bright Arp Galaxy
 17 -   Flat Galaxy
 18 -   Galaxy Trio
 19 -   Herschel 2500 object
 20 -   Object in Burnham's Celestial Handbook
 21 -   Object in S&T's Pocket Sky Atlas
 22 -   SAC's "Best of NGC"
 23 -   SAC's "Best of non-NGC"
 24 -   Diffuse Nebula in a Galaxy
 25 -   Globular Cluster in a Galaxy
 26 -   Cluster with Nebulosity in a Galaxy
 27 -   Cluster with Nebulosity in the LMC
 28 -   Diffuse Nebula in the LMC
 29 -   Globular Cluster in the LMC
 30 -   Open cluster in the LMC
 31 -   Cluster with Nebulosity in the SMC
 32 -   Diffuse Nebula in the SMC
 33 -   Globular Cluster in the SMC
 34 -   Open cluster in the SMC
 35 -   Unverified Southern Object
 36 -   Multiple Star
 37 -   Nonexistent in RNGC

Enter number of object type to select/unselect, or
press ENTER for all object types, or
      B to go back and restart the search request: _
```

Here's the list of object types you can search for.

You have full control over the information listed with each object in an evening's observing list. You can specify which of the following to include or not include in your observing lists:

- Whether or not it is a Messier, Caldwell, Herschel 400, Herschel II, or Arp galaxy.
- Object type, brightness (including surface brightness when available), size, and what constellation it is in.
- The time the object rises above your altitude threshold, when it sets below the altitude threshold, and when it transits the meridian.
- What star atlas chart(s) the object appears on, where you can choose any of Sky Atlas 2000, Uranometria 2000 (both old and new editions), Millennium Star Atlas, Sky and Telescope's Pocket Sky Atlas, and the "C" charts in the Herald-Bobroff Astroatlas.

In addition, Observe! lets you interface to a couple of popular planetarium/sky charting/telescope interface programs:

- If you use SkySafari then you can ask Observe! to write the list to a "Skylist" file that you can import into SkySafari.
- If you use the Guide planetarium program then you can ask Observe! to write the list to a dataset that you can view in Guide.
- If you use some other program, then you can write your observing list to a CSV-formatted text file that many other astronomy programs can import.

Here's an example of an observing list. This is how I have my mine set up. (Note that this is not the complete observing list - there were many more objects in this particular list.)

After you've finished your observing session with your telescope that night, you can then go into the database to mark the objects you observed as being observed, or as objects you'd like to observe again (for example because observing conditions that night weren't very good, or the object was too low in the sky) .

Now you may be asking yourself why don't I make Observe! into a new, modern application? Or even make it into an app for mobile devices? If it were written in a more modern programming language then that might be feasible, but considering that I'd have to re-write more than ten thousand lines of code in a modern language, and *then* put a new user interface around it, well, I just don't have enough spare time to do all that. I spend enough time sitting in front of a computer as it is. I'd rather use some of that spare time out under the stars looking through an eyepiece. So it will just have to stay as it is.

Appearances aside, the features in Observe! are the result of my needs as a deep sky observer. So if you are a deep sky observer too then you'll probably find the features just as useful. Some of you already have an older version of Observe! You'll be happy to know that you just have to drop my new version on top of your old one and it will automatically update all your data to the new formats without losing anything. And many features are much easier to use now. For example, you now set up your observing sites and output settings directly from the program – you no longer have to hand-edit a separate text file. So you might be interested in the new version too.

The bottom line is that Observe! is an easy-to-use tool to help you plan your observing sessions. And it won't cost you a dime. If you think you might like to give it a try then just let me know, I can send you a copy of the new version. Then you can go Observe!-ing too!

Jupiter's "Now You See It, Now You Don't"

# Mystery of the Missing Moons

by Mike Radwick

I believe my 7th grade English teacher taught that the worst possible way to open any story is with the phrase "It was a dark and stormy night". The phrase is so oft used that Wikipedia has a page dedicated to it (see http://en.wikipedia.org/wiki/It_was_a_dark_and_stormy_night). Yet the phrase conjures an image all astronomers can relate to: something to avoid when camping under the stars. Fanatical readers may also imagine the start of some (usually bad) mystery.

I'll start my (bad) mystery with the phase "It was a clear and steady night". Actually, this describes the conditions pretty well, but it was cold too (about 30F and dropping like a lead balloon).

