SIDEREAL TIMES

The Official Publication of the
Amateur Astronomers Association of Princeton

Director *Bill Murray*

Treasurer *Michael Mitrano*

Program Chairman *OPEN*

Assistant Director *John Church*

Secretary *Larry Kane*

Editors *Bryan Hubbard and Ira Polans*

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From the Director

As I am writing this we are suffering through yet another snowstorm, the fourth big one since December. I had planned on doing some planetary observing this winter but just when my observatory thaws enough so that I can get inside, we get another blizzard and it looks like an igloo again.

Because of this I have ended up doing some non-traditional observing (for me anyway, I'm basically a deep sky observer) when the weather is clear. As I reported last month I have been tracking the passes of the International Space Station (ISS) over NJ. There was a particularly nice one on the morning of Sunday Feb. 21st a little before 6 AM. The STS-130 mission to install the last big node, Tranquility on the ISS had completed a few days before and the shuttle had undocked from the ISS in preparation for coming home. I was able to see a double pass of the ISS and the shuttle that Sunday morning. Since there are only four shuttle missions left before the shuttle is permanently retired this is a sight you should plan to see for yourself, while there is still time.

An intriguing article in the March issue of *Sky and Telescope* suggested another activity that I have been pursuing. The article, titled "Observatories on the Web", was about web-based observatories (WBO's) that amateurs can access on the internet to rent time on a remote telescope. Many of these WBO's have extremely advanced set ups; large telescopes with sophisticated CCD cameras located in dark sky sites, some of which are in the southern hemisphere. For many years I have wished to take a trip to the southern hemisphere to see the skies down there and possibly do some astrophotography but logistics and time constraints have prevented me. The interesting thing about WBO's is that it is now possible to do this without traveling. I have decided over the next few months to investigate the four sites mentioned in the article and report on my experiences to the club.

The first site mentioned in the article is SLOOH (www.slooh.com). They operate three observatory complexes, one in the Canary Islands, one in northern Chile and one in southeastern Australia. Cost for membership is $5.95 per month or $50 per year. The admission price allows you to access a preprogrammed set of targets at each of the observatories. You can browse the list of targets and if one is of interest you can log on their site at the specified time and watch the target imaged live and capture some pics of it for yourself. You are supposed to be able to schedule a target for yourself if one that you're interested in is not listed.

The deadline for the April issue is:
Friday, April 2, 2010
Send your submissions to:
editors@princetonastronomy.org

SLOOH is easy to use but I have found it a bit frustrating. I bought a membership for one month and have been a member for more than two weeks. In that time I have not been able to schedule a single observation for myself at any of the three observatories due to computer problems at the SLOOH observatories. It's nice to view the live pics but I'm interested in a more interactive experience. I'll keep you posted on my results with the other WBO's.

Super Science weekend at The New Jersey State Museum will be on April 24th and 25th. Any members willing to bring out a small scope for solar observing will be highly appreciated.

Our next meeting will be on Tuesday March 9th at 8 PM at Peyton Hall. The speaker will be Professor Gillian R. Knapp of Princeton. The title of her talk is "The History of Carbon Stars".

