SIDEREAL TIMES

The Official Publication of the
Amateur Astronomers Association of Princeton

Director
Ludy D'Angelo

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Michael Mitrano

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John Church

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Jeff Bernardis

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Larry Kane

Editors
Bryan Hubbard and Michael Wright

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From the Director

It seems time goes so fast. Just yesterday (actually 2 weeks ago) we had our last meeting, and it is November already. I don't mind, it just gets me to the next meeting of the AAAP just that much sooner. Our next meeting will be November 9th at 8 PM in Peyton Hall. Our speaker will be Jerry Lodriguss, a photographer and astro-photographer. As with the last meeting, it will be a fantastic program.

WELCOME!
There are also many new members who have joined the club recently. Some of them are Arthur Firestone, Eric Kauffman, Kevin Burkman, Steve Newfield, and Sanjay Phanse. There are several others, and I hope to introduce them at our next meeting. Please welcome them with me into this great club of ours and help them perpetuate whatever their interest is in our hobby of amateur astronomy.

Friday October 29th was the last public night out at the Simpson Observatory for the 2010 season. It ended with a clear night and a small crowd of enthusiastic campers and observers visiting. Overall, I think this season was a good one, and more clear nights than usual on the whole. But Friday nights are not the only times that the observatory can be open. For all of you, access to the observatory is one of the benefits of membership in the club. So don't be shy, if you want to go out, call a keyholder you may know and do some observing.

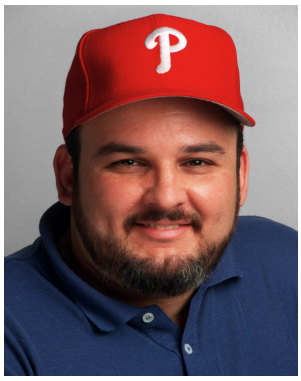
There will be an AAAP Board of Directors meeting on Thursday, November 4th at 7:30 PM in Peyton Hall. If any one would like to attend, please let me know.

See you all on the 9th!

Ludovico D'Angelo, Director

November Meeting

Our speaker for the November 9th meeting will be Jerry Lodriguss, amateur astronomer and astrophotographer *par excellence* for more than 40 years. The title of Jerry's talk will be "Secrets of DSLR Astrophotography." He will talk about using your DSLR camera to photograph the most amazing show in the universe – the night sky. He will explain how to get started with very simple and easy methods such as a camera on a fixed tripod and advance to more sophisticated techniques such as stacking and narrowband hydrogen-alpha imaging. Secrets will be revealed. These include: determining the correct exposure, focusing with Live View, and correcting the color balance in the camera.



Jerry first became interested in astronomy at the age of seven when he looked through a "spyglass" at the Moon and was amazed to see that it had craters. He discovered his love for photography when he was 17 years old, when he bought a camera to take pictures through his homemade 10-inch reflecting telescope.

Jerry's professional photography career began in 1974 while working part-time shooting high school sports for $5 per picture at a small suburban weekly newspaper in New Orleans. He has worked for the Associated Press, United Press International, *Sports Illustrated*, *Time*, *Newsweek*, *New York Times*, *Washington Post*, *and USA Today*. From 1987 until 2009 he worked at the *Philadelphia Inquirer* as their staff sports photographer. An ardent Phillies fan, Jerry and the rival Yankee fans in this area

share their mutual disappointment that their respective teams couldn't meet in the World Series this year.

Today, Jerry is an author and photographer who has written for *Sky and Telescope*, *Astronomy* and other magazines. His astronomical photographs have also appeared in books and publications all over the world. He has written and published four books:

- Photoshop for Astrophotographers
- Catching the Light - A Beginners Guide to the Wonders of the Cosmos
- A Guide to Astrophotography with Digital SLR Cameras
- A Beginner's Guide to DSLR Astrophotography

Visit Jerry's website at www.astropix.com for more information.

There will be a "Meet the Speaker" dinner at the Triumph Brewing Company on Nassau