



Mingo Creek Park
Observatory

The Guide Star

Newsletter of the Amateur Astronomers Association of Pittsburgh, Inc.

Founded June 9, 1929 by Chester B. Roe and Leo J. Scanlon

Website: 3ap.org



Nicholas E. Wagman
Observatory

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TOPIC OF SEPTEMBER'S MEETING: "THE MURDER? OF TYCHO BRAHE"



On September 12, 7:30, at the Carnegie Science Center we're off to an intriguing start as Terry Trees presents "The Murder? of Tycho Brahe".

Man has always been curious about the heavens as evidenced by the meticulously kept records of the ancient Persians and the complex theories of planetary motion developed by

the ancient Greeks. However, it wasn't until the early 1600s that our current understanding of the planets'

elliptical motions around the Sun arose, after Nicholas Copernicus published his solar-centric planetary system and Johannes Kepler's three Laws of Planetary Motion were developed using Tycho Brahe's extremely accurate data. The new system was much simpler and its predictions were more accurate than those of the ancient Greek system.

Kepler was an assistant of Tycho's for a number of years. But how did Kepler obtain that data when Tycho willed it to his heirs? And is there any credence to the many rumors that then circulated through Europe that the famous and popular astronomer, Tycho, had been poisoned? If he was poisoned, was Kepler the culprit?

Terry investigates the dark secrets of our astronomical founding fathers . . .

I hope to see everyone there! I especially encourage new members to come out and see what we're all about. There will be an opportunity for further socializing after the meeting at Max's Allegheny Tavern.

Terry earned his Ph.D. at the University of Pittsburgh, his M.Ed at Slippery Rock State University and his B.S. at Case Western Reserve University, where his studies emphasized the History of Science. He is a former Adjunct Professor of Astronomy and Physical Sciences for Waynesburg University.

Terry is a former AAAP President, Vice President, Corresponding Secretary and for many years was Chair or Co-Chair of the Laurel Highlands Star Cruise, a large annual star party the AAAP used to hold on the PA/WV border. He is a frequent guest speaker at astronomical gatherings, including Astroblast, Star Cruise, the Christmas banquets of the Allegheny Highlands Astronomical Society, and just a few months ago, Star Gazing Manitoulin, held on a large Canadian island in Lake Huron. He attends camp-over star parties in Ohio, Pennsylvania, Ontario, and Texas to partake of the riches offered by truly dark skies.

Last summer, Terry organized a field trip for the AAAP to the Posner Library of CMU, where a number of us were privileged to be able to view (and in some cases even touch) original printings of the works of Johannes Kepler and Tycho Brahe (the subject of his September 12th talk), as well as works by Galileo, Isaac Newton, and others.

STELLAFANE AMATEUR TELESCOPE CONVENTION

By Al Paslow

I attended the 2008 Stellafane Amateur Telescope Convention in Springfield, Vermont this year in early August. The 600 plus mile trip was certainly a long one and added to it the expense of gas; but it certainly was an enjoyable experience.

The first thing that came to my mind driving in the isolated portions of New York State and virtually anywhere in Vermont were the dark night skies. The state of Vermont especially has restrictions on outdoor advertising and, therefore, lighting. In addition, an overall absence of street lights in a tremendous portion of rural areas and perhaps also minimal electric service (due to heavy snowfalls) makes the area an astronomers' paradise. The dark skies kind of reminded me of the way it was back home in the late 60's and early 70's --- but better!

Stellafane is an unusual place. To begin with, it is really the center of amateur telescope making in this country. Russell Porter, the designer of the 200-inch telescope at Palomar Observatory, is credited with much of the growth of this hobby and it is on Porter's fifteen acres of land.

Over the years, additional tracts of land have been purchased. The terrain is hilly and on high ground. This is the reason that not all of the complex is together. For example, the famous "pink clubhouse" is located on the original Porter tract along with the 15-inch Porter Turret telescope. Many observe here but space becomes precious fast. A quarter mile walk down a dusty road will bring you to the newer tracts of land. This is where most visitors camp and setup. In this more recently acquired tract, we have the McGregor 13-inch Schupmann telescope, Flanders Pavilion—demonstrations of mirror grinding/polishing—and the general tee-shirt and souvenir areas. I am told there is a third tract somewhere in all of this and that might just be where the Stellafane swap meet is—just another jaunt down another dirt country road.

Overall, the place has a different feel to it then other amateur events. In many cases, Stellafane is just as much about observing as telescope building. Many do not realize this. Sure, the judging of homemade telescopes is part of this gathering, but looking into these fine instruments is what wins the awards for best optics. I can only equate it this way—what good would a baking contest be unless somebody sampled the goods!