Bill Murray, Director

Membership Meeting Minutes
February 9, 2009

The meeting was called to order by Director Bill Murray

1. There was no Director's report.

2. Assistant Director John Church stated that as the "acting Program Chair Pro Tem," he announced that we now have speakers for the remainder of the monthly meeting. At the dinner, tonight's speaker, Dr Strauss gave him some good ideas for next season's speakers. John shared the contents of an email to Michael Mitrano. The email announced that the cabin will not be built in Washington Crossing Park. Also, the park rangers might be made part of the State Police, and we may have to introduce ourselves to a "new cast of characters." Gene Ramsey stated that the neighbors to our observatory would call the local (township) police if they saw something out of order in the park.
3. Treasurer's Report: Michael Mitrano was not present, but his report appears in another section of this edition of Sidereal Times.
4. Secretary Report. Larry Kane announced that he is in the process of updating the membership roster. He passed around the member information, at this meeting, to verify its accuracy. When the task is completed, he will pass it on to the AAAP Web-master
5. Observatory Report: Co-Chair, Gene Ramsey announced that there will be a large amount of snow on the observatory roof and he suggested that we clear it off, before attempting to move the roof. Gene stated that he checked out Spaceweatther.com which showed an increase in solar activity in both the northern and southern hemispheres of the sun. He suggested that we should have a training session in the use of the C-14 with its new solar filter.
6. Outreach Report. Jeff Bernardis stated that we had our event at the Lawrenceville School. We have Super Science Weekend on the 24th and 25th of April. Plainsboro Township approached Jeff with an early notice of an event in May. A former member asked him if we could do a star party at his son's school. Jeff suggested that a teacher from the school should make the request.
7. Sidereal Times: The deadline for the next edition is Friday, February 26.
8. Old Business: There was no old business.
9. New Business: Director Murray announced a meeting of the Board of Directors for Thursday, February 25 at 7:00 pm.

The Director adjourned the meeting.

Larry Kane, Secretary

Please help update the membership roster

1. Point your browser to http://www.princetonastronomy.org/
2. Choose "Member Roster" from the site map.

The User Name is
The Password is

Please report any changes to:

Community Outreach

There's not too much going on with Community Outreach this time of year. Between the cold and the snow, we have not had many requests.

We are currently working on the following:

- On Earth Day, April 22, Hopewell Township is having their "Come Out and Play" day. One of the hoped for activities is Star Gazing. Rex Parker has sent in participation forms in the hope that we would have kids come out to the observatory in both the early evening (before dark) and later (after dark). The hours have yet to be firmed up.
- On May 2, Plainsboro Township is having their "Founder's Day". This is a day time event, and usually involves solar observing. Details have yet to be firmed up, but this event is still a long way off.

In addition to these, we have the upcoming Super Science Weekend – our annual event on the quad by the Trenton State Museum. Details will be forthcoming.

As usual, if you want to help out with any (or all) of these, please let me know. Even if you are cannot help with these specific events, if you would like to receive notifications (via email) of upcoming events, just contact me. I can be reached at

Jeff Bernardis, Outreach Coordinator

Interested in keyholder training?

or

Treasurer's Report

Membership now stands at 65, with total revenue from dues and other sources slightly below $2,900. Expenses thus far for the fiscal year beginning July 1 are about $3,500, resulting in a year-to-date deficit of about $600. Observatory repair expenses from last summer totaled about $1,600.

The Association's cumulative surplus is $17,643, so we remain on a solid long-term financial footing.

Michael Mitrano, Treasurer

March's Program

Our speaker for the Tuesday, March 9 meeting of the AAAP will be Professor Gillian R. Knapp of the Astrophysical Sciences Department at Princeton University. Dr. Knapp will be speaking on "The History of Carbon Stars."

Dr. Knapp received her BSc in physics from The University of Edinburgh and her PhD in astronomy from the University of Maryland in 1971. She came to Princeton in 1980 after working on the research staff at Cal. Tech's Owens Valley Radio Observatory. Her current projects include a study of the variability of stellar activity in dwarf main sequence stars using SDSS spectra; characterizing star formation in the nearby low-mass-star forming Taurus Molecular Cloud based on SDSS imaging and spectroscopy and imaging in the seven bands of the Spitzer space telescope; the luminosity/mass function of low-mass stars and brown dwarfs, in particular identifying the division between stars and brown dwarfs; high-velocity stars in the Galactic halo; dwarf carbon stars, including the search for radial velocity companions; and an investigation into the ages of local sub-dwarf stars.

We are currently planning a "Meet the Speaker" dinner at the Triumph Brew Pub on Nassau Street starting at 6 pm on March 9. Please contact Assistant Director John Church for a reservation by no later than Monday, March 8 if you would like to attend the dinner. One of Dr. Knapp's activities is in giving college-credit astronomy classes in the NJ prison system, and she is always interested in discussing this very worthwhile endeavor with others.

Other News…

APOD PHOTO—How did he do it?