John Causland and I took advantage of a very nice evening on March 3rd. Although we nearly always send an email to the "Any Clear Night Observers" (ACNO) list inviting everyone to join us, on this occasion we did not and thus it was just John and I observing at his home. As I was setting up, John observed that he had been playing with Sky-Safari (planetarium software for devices based on Android and iOS) and discovered that Europa would emerge from behind Jupiter just as Io went behind Jupiter. Then he told me I arrived too late to observe the event.

This is what I thought I'd missed:
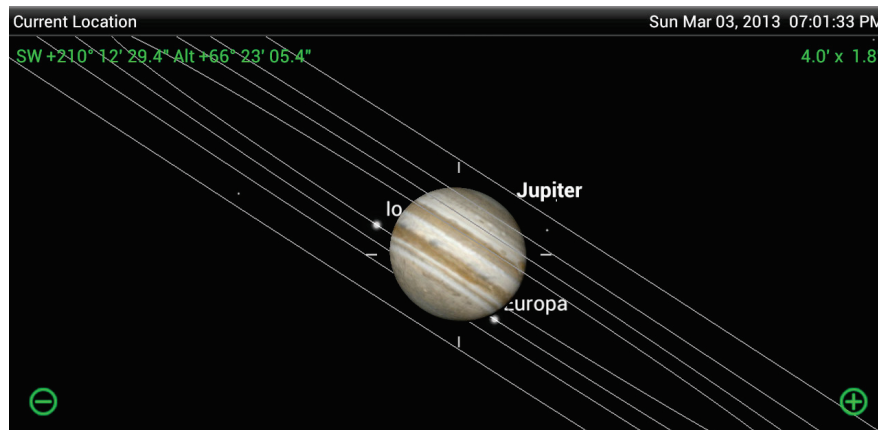
Still, Jupiter is wonderful to look at at any time, and is plenty bright enough to see detail even when my eyes are not dark adapted. So even though I had missed both egress of Europa and ingress of Io, I took a look.

Much to my surprise, Both Io and Europa were missing from the field of view. Now Io was no big surprise; if Sky-Safari was correct, then Io was already behind Jupiter and could not be seen. But where was Europa?! John and I both looked several times and could not see it. I think we exchanged quips about something to do with the Black Monolith created by Arthur C. Clark's aliens in "2001: A Space Odyssey" and "2010: Odyssey Two". By this point we had been joined by Debbie Smith, but she could not explain what was going on either. At first I thought maybe the clock in the phone was off, our position on Earth set incorrectly, or maybe even Sky-Safari had miscalculated the moon positions. I quickly dismissed an error in Sky-Safari; I've used that program many times and the view on the display has always matched the view in the eyepiece. Heck, it even positions the Great Red Spot correctly in real-time!

So we moved on to other targets, yet I still pondered what could be going on.

A short time later, we went inside to warm-up. Still wondering about the problem, I started simulating the event myself using Sky-Safari. At one point I accidentally left Sky-Safari stepping fast-forward in time, and noticed that at some instant Europa was suddenly rendered **much** brighter then earlier. Going back and forth I found that the phenomenon was repeatable. Wondering what happened, I adjusted the time controls to find the exact instant the display changed:
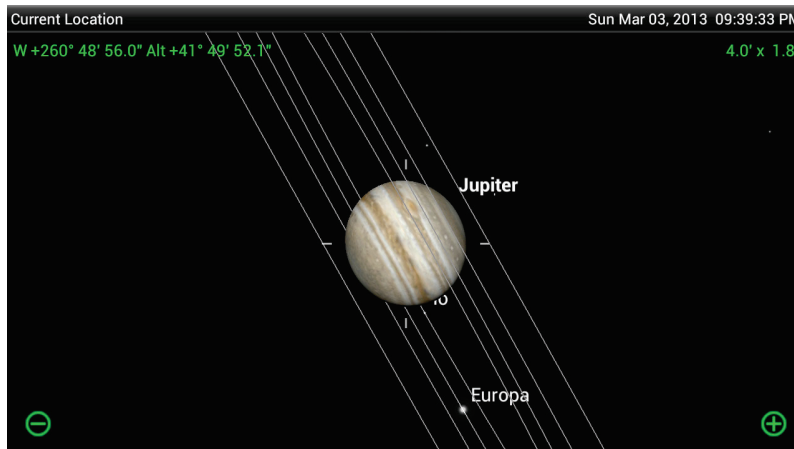
See how Io is just emerging from the disk of Jupiter? It is very small compared to Europa, yet only a minute earlier Europa was rendered the same small size. Inspiration hit and I finally realized what should have been obvious.