Commercial telescopes or vendors are really not permitted and it's this kind of "flavor" that sets Stellafane apart from say The Texas Star Party and other national events. I arrived Thursday evening with beautiful, intensely transparent skies. I could see stars down to almost the horizon. All stars were visible, for example, in the constellation outlines of Lyrae, Scorpius, Ophiuchus, to name a few. The Milky Way was strongly mottled and hints of M-33 were naked eye. The opportunities of looking through telescopes were outrageous, as they were all around!

Here are some images:

Little Pink House:

http://al-paslow.smugmug.com/photos/345642491_3uZkY-XL.jpg

Porter Telescope:

http://al-paslow.smugmug.com/photos/345642533_38LVN-XL.jpg

10-inch Ritchey Chretien f-30 Telescope—beautiful

http://al-paslow.smugmug.com/photos/345639076_4nzVU-XL.jpg

10-inch RC—close-up with Springfield mount—beautiful brass work!!

http://al-paslow.smugmug.com/photos/345639049_wdp33-XL.jpg

Gorgeous—5-inch Alvin Clark Refractor

http://al-paslow.smugmug.com/photos/345638806_oLwKp-X2.jpg



Alvin Clark & me

http://al-paslow.smugmug.com/photos/345638895_8UdJs-XL.jpg

13-inch Schupmann Telescope

http://al-paslow.smugmug.com/photos/345637938_DopVF-XL.jpg

16-inch Homemade Cassegrain

http://al-paslow.smugmug.com/photos/345638422_toJzj-X2.jpg

Beautiful Wooden Dob!!

http://al-paslow.smugmug.com/photos/345638530_nNuRh-XL.jpg

Grinding a 27-inch Telescope mirror

http://al-paslow.smugmug.com/photos/345639213_XnkbX-XL.jpg

Foucault Tester and Null setup

http://al-paslow.smugmug.com/photos/345637705_gGfgC-X2.jpg

Mirror Grinding Benches

http://al-paslow.smugmug.com/photos/345637738_6povv-XL.jpg

Observatory with 10-inch telescope

http://al-paslow.smugmug.com/photos/345638001_eMccx-X2.jpg

I met people from beginners to very advanced amateurs. People come from near and far. A couple from Canada has come every year since 1970. The gentleman who brought the Alvin Clark instrument traveled from New Mexico. When you consider the lectures of mirror grinding, polishing, and testing, demonstrations, and dark sky observing, it is well worth the admission fee of \$20 per person!

In conclusion, this has been a great trip and I'm marking my

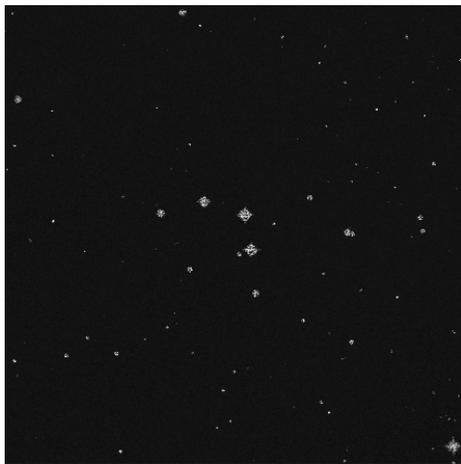
calendar for next August. For those who are looking for something more than just observing and would like to learn about building and testing your own instrument, this is the best event of the year.

More images of Stellafane at:

http://al-paslow.smugmug.com/gallery/5625552_bWxr9/1/345637575_iHFpr

REILAND'S ASTERISM

By Dana Patchick



Tom is credited for finding an apparently unknown asterism that he chanced upon while observing through the 21-inch reflector at Wagman Observatory the evening of August 3rd.

While searching for NGC 5616 in Bootes, around 11:34 PM and using a magnification of

115x, he noticed an arc of five stars in the same field with the galaxy. The asterism was located about 22' southwest of the galaxy at about 14 22 48 +36 15 00 (J2000).

His description is as follows: "The three middle stars are close to the same brightness. The star to the NE is slightly fainter and the one to the south or SW is the faintest star. It forms a slightly flattened arc (of around 4 1/2' in size)".

When I got back to Tom and told him I thought it was unreported, he expressed his surprise that no one had observed it.

It shows up pretty simply on 'Guide' - five stars between magnitudes ~9.7 and 12.3. Didn't seem to be such a big deal, but Tom was clearly moved by the grouping. I wanted to check it out myself before bringing it to the attention of the group.

Well, tonight I got my chance even with the first-quarter Moon out there. At about 10 PM local time, I got my 13.1" aimed at it with my 75x eyepiece in place. What a charming sight indeed! You just can't go by mere software or photos to give you a real indication of what it is going to look like.

I just want to back Tom up on this—it is a pleasing sight and worth making a note of.

I like to use the Sky & Telescope, 'Pocket Sky Atlas', and have to say it was real easy to find Tom's latest by going to chart 42, finding NGC 5557 plotted on it and noting the lone 7th magnitude star some 1/2 degree to the east. Continue heading this direction about the same amount and you can't miss the asterism in any sort of amateur sized telescope. I

had a ZLM of about 4.5 tonight, with all of the Little Dipper stars faintly visible to the north. Not a bad night, all in all. Perfect for spotting the little asterism!