You may have seen the Astronomy Picture of the Day, Night Waterway to Orbit on February 13th. I was intrigued not so much by the shot itself, which was beautifully staged, and accomplished, but with the apparent elevation. Looking on Google Earth I could see the Ponte Vedra Bridge but no indication of anything of sufficient height for the camera position. Accordingly, I emailed the author and the following is his reply.

Hi Bryan,

Thank you so much for your kind words about my Endeavor Space Shuttle Launch Photo from Monday February 8, 2010. I apologize for the delay in responding to you, I have been overwhelmed and humbled by the amount of responses I have received. I have posted my photo on my website for people to see and read a little bit more about how I captured the shot. If you haven't already been to the site, here is a link http://www.jamesvernacotola.com/Space Feel free to check it out.

As far as your question about road height, the Intracoastal Waterway Bridge in Ponte Vedra is higher than you might imagine for being in a predominantly residential area. You can see a photo of it here.

http://upload.wikimedia.org/wikipedia/commons/b/b9/New_Palm_Valley_Bridge.jpg

I hope you don't mind, I used this question in part of the info about the photo.

Thanks again,

Jimmy

In Search of Antimatter Galaxies

NASA's space shuttle program is winding down. An act of Congress in 2008 added another flight to the schedule near the end of the program. This extra flight of the shuttle is going to launch a hunt for antimatter galaxies. At the moment the scheduled launch is July 29, 2010. The device that does the actual hunting is called the Alpha Magnetic Spectrometer--or AMS for short. It's a $1.5 billion cosmic ray detector that the shuttle will deliver to the ISS.

In addition to sensing distant galaxies made entirely of antimatter, the AMS will also test leading theories of dark matter, an invisible and mysterious substance that comprises 83 percent of the matter in the universe. And it will search for strangelets, a theoretical form of matter that's ultra-massive because it contains so-called strange quarks. Better understanding of strangelets will help scientists to study microquasars and tiny, primordial black holes as they evaporate, thus proving whether these small black holes even exist.

"For the first time, AMS will measure very high-energy cosmic rays very accurately," explains Nobel laureate Samuel Ting, a physicist at the Massachusetts Institute of Technology, who conceived of the AMS and has guided its development since 1995.

Excerpted from NASA Science.
For the full article go to http://science.nasa.gov/headlines/y2009/14aug_ams.htm

Hubble Sees Suspected Asteroid Collision

February 2, 2010: NASA's Hubble Space Telescope has observed a mysterious X-shaped debris pattern and trailing streamers of dust that suggest a head-on collision between two asteroids. Astronomers have long thought that the asteroid belt is being ground down through collisions, but such a smashup has never been seen before.

The object, called P/2010 A2, was discovered by the Lincoln Near-Earth Asteroid Research (LINEAR) sky survey on Jan. 6. At first, astronomers thought it might be a so-called "main belt comet"--a rare case of a comet orbiting in the asteroid belt. Follow-up images taken by Hubble on Jan. 25 and 29, however, revealed a complex X-pattern of filamentary structures near the nucleus:

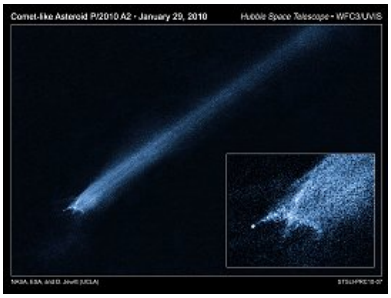
"This is quite different from the smooth dust envelopes of normal comets," says principal investigator David Jewitt of the University of California at Los Angeles. "The filaments are made of dust and gravel, presumably recently thrown out of the nucleus. Some are swept back by radiation pressure from sunlight to create straight dust streaks. Embedded in the filaments are co-moving blobs of dust that likely originated from tiny unseen parent bodies."

Hubble shows the main nucleus of P/2010 A2 lies outside its own halo of dust. This has never been seen before in a comet-like object. The nucleus is estimated to be 460 feet in diameter.