Even though Europa was in our line of sight, it was still in Jupiter's shadow. With no light falling on the moon, we could not see it. Sky-Safari rendered the situation by showing the moon very small when in Jupiter's shadow. Here's an image projected from a point above Jupiter:
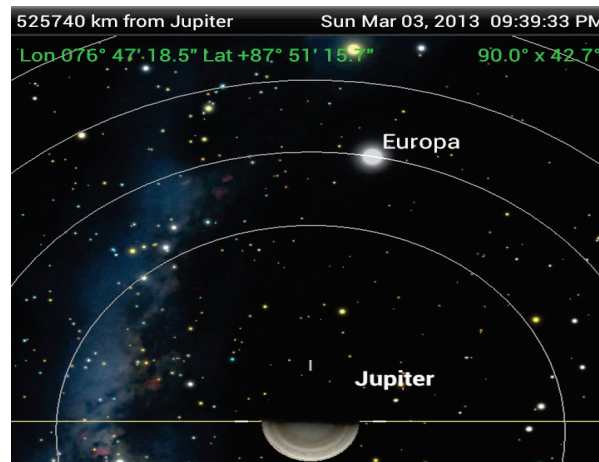
Notice how Jupiter is illuminated in this projection. Although not displayed, the shadow extends as a huge cone (on the order of 55 miles long) up towards Europa. Europa, being less than 0.417 million miles away from Jupiter and well inside the length of the shadow, is regularly eclipsed. Clearly Europa was still in the cone of darkness cast by Jupiter when we first tried to observe it. The inner circle represents the orbit of Io, yet Io itself is not rendered because it is still in Jupiter's shadow. However, Sky-Safari shows Io in the line-of-sight view, but as a much smaller "dimmer" object. Although the representation is misleading at first, it makes sense and is really useful now that I'm aware of it.

John started fiddling around with his copy of Sky-Safari the instant I told him of my realization. A moment later he notice the time, 9:35pm.

We had only four minutes to go outside and point our 'scopes at Jupiter to see if the missing moon would appear as predicted by Sky-Safari. Can you imagine how fast John, Debbie, and I moved?

John and I got our scopes pointed at Jupiter (which was now behind the top of trees, but since it is still winter there were no leaves to really distort the view). We found that only two moons could be seen. So we waited. Tick Tick Tick...

At last John exclaimed that he could see it in his 24 inch scope. A couple of seconds later I saw it appear in my 14" scope, very faint but getting brighter with every second. We looked at our watches, and yes, it was 9:39pm, just as Sky-Safari predicted! What a wonderful feeling to watch this celestial dance in real-time. Amazing! Europa reached full brightness two or three minutes later. Why? Well I figure that when we first saw it, only a part of Europa's surface was illuminated by the sun. Europa is about 1940 miles across, so it does not enter full sunlight all at once. It may be that we first saw it when it was technically still in Jupiter's shadow, with sunlight bent around and filtered though Jupiter's upper atmosphere. An admittedly crude calculation using the mean diameter and mean orbital speed suggests Europa should take about 3 minutes, 47 seconds to fully emerge (not accounting for variables such as the curve of Europa's orbit, Jupiter's motion, Earth's orbital motion and rotation, or General Relativity).

But the story doesn't quite end here. Remember that Io had yet to make an appearance. But none of us were thinking that far ahead, so we didn't think to set any alarm. Some time later we went back inside to warm up again. Once again we were playing with Sky-Safari when John noticed Io would emerge from the shadow at 10:49pm. What time was it?? 10:43pm. Whew, we had a whole six minutes to get outside this time.

Another rushed trip back downstairs and outside. Quick! Point the scopes at Jupiter. Yep, there it is, only 3 moons visible. Keep watching. Shouting at each other "Can you see it yet?" Finally: "There it is, 10:49pm, right on time!" Again, very faint at first, but quickly getting brighter. John, Debbie, and I took turns looking through our two scopes, but we did not think to keep time, so we can't say if Io reach full brightness in more or less time than Europa did. Even though Io is slightly larger (2263mi) than Europa (1940mi), the time to emerge should have taken less time as Io's orbital period is much smaller than Europa's, hence it is moving faster and will come out of the shadow in less time. Roughly speaking, Io should take about 3 minutes, 30 seconds to emerge.