This would become 'Reiland 4' if it meets with the Deep sky hunter's approval.

2008 AAAP PHOTO CONTEST

By Dave Conte

The 2008 photo contest will be held, as always, at the November meeting. I understand that the tentative date is the 14th. Deadline for entries would be 10 days prior: November 4th. Only images taken since last year's deadline of November 6, 2007 are eligible. More information to follow in the October newsletter.

RENEWAL FORMS

By Mike Meteney

All AAAP members whose memberships expire 12/31/08 will receive a renewal form in the mail towards the end of September. This renewal form will also be printed in the October, November, and December issues of the Guide Star. It is important to renew your membership by the end of the calendar year. Anyone who also is renewing a subscription to *Astronomy Magazine* should renew their membership as early as possible to avoid a lapse in their subscription. There is a three-month lead time on magazine subscriptions. Please read and follow the complete instructions that will accompany your membership renewal form. **There will only be one mailing due to the high cost of postage.**

DATES OF 2008-2009 MEMBERSHIP MEETINGS

Sept	12th
Oct	10th
Nov	14th
Dec	12th
Jan	9th
Feb	13th
Mar	13th
Apr	10th
May	8th

OBSERVATIONS

Sherry O'Neill: Posted to the listserver August 15, 2008. I dragged my scope out into the driveway just as it was getting dark. To jump forward a few hours, I noted at one point that the sky didn't look quite as dark or the stars as bright. It was then that I realized that it was getting daylight! I was shocked to look at my watch and see that it was going on 5:30 AM. My night started off seven hours or so earlier with the Moon. I read in *Astronomy Magazine* a few months back about a feature on the Moon created by the way sunlight is hitting the crater Werner. It's similar to the "Golden Handle", but this is an X. According to my calculations, it should have been visible on Friday evening before midnight. I either was looking at the wrong place, not enough magnification, or else my calculations were wrong and I was looking at the wrong time. But at any rate, I couldn't see it. I decided to work on my Messier list since I was having a rare conjunction of a night when I was actually home, plus dark and clear skies. I started off with M5. I found it fairly easily in spite of the fact that it was in the general direction of the lights of Pittsburgh. I guess it was far enough away to see it OK. It resembled a fairly good-sized puffball. I was actually surprised it was as big as it is. I thought I'd better look at Scorpius then because it was getting lower by the minute. The Moon nearby didn't seem to affect viewing too much. Considering the light pollution I have to deal with from my house, the Moon didn't make things any worse. I could just barely see M4. By the time I had made a positive ID on it, and then tried to find M80, M80 was getting too close to the rooftops. So, it had to be put on hold for another time. I had similar luck with the Ophiuchus objects. I decided they would all be good Wagman targets since I don't have to deal with houses obstructing the view from there. My next target was M92. It was kind of difficult to find only because it was so high up in the sky, and I'm not particularly limber. But I managed to find it by starhopping from M13. It was smaller and dimmer than M13, but still relatively easy to find and definitely a pretty sight. My celestial tour then moved down to Sagittarius. After enjoying Jupiter for a few minutes, I started picking out the Messier objects. I started off with M22, always an easy one for me to find. Then starhopped over to M28. Much smaller and dimmer than I expected, but still easy to find. By now, the sky was really dark and it was awesome just scanning the star fields in Sagittarius picking out all the objects. Most of them I had already "bagged", so it was just the aesthetic value of enjoying them. My next target was M26. I found it by starhopping from M11. I had some difficulty finding it. But once I got into the correct star field, I was able to finally locate it. Next, I moved onto M27 and M74. Both were challenging due to the sheer number of stars. Finding the right star to hop from, that is. My final target of the night was my old nemesis...M76. My problems with it a few months back were that it was in the direction of all the lights near me. Then there was the fact that it was so high up, and again, I'm not too limber. It's perfectly placed in the morning sky this time of the year. I would like to say that I found it with no trouble, but I did have to look for it for awhile. Again, it was trying to figure out whether I was hopping from the correct star or not. But I did finally see it. It was about now that I realized that it was starting to get light. I honestly was shocked to see that I had completely lost track of time. And

that I had been outside observing for over seven hours. Before going in, I walked across the street to see Orion rising in the east. I have seen him as early as July 25th. Usually that's my annual birthday tradition on the morning of the 28th. But this year the weather and time constraints pushed it back a few days. My next big project of August is the first rising of Sirius. I have seen it as early as August 12th, but it is usually more like the 20th by the time it clears the haze in the east. Oh yes, I saw Venus for the first time this year on Monday the 11th. Later on that evening, I got some gorgeous photos of The Golden Handle.