Normal comets fall into the inner regions of the solar system from icy reservoirs in the distant Kuiper belt and Oort cloud. As comets approach the sun and warm up, ice near the surface vaporizes and ejects material from the solid comet nucleus via jets. But P/2010 A2 may have a different origin. It orbits in the warm, inner regions of the asteroid belt where its nearest neighbors are dry rocky bodies lacking volatile materials.

This leaves open the possibility that the complex debris tail is the result of an impact between two bodies, rather than ice simply melting from a parent body.

"If this interpretation is correct, two small and previously unknown asteroids recently collided, creating a shower of debris that is being swept back into a tail from the collision site by the pressure of sunlight," Jewitt says.



Asteroid collisions are energetic, with an average impact speed of more than 11,000 miles per hour--five times faster than a rifle bullet. The main nucleus of P/2010 A2 would be the surviving remnant of this so-called hypervelocity collision.

"The filamentary appearance of P/2010 A2 is different from anything seen in Hubble images of normal comets, consistent with the action of a different process," Jewitt says. An impact origin also would be consistent with the absence of gas in spectra recorded using ground-based telescopes.

The asteroid belt contains abundant evidence of ancient collisions that have shattered precursor bodies into fragments. The orbit of P/2010 A2 is consistent with membership in the Flora asteroid family, produced by collisional shattering more than 100 million years ago. One fragment of that ancient smashup may have struck Earth 65 million years ago, triggering a mass extinction that wiped out the dinosaurs. But no such asteroid-asteroid collision has been caught "in the act"--until now.

At the time of the Hubble observations, the object was approximately 180 million miles from the sun and 90 million miles from Earth. The Hubble images were recorded with the new Wide Field Camera 3 (WFC3).

Editor: Dr. Tony Phillips | Credit: Science@NASA
The article including images can be viewed at http://science.nasa.gov/headlines/y2010/02feb_asteroidcollision.htm

Submitted by Bryan Hubbard

STS 130 Shuttle Endeavour and the Solar Dynamics Observatory (SDO) Launches: Reporting Live from the Kennedy Space Center

During this past month of February 2010, I was incredibly lucky to be an up-close eyewitness to two significant NASA space launches; The STS 130 mission of Space Shuttle Endeavour to the International Space Station (ISS) and the Solar Dynamics Observatory (SDO) to study the sun in unprecedented detail.

I had a front row seat to watch both blast offs from the Kennedy Space Center (KSC) Press Center, which took place just 3 days apart on Feb 8 and Feb 11. That is as close as humans are permitted, viewing conditions were excellent, and they were completely different in every respect. Endeavour lit the sky on fire for the final night time launch of a space shuttle. SDO roared to space on an Atlas rocket in the late morning. Then I saw Endeavour return to land at KSC, also at night, on Sunday Feb 21.

But the liftoffs were quite alike in another respect. Both experiences were thrilling beyond belief, and I was able to see the Endeavour astronauts close up twice and interview the top SDO mission scientists. Prior to launch, I also watched both the Shuttle and Atlas 5 rockets roll out to their respective launch pads.

During the two-week flight, the STS 130 crew brought aloft and installed the Tranquility habitation module and the Cupola observation dome and conducted three totally successful spacewalks. Tranquility houses critical ISS life support systems. The Cupola possesses seven spectacular windows affording dazzling vistas of the earth below and the cosmos above. The station is now 98 percent complete by volume and 90 percent complete by mass.

SDO is a cornerstone science mission that will revolutionize our basic understanding of the dynamic behavior of how the sun functions from its deep interior, how storms propagate to the surface and are then ejected violently outwards towards the entire solar system. The resulting "space weather" impacts every aspect of life here on Earth.

For complete details please read my online articles posted at The Planetary Society and Universe Today websites.