Imagine being able to observe this twice in one evening, both cases more or less by accident. We were too excited to pay much attention to time. Maybe next time we can plan a little better; but then again, maybe not. It was just plain fun to watch.

What a wonderful tool Sky-Safari is; it predicted both events precisely. All of the images shown above were produced by Sky-Safari. I cannot say enough good things about this tool and it's capabilities. I don't work for them, but I would not hesitate to recommend this program to anyone of any experience. If you want to know more, track John or I down and ask, or visit the Southern-Stars website at http://www.southernstars.com/

A Note about Submissions

*It has been the policy of the newsletter for many years to: 1)Publish original Lowbrow (and guest) material and 2)Not set the quality of content bar so high as to severely limit the material submitted. The caveats are: 1)Expect editing to correct text to standard english. 2)Expect image editing to obtain a printable result. Your editor will do all possible to be sure your intelligence is not compromised by common usage errors and that your images will appear to best advantage as PDF images on the web. So there are no excuses: **SEND ARTICLES!**--ed. (SPECIAL NOTE: Astro Photos needed!!!)*

Are the Wheels Coming Off?

Observatory Building Update

by Jack Brisbin

On April 5th I and Kurt Hillig went to the Peach Mountain Observatory. I went there to return the 8' f/7 Cave Dobsonian and assist Kurt in performing lubrication maintenance on the McMath Mount and Observatory Roof wheel bearings. What we noticed was the Observatory Roof hits the wall and drags against the roof as it rolls back. This damages the aluminum roof overhang and cinder block.

Observatory Roof Hitting the Observatory Wall

Not hitting wall other side

The wheel is that far off the rail track

This side of the roof wheels need to be re aligned

The bottom two pictures on the previous page shows how far the roof wheel alignment is off. This is not a photo exaggeration; the wheel is that far off the edge of the rail. This is something we need to fix and discuss how we do it. Some of the members at the April meeting remembered re-aligning the observatory roof to the correct wheel locations on the roof rail. The correct wheel spacing has to be done for all four wheels.

We need to set up a repair schedule and tackle some of these problems. Kurt had some ideas on how to align the observatory roof. The photo on the left is the front corner by the entrance door to the Observatory. It is obvious we need to do some cement work on the building. It will be very important to get AOSS opinion on this work and their support.

I will be available to help with work on the observatory walls and the roof wheel alignment. The roof wheel alignment is more complex to solve when you consider the weight of the roof and wheel axle assembly weight. But I was also told a sledge hammer works.

☆☆☆

Editor's Note on the May Club Meeting--The next club meeting will make decisions on repairing the oberva-tory and obtaining a telescope structure for the refigured 17.5 inch mirror. The observatory will require some work and a little money. The work party will likely take place in late May or June. The scope structure will require anywhere from some to a lot of work, but definitely a lot of money. As much as $3000-$3500 for a telescope with digital setting circles could be needed. There has been heavy email traffic on this subject in an attempt to answer as many questions and have as much discussion as possible before the meeting. A spread sheet has been created comparing two options: As-sembling a TeleKit and purchasing a Hubble UltraLite Structure. You may see information on the Dob Stuff kit as well in the next two weeks. Please inform youself and attend the May 17 meeting.--JF

☆☆☆

Lowbrow Calendar--May 2013

Saturday, May 4, 2013. Westland Library. Astronomy presentation to young people. 1:00-2:30 PM

Saturday, May 4, 2013. (Sunset). (May be cancelled if it's cloudy or too cold). Open House at Peach Mountain Observtory.

Saturday, May 11, 2013. (Sunset). (May be cancelled if it's cloudy or too cold). Open House at Peach Mountain Observtory.

Tuesday, May 14, 2013.(8:00 PM)Camp Hazelwood. Annual excursion to the Hazel Park Schools out-door Science Camp to show fifth grade students the night sky.

Friday, May 17, 2013. (7:30PM). Monthly Club Meeting.

Thursday, May 23, 2013. (6:00pm). The Hubble or There and Back Again: An Astronomer's Tale With special guest: Rajib Ganguly (Q&A afterward). *Longway Planetarium, Flint*

Places & Times

Dennison Hall, also known as The University of Michigan's Physics & Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. Dennison Hall can be found on Church Street about one block north of South University Avenue in Ann Arbor, MI. The meetings are usually held in room 130, and on the 3rd Friday of each month at 7:30 pm. During the summer months and when weather permits, a club observing session at the Peach Mountain Observatory will follow the meeting.