Fred Klein: Posted to the listserver August 16, 2008. Well, the bird-in-the-hand approach really worked out well last night. That is, take the first opportunity that presents itself, rather than waiting for what might be a better chance in the future. The NWS forecast wasn't very good (seems they are always on the gloomy side) and even CSC was iffy. But the satellite pics showed broken clouds and my own observations showed only fluffy sun clouds so I decided to give it a try. I set up my 11-inch SCT at my regular site on the South Side at 19th and E. Carson. At 8:24, I had Jupiter on exhibit and was getting a steady stream of "customers". Just at that time, the last clouds of the evening were dissipating and the sky was clear and the air steady. Jupiter was very clear with the cloud bands showing lots of detail. I was at 125 power using a Televue 22mm Panoptic. In fact, when it got darker, just about the time Io came off the face of Jupiter (I hadn't looked to see if I could make it out because it was on one of the white parts) I spotted the shadow of Io on that same white part. I pointed out the shadow to several interested viewers and they could all see it. About 10, Jupiter went into the overhead obstructions and I switched to the nearly full Moon using a 40mm eyepiece for 70x and added polarizing filters to reduce the brightness. (Have I ever said I really love the look of the full Moon?). I gave out 336 views from 8:24 to 11:10, my highest total yet. No club members (except for one who I had not heard of but said he was inactive) stopped by—I gave him a passout). But, I did not feel lonely. A number of people said they had seen me before, a few I recognized and a couple now seem like friends. Each of the bartenders from Pipers Pub, a couple doors up, came out one-at-a-time as they passed the word. Other people came out as word was passed around. Two young girls brought two others from several blocks up the street. As always, about half of the people passing by stopped for a look. A number of times people who were on the fence changed their minds when hearing exclamations from people viewing. Other times, people who had just viewed cajoled hesitant passersby to stop. I got the usual comments. There were a lot of remarks on the "Rings"; only one person did not accept my remark that they are cloud bands. Lots of people asked if the stars were moons. Several were stunned to hear that there are 63 moons (last time I checked). One guy kept trying to get me to tell him what part of the Moon we could see (it was full moon - you could see all of the side facing us, he just didn't get it that you could only see one side and we were seeing all of it). I gave out about a dozen club flyers. Several people mentioned having attended star parties. Several were surprised to hear about the site at Mingo. It was a wonderful night.

Jim Klueber: Posted to the listserver August 12, 2008. I took the day off of work today so that I could stay up last night and watch the Perseids with my two oldest kids, Zachary (13) and Anna (10). We pitched a couple of tents on top of our hill and started observing the Moon around 8:00 in the evening. Sinus Iridium (the Bay of Rainbows) was perfectly positioned last night and offered some spectacular views and details along its rim. We continued to watch the Moon until Jupiter came into view. All four Galilean moons were in view and we watched Ganymede approach Jupiter for a transit later in the evening. Despite its low southerly position, we could still make out considerable detail in its cloud bands through patient observing. The first Perseid we spotted came at 8:48 PM and was a brilliant one that started just above the NNE horizon and rose to maybe 45 degrees. My kids saw several more while my eyes happened to be looking through my telescope including one that ran parallel to the horizon about 30 degrees up from E to SSE that my son claims was the best one he ever saw. After checking out a few other objects through my scope and binoculars, we decided to turn in for a little while since the Moon was out and get up when it was dark. I got back up around 2:15 AM and woke the kids at 2:30. From 2:30 until 3:15, I counted 20 Perseids and 4 sporadics. I was facing mainly NE towards Perseus in a lounge chair. Zachary was lying flat on the ground and in the same orientation and Anna was sitting in a chair facing more to the north. They didn't keep count during this time, but I'd guess that Zachary saw around 20 and Anna around 15. We probably had about a 75% overlap in seeing the same meteors. Shortly before 3:00, some clouds started moving in and by 3:15 we were nearly completely overcast. We decided to turn in again for a while to see if they would clear. I woke up twice more before dawn, but each time I looked out it was mostly cloudy. So we didn't catch anymore after that time. The temperature was a little cool, but we were dressed for it and were comfortable. There was a constant light breeze while we were out and we had no dew to speak of the entire time we were out watching. When we woke in the morning, the clouds/fog had set in and everything was pretty wet. It was nice and quiet too the whole night with nothing other than the cicadas and crickets to serenade us. We didn't get to observe as much as we would have liked, but all and all, a pleasant family night out.

Mike Fisher: Posted to the listserver August 12, 2008. I arrived at Mingo at 8:00 PM Monday evening. The skies were mostly clear except for a distant cloud bank way in the south. I set up my CPC, two car batteries in tow now on the ground under the scope; one battery to power the scope and the other to power anti-dew strips (the dew strips worked perfectly later in the night when the dew-monster arrived with a vengeance). A group of three young people showed up around 8:45, two guys and a girl, late teens, early twenties maybe. They said a member they know told them that there would be members at Mingo for the Perseids and they should stop in to see the grounds and observatory. They were delightful, well-mannered youngsters and I had no problem with them coming. The young lady came very unprepared wearing just shorts and a tee-shirt. Michael S. and a friend of his showed up around 9:30.