Check these 2 reports for links to my STS 130 online articles

- Endeavour Launch Ignites Night Sky http://planetary.org/blog/article/00002340/
- STS 130: Cool Night Landing Video from the Shuttle Strip http://www.universetoday.com/2010/02/28/sts-130-cool-night-landing-video-from-the-shuttle-strip/
- Endeavour Crew Preps for Sunday Landing as Showers Threaten Delay http://www.universetoday.com/2010/02/20/endeavour-crew-preps-for-sunday-landing-as-showers-threaten-delay/

Check these two reports for links to my SDO online articles

- Revolutionary NASA Solar Explorer Roars to Space http://planetary.org/blog/article/00002346/
- NASAs Solar Crown Jewel Bolted atop Atlas Rocket http://www.universetoday.com/2010/01/29/nasas-solar-crown-jewel-bolted-atop-atlas-rocket

Submitted by Ken Kremer

Endeavour and Ken Kremer at Pad 39 A prior to Feb 8, 2010 launch from KSC. Credit: Ken Kremer

20 Years Ago In Sidereal Times...

Sidereal Times

DIRECTOR: Larry Smith MARCH 1990 EDITOR: JWHS

The March meeting of the AAAP will take place at Peyton Hall on Tuesday March 13 at 8:00 P.M. The speaker will be world-renowned atrophysicist Jim Gunn. The title of this talk is "High Red-Shift Quasars". Professor Gunn of Princeton University discovered these objects using the Palomar telescope and his own specially-designed camera. Come hear Professor Gunn describe the most distant object yet discovered in the Universe!

The pre-meeting dinner with Professor Gunn will be at 5:45 at the Tiger's Tale at the NW corner of Route 518 and US 206. All members are welcome to join us at this dinner.

And: be prepared! That's because our April meeting may be a members' night! It's not certain yet; but---BE READY, if it is!

-Don Monticello

ASTROPHOTOGRAPHY HINT #976

Pardon me, but I couldn't resist calling the following "hint #976"! That's because---as all of you know---I have a---BIG mouth:

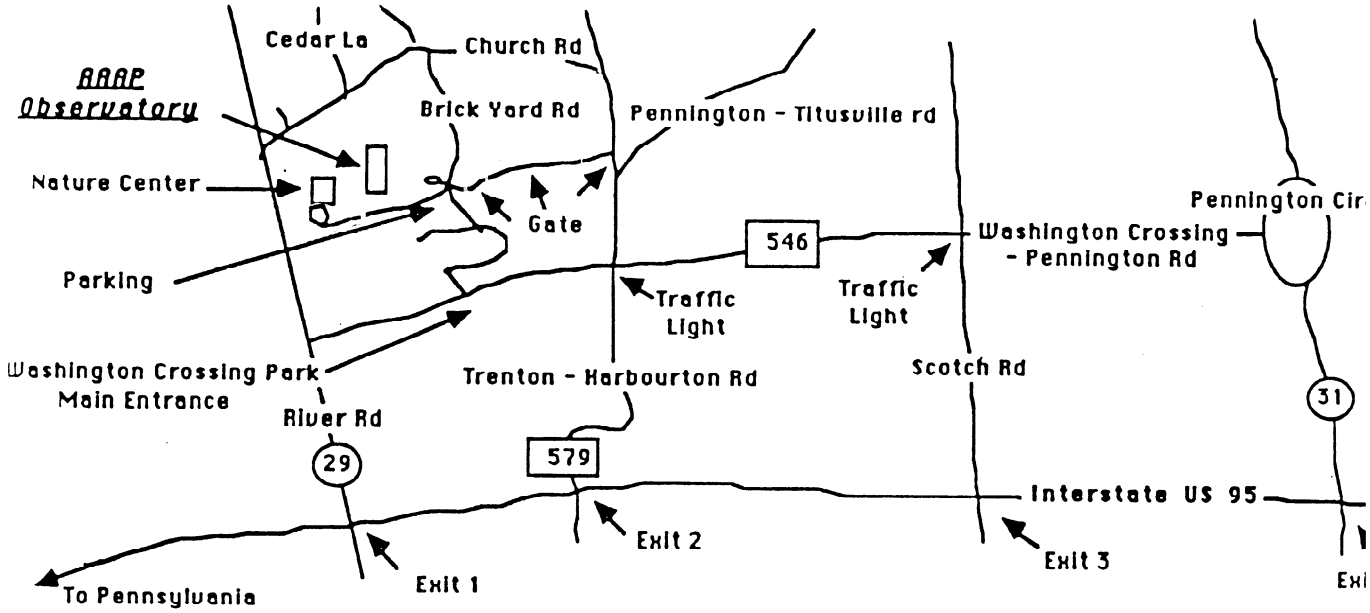
But this is in response to Pat Colestock's queries about some tips on how to get good astrophotographs; so I'll "take the plunge"! (By the way, Pat: don't you see why I consider it ironic that you are asking MY advice? After my visit to PPPL, and my realization of the GENIUS that's "rampant" out there, I felt so INEPT---by comparison---that I've decided to quit photography altogether and have applied for a job as a DISHWASHER'S ASSISTANT.....) So let me forge ahead:

1. Which filter(s) should I use? Does a filter change my exposure times? And are there better filters for comets (like the so-called "Swan filter"?
Let me answer simply: I recommend Lumicon's "Deep Sky Filter". It is an "overall"filter; that is, it has

the widest "usability". In general, add about 50% more to your exposure times, as the filter blocks out a portion of the light. As to the best filter for comets: remember that a prime purpose of filtering is to eliminate light-pollution sky-fog, one of the best---if not the best---filters for this is the Deep Sky filter. And consider a comet "another nebula".

2. Is there an "exposure guide" for objects of magnitudes 2 or 3? And one for several types of film?
HEY PAT! I KNOW YOU'VE A DOCTORATE! BUT---GIVE ME A BREAK! Ask me a SIMPLE QUESTION! Sorry---I'm calm now: No, there is no specific exposure guide for objects this bright. But consider this: you want your film to cover a certain "range". And you want that film to render details within that range. Let me give you an example, the Orion Nebula: you want to depict the subtle irridesences in the wisps; and 2. you want also to show some details in the area of the Trapezium. But: the range of brightness is SO VAST that it's really a matter of "either/or". So when I photograph the Orion Nebula---which I hope we'll be able to do during my next "astrophotography session"---I always recommend a "shorter than usual" exposure time---on the order of 12-15 mintues. This way, you preserve the Trapezium's details, and they aren't all washed out. So leave it this way: if you want to preserve details in an object of mag 2 or 3, make your exposure time "a bit shorter". As to "several types of film": 1. the higher the ASA/ISO, the shorter the exposure times, within limits. Those limites are reciprocity failure. But it's still true that a very fast film---ASA 1600, ASA 3200 (especially when hypered)---will need noticeably shorter exposure times. Personally, I still go with the "slower" (lower ASAs) films, as my own chief goal is to be able to make fairly large (8x10, 11x14) prints. And enlargements of that size emphasize very fast film's defecits---GRAIN. I like sharp pictures.

3. Some tips on piggyback photography and comet tracking. At last, AN EASY QUESTION! THANKS, PAT!
Let me answer in reverse. There is only ONE WAY to photograph a comet: PIGGYBACKING. That is because the only way to guide during a comet shot is to guide on the comet's nucleus, because as we all know, a comet does not move at sidereal rate, and if you use a "guide star", the comet will be blurred. So: plan on taking your cmera out and mounting in on the Simpson reflector (AAAAHHHH....), and using the prime 12.5" optics to use as a guide 'scope. As to



The best way to get to the observatory is to take Interstate 95 South towards Pennsylvania. Then take Scotch road at Exit 3 and proceed north (this amounts to right). Then, at the third traffic light take a left onto the Washington Crossing-Pennington road (County Route 546). Take this road to the first traffic light and take a right onto Trenton-Harbourton road (County Route 579). Take this road to the first driveway on the left, this is the Phillips Farm/Soccer Field entrance to the park. There is a series of three gates with club combination locks. If the gates are not open, you will need the lock combination to open the gate or be accompanied by a Keyholder member. The Simpson (AAAP) Observatory's phone number is (609) 737-2575.

See us on the Web: www.princetonastronomy.org

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