Peach Mountain Observatory is the home of the University of Michigan's 25 meter radio telescope as well as the University's McMath 24" telescope which is maintained and operated by the Lowbrows. The observatory is located northwest of Dexter, MI; the entrance is on North Territorial Rd. 1.1 miles west of Dexter-Pinckney Rd. A small maize & blue sign on the north side of the road marks the gate. Follow the gravel road to the top of the hill and a parking area near the radio telescopes, then walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.
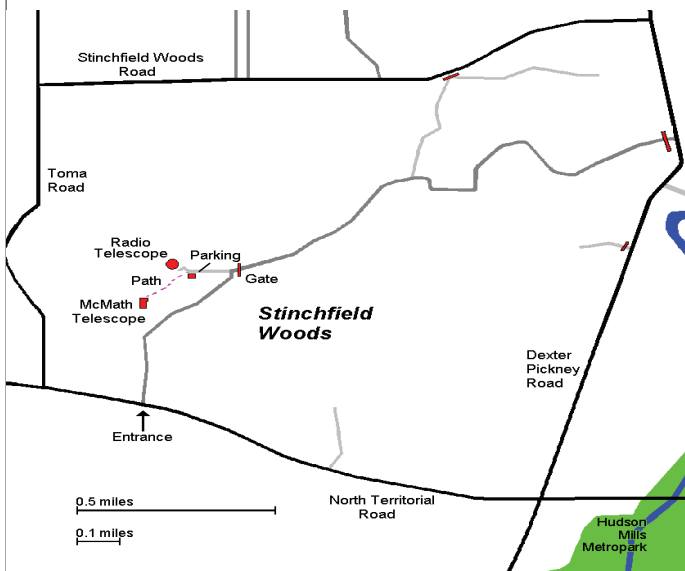
Public Open House / Star Parties

Public Open Houses / Star Parties are generally held on the Saturdays before and after the New Moon at the Peach Mountain observatory, but are usually cancelled if the sky is cloudy at sunset or the temperature is below 10 degrees F. For the most up to date info on the Open House / Star Party status call: (734)332-9132. Many members bring their telescope to share with the public and visitors are welcome to do the same. Peach Mountain is home to millions of hungry mosquitoes, so apply bug repellent, and it can get rather cold at night, please dress accordingly.

Membership

Membership dues in the University Lowbrow Astronomers are $20 per year for individuals or families, $12 per year for students and seniors (age 55+) and $5 if you live outside of the Lower Peninsula of Michigan.

This entitles you to the access to our monthly Newsletters on-line at our website and use of the 24" McMath telescope (after some training).

A hard copy of the Newsletter can be obtained with an additional $12 annual fee to cover printing and postage. Dues can be paid at the monthly meetings or by check made out to University Lowbrow Astronomers and mailed to:

The University Lowbrow Astronomers

P.O. 131446

Ann Arbor, MI 48113

Membership in the Lowbrows can also get you a discount on these magazine subscriptions:

Sky & Telescope - $32.95 / year $62.95/2 years

Astronomy - $34.00 / year or $60.00 for 2 years

For more information contact the club Treasurer at:

lowbrowdoug@gmail.com

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest.

Call or Email the Newsletter Editor: **Jim Forrester (734) 663-1638 or jim_forrester@hotmail.com** to discuss length and format. Announcements, articles and images are due by the 1st day of the month as publication is the 7th.

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Lowbrow's Home Page

http://www.umich.edu/~lowbrows/

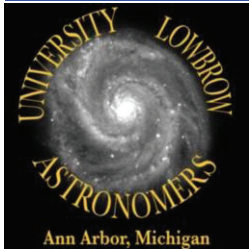## Email at:

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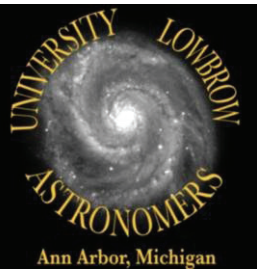
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Reflections & Refractions

Website

www.umich.edu/~lowbrows/

M31

4/4/2013
9:54:47
PM

C 2011 L4
PANSTARR

Ken Ruble sends us this wide field shot of comet C/2011 L4 PanSTARRS
Original jpg mage contrast enhanced by the editor in PhotoShop

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