Mike opened up the building and gave the kids a tour. They later said it was the most awesome thing they have ever seen. Later, Kathy D. and a couple of her friends showed up and finally Gene K. and his friend arrived. This was the observing crew and all who came. From 8:00 PM Monday evening to 6:30 AM Tuesday morning, I personally saw exactly 55 meteors. Given the call out of "there's one" while I was looking through the telescope, I would estimate another 20. So that was about 75 meteors over 9 hours. They were all fast, brief little flasher meteors. We saw a few with short smoke trails, a few wobblers (where they look like they are spinning and throwing their debris outward?) and some greenish colored ones. Me, Kathy, Gene, and his friend left Mingo around 6:30 AM Tuesday morning. Vega, Deneb, Deneb Kaitos (in Cetus) Orion and a few other bright stars were still shining in the early morning sky. It was beautiful.

James Schultheis: Posted to the listserver August 4, 2008. After getting back from a pretty much botched observing trip at CSSP, Sue and I set up the 12.5" f/5, 80mm f/5 Acromat and the 15" f/4.5 in the driveway last night with clear skies, good transparency and fair seeing. Temperatures were in the 70's. Sue promptly fell asleep in the lawn chair and I pushed on for some DSO (using the 15" f/4.5) with a focus on trying to find (via starhopping) and observe NGC 6765, a very difficult oddball planetary Nebula in Lyra. With detailed finder charts in hand, I did get to the general location using my 24mm Panoptic with about 1-degree AFOV but this thing is tough and I saw nothing. I bumped up the power to 190x using the 9mm Nag. and there within a triangle of stars, I could see a faint smudge sort of like a goldfish shape, for which I put my Bandmate O-III filter on and the Nebula came out very obviously. I am going to officially (on the list) name this planetary Nebula the "Goldfish Nebula". I then experimented with power and filters and did like 190x's using the O-III the best. I then set my sights on Barnard's "E" (B142,143) which has also been called "Fish on a platter" in Aquila. Actually, I did find it with the 15" as some Grey patches, devoid of any stars but I had to use my 80mm Orion f/5 Acromat refractor to see the whole FOV. With its smaller aperture, the "E" was not discernible in Scottsdale's light-polluted skies. I also looked at NGC 6803 as a nearly green stellar PN in Aquila (tough) and a real nice PN NGC 6804 with the 9mm Nag at 190x (easy). NGC 6741, "The Phantom Streak" eluded me. It was a good hour and a half of observing!

COOL WEBSITES

Hubble site:

http://hubblesite.org/newscenter/archive/releases/2008/28/image/a/format_large_web/

Interesting note in this article about a future survey that will measure the "wobbles" of 10,000 stars, caused by the pull of unseen objects, perhaps planets:

http://www.skynightly.com/reports/Giant_Astronomical_Survey_Completes_Its_Mission_999.html

There is a new version of the free planetarium software, Stellarium, available for download, Windows and Mac versions, V 0.9.1 at www.stellarium.org.

Check this web page out. It's apparently a real discovery. Looks like something out of "Ghostbusters":

<http://news.aol.com/article/sky-watcher-spies-gassy-cosmic-ghost/119539?icid=200100397x1207290553x1200380413>

Light pollution article:

<http://online.wsj.com/article/SB121692767218982013.html>

Ten biggest impact craters on earth:

<http://www.environmentalgraffiti.com/sciencetech/10-greatest-major-impact-craters-on-earth/1403>

Moon transits earth:

<http://www.youtube.com/watch?v=VqyAO8u227o>

NASA Science News for July 11, 2008. The Sun is entering its third year of eerie calm. Sunspots are rare and solar flares simply aren't happening. Is this "solar minimum" lasting longer than it should? A NASA scientist has examined centuries of sunspot data to find the answer, revealed in this story from Science@NASA:

http://science.nasa.gov/headlines/y2008/11jul_solarcycleupdate.htm?list778348

Mingo fork mount pictures:

http://al-paslow.smugmug.com/gallery/5370309_WAq52

US House of Representatives passes bill marking International Year of Astronomy:

<http://thomas.loc.gov/cgi-bin/bdquery/z?d110:HConRes375:/>

World's best places to see the stars:

<http://www.msnbc.msn.com/id/25287818/>

Small Solar System Bodies to Be Named "Plutoids":

<http://www.msnbc.msn.com/id/25097567/>

At the Annual Astronomy Exchange in Essen Germany, prototypes for a new small series of Zeiss Abbe Orthoscopic eyepieces were displayed. They will be made by Carl Zeiss in Germany. The new oculars while recognizable as Abbe Orthos will be called "A-II". The design, said to embody improvements by Zeiss, will have an AFOV of 43° and will perform in scopes as fast as f/4. The A-II set includes units in 4,6,10 and 16mm focal lengths and will come in a wooden presentation case engraved with the Zeiss logo. A Barlow will also be available. Sold only as sets, they are priced at 1500 Euros or (currently) about 2300 USD. They should become available in two or three months. For newer folks, the Zeiss Abbe Orthos have an almost legendary reputation for planetary viewing and observing that requires high contrast and excellent definition. They were produced in limited numbers in the late nineties and the going price for an original set is about 4500 USD. The originals are described at:

<http://www.company7.com/zeiss/products/czabbeoclr.html>

Here's a nice little video on a trip to the observatory:

<http://www.youtube.com/watch?v=2vwjc7aruBQ>

Maria-Louise Wagman Stracke, who is Dr. Wagman's daughter living in the Chicago area, alerted us to the following article that appeared May 29 in the Chicago Tribune, The Starry-eyed Visitor. In a scientific love story, the world's top telescope historian fulfills a lifelong dream to see the

world's largest refracting telescope:

<http://www.chicagotribune.com/features/lifestyle/chi-telescope-0529may29.0.6897684.story>

CLUB PHOTOS

Photo of Lagoon and Trifid neighborhood. On Wednesday night, August 20, I used the brief time between twilight and moonrise to try out a new light pollution filter from my driveway in Marshall Township. My target was the area around M8 and M20. I have not modified my camera to eliminate its built-in infrared filter, so it is not very sensitive to the Ha wavelengths of emission nebula. Still, I was pretty happy with the result of this test. Stack of 26 exposures of 30-seconds at f/4.0 and ISO 1600 with Canon 40D and 200mm f/2.8 lens.

<http://www.cs.cmu.edu/~pane/tmp/M8-M20-M21.jpg>



Photo by John Pane

I took some quick shots of the sky just after sunset August 20, 2008. Dazzling! Check them out:

<http://www.exploretheline.com/sunset/>



Photo by Pete Zapadka



Send comments for redesign of AAAP website to Mike Skowron at it@3ap.org

WELCOME NEW MEMBERS

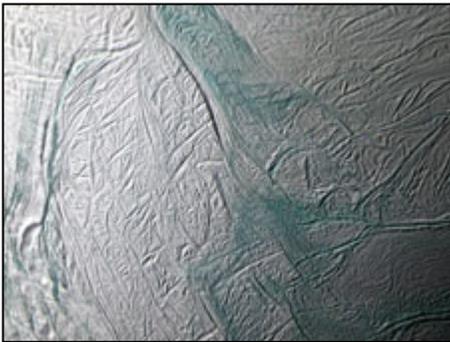
Ken Czambel
Daniel Golembiewski
Foster Kartotis
Andrew Smith
Dr. William Irwin
Dave Walters

GATE COMBINATIONS

Gate combinations are given out by the directors and club treasurer. Please contact them for access to the observatories.

CASSINI PINPOINTS SOURCE OF JETS ON SATURN'S MOON ENCELADUS

(August 14, 2008)



This sweeping mosaic of Saturn's moon, Enceladus, provides broad regional context for the ultra-sharp, close-up views NASA's Cassini spacecraft acquired minutes earlier, during its flyby on August 11, 2008. Image credit: NASA/JPL/Space Science Institute

PASADENA, Calif. -- In a feat of interplanetary sharp shooting, NASA's Cassini spacecraft has pinpointed precisely where the icy jets erupt from the surface of Saturn's geologically active moon, Enceladus.

New, carefully targeted pictures reveal exquisite details in the prominent south polar "tiger stripe" fractures from which the jets emanate. The images show the fractures are about 300 meters (980 feet) deep, with V-shaped inner walls. The outer flanks of some of the fractures show extensive deposits of fine material. Finely fractured terrain littered with blocks of ice tens of meters in size and larger (the size of small houses) surround the fractures.

"This is the mother lode for us," said Carolyn Porco, Cassini imaging team leader at the Space Science Institute, Boulder, Colorado, "A place that may ultimately reveal just exactly what kind of environment -- habitable or not -- we have within this tortured little moon."

One highly anticipated result of this flyby was finding the location within the fractures from which the jets blast icy particles, water vapor and trace organics into space. Scientists are now studying the nature and intensity of this process on Enceladus, and its effects on surrounding terrain. This information, coupled with observations by Cassini's other instruments, may answer the question of whether reservoirs of liquid water exist beneath the surface.

The high-resolution images were acquired during an August 11, 2008, flyby of Enceladus, as Cassini sped past the icy moon at 64,000 kilo-

meters per hour (40,000 miles per hour). A special technique, dubbed "skeet shooting" by the imaging team, was developed to cancel out the high speed of the moon relative to Cassini and obtain the ultra-sharp views.

"Knowing exactly where to point, at just the right time, was critical to this event", said Paul Helfenstein, Cassini imaging team associate at Cornell University, Ithaca, NY, who developed and used the skeet-shoot technique to design the image sequence. "The challenge is equivalent to trying to capture a sharp, unsmear picture of a distant roadside billboard with a telephoto lens out the window of a speeding car."

Helfenstein said that from Cassini's point of view, "Enceladus was streaking across the sky so quickly that the spacecraft had no hope of tracking any feature on its surface. Our best option was to point the spacecraft far ahead of Enceladus, spin the spacecraft and camera as fast as possible in the direction of Enceladus' predicted path, and let Enceladus overtake us at a time when we could match its motion across the sky, snapping images along the way."

For scientists, having the combination of high-resolution snapshots and broader images showing the whole region is critical for understanding what may be powering the activity on Enceladus.

"There appears to have been extensive fallout of icy particles to the ground, along some of the fractures, even in areas that lie between two jet source locations, though any immediate effects of presently active jets are subtle," said Porco.

Imaging scientists suggest that once warm vapor rises from underground to the cold surface through narrow channels, the icy particles may condense and seal off an active vent. New jets may then appear elsewhere along the same fracture.

"For the first time, we are beginning to understand how freshly erupted surface deposits differ from older deposits", said Helfenstein, an icy moons expert. "Over geologic time, the eruptions have clearly moved up and down the lengths of the tiger stripes".

The new images, with jet source locations labeled, are available at: <http://www.nasa.gov/cassini>, <http://saturn.jpl.nasa.gov> and <http://ciclops.org>.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the Cassini-Huygens mission for NASA's Science Mission Directorate, Washington. The Cassini orbiter and its two on-board cameras were designed, developed and assembled at JPL. The imaging team is based at the Space Science Institute, Boulder, Colorado.

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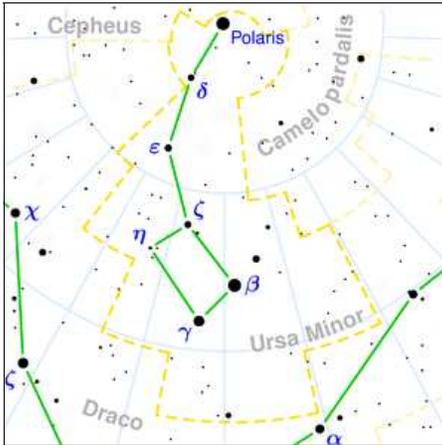
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Space Science Institute,

POLARIS

By Mike Simonsen, [Simostronomy](#)



I've won and lost a lot of money for people in silly bar bets about Polaris. People have the common misconception that Polaris, the North Star, is the brightest star in the sky. It's not; Sirius holds that honor. It's not even in the top 20 brightest stars. It comes in at number 48. That'll be five dollars, thank you.

And as my friends and family all know, if you ask me an astronomy question after a few drinks, you are not going to get a short answer. So here is the rest of the fascinating story of the North Star, Polaris.

Polaris, also named alpha Ursa Minoris, is the brightest star in the Little Dipper. It marks the end of the handle. By a twist of luck, it also happens to reside very close to the North Celestial Pole (NCP). This is the point in the sky that all the stars in the north rotate around. It's not exactly on the NCP; in fact, it's more than a Moon's width away, so it scribes out a very small circle in long exposure star trail images like this one below. To the unaided eye it appears that all the stars rotate around Polaris while it remains fixed in one spot.



This fact has been known since ancient times, and Polaris has been used for navigation for centuries. The Chinese philosopher, Confucius, remarked, "He who exercises government by means of his virtue may be compared to the north polar star, which keeps its place and all the stars turn towards it." Not only does it tell you where north is, its angle above the horizon roughly equals your latitude on Earth.

Through binoculars Polaris looks like the diamond in a small asterism called the 'Engagement Ring'.

Through a small telescope it is easy to see that Polaris is actually a double star, a fact discovered by William Herschel in 1780. This visual companion is known as alpha UMi B.

In 1929, another fainter and much closer companion was detected spectroscopically, but it wasn't until 2006 that we were actually able to image this close dwarf star with the Hubble Space Telescope. This third member of the system is called alpha UMi Ab.

In spite of Shakespeare's Julius Caesar declaring, "I am as constant as the Northern Star, of whose true fixed and resting quality, there is no fellow in the firmament", not only is it not at rest in the firmament, the North Star is not constant in brightness either! Polaris is a variable star, and as it turns out, a rather interesting, unique variable star.

Polaris is a Cepheid variable. These are stars that pulsate with periods of a few days. The expansion and contraction of the outer atmosphere leads to changes in brightness. These stars are typically yellow giants or super-giants. They are huge stars, 40-

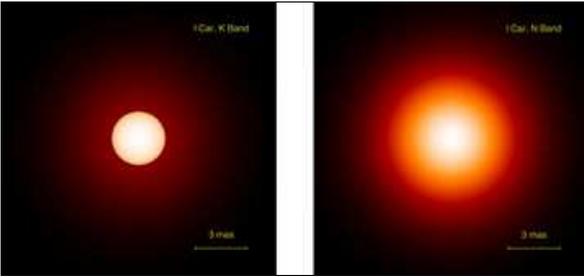
180 times the radius of our Sun and much more massive. Polaris is six times as massive as our Sun and its radius is 45 times that of the Sun. Polaris is the closest of these stars, at a distance of 431 light years.

Cepheids have the unique characteristic that the period of the star, the time it takes to go from maximum light to minimum and back again, is directly proportional to the absolute magnitude (brightness) of the star. If we know the period and how bright the star 'appears' from earth, we can determine with a great deal of accuracy how far away the star is. In this way Cepheids have been used as benchmarks, or 'standard candles' to measure distances. Since these stars tend to be huge and bright, we can even see them in galaxies outside the Milky Way.

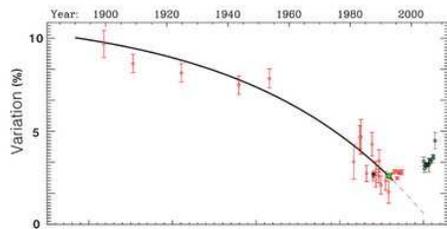
Since Cepheids are used to measure the distance to galaxies and the expansion rate of the universe, it is essential to understand their physics and evolution. Being able to image and study the exact motion of Polaris and alpha UMi Ab is a boon for astronomers who want to determine the mass of Polaris accurately. Analyzing the orbits of double stars is one of the most effective ways astronomers have for determining the mass of stars. Knowing the mass is the most important ingredient in understanding the evolution and other properties of stars.



Another interesting discovery in the last few years is that Polaris and many other Cepheids are shrouded in an envelope of gas, some 2 to 3 times the size of the stars themselves. The physical processes that have created these envelopes are still uncertain, but it is probable that these envelopes were created from matter ejected by the star itself.



As a consequence of the large amplitude oscillations of these humungous stars in a period of just a few days, material in the photospheres of these variable stars can be moving with velocities up to 100,000 km/h. It doesn't seem too unlikely that occasionally these stars might lose their gravitational grip on some of this fast moving material. Astronomers are studying the link between this pulsation, the mass loss and the formation of these envelopes.



Even stranger than all this, is the fact that Polaris has been steadily quieting down its pulsations over the last 100 years. Around 1900 the variations in brightness were about 10% of the average luminosity. During the last half of the 20th century, Polaris' variations had dropped to approximately 2%. No other Cepheid is known to have gone through this. Astronomers believed they were witnessing the evolution of the star before their very eyes, and that eventually we would see Polaris' variations snuff out entirely.

In the course of performing this death-watch, it was discovered recently that Polaris is actually coming back to life! The amplitude of pulsations is on the rise. The evolutionary explanation of the changes in Polaris may not hold water any more, and astronomers will be scrambling to collect more data to figure out what is actually happening.

So, while she may not be the brightest star in the night sky, Polaris is one of the most intriguing. This content distributed by the AAVSO Writer's Bureau.

IMPORTANT DATES

September 1—Venus 5° north of Moon
Mercury 3° north of Moon
September 2—Mars 5° north of Moon
September 3—Saturn in conjunction with the Sun
September 5—Public star party Mingo and Wagman (Come to Wagman at 6:30 p.m. for training on the Manka telescope)
September 6—Public star party Mingo and Wagman
Antares 0.3° north of Moon
September 7—First quarter Moon 10:04 a.m.
September 9—Jupiter 3° north of Moon
September 11—Mercury at greatest elongation (27° east)
Venus 0.3° north of Mars
September 12—7:30 p.m. Membership Meeting CSC
Mercury 3° south of Mars
Neptune 0.8° south of Moon
Uranus at opposition
September 15—Uranus 4° south of Moon
Full Moon 5:13 a.m.
September 18—Venus 3° north of Spica
September 19—Tentative Starhopping Class (call Tom Reiland 412-487-8326 or email TRcassiopeia@aol.com)
Mercury 4° south of Mars
September 20—Wagman Star Party
September 22—Last quarter Moon 1:04 a.m.
September 23—Mars 2° north of Spica
September 26—Ryerson Station State Park Star Party

September 27—Ryerson Station State Park Star Party
Mingo Star Party

Saturn 5° north of Moon

September 29—New Moon 4:12 a.m.

October 4—Mingo star party and Wagman star party

October 10—7:30 p.m. Membership Meeting CSC

October 17—Tentative Starhopping Class (call Tom Reiland 412-487-8326 or email TRcassiopeia@aol.com)

October 18—Wagman star party

October 25—Mingo star party



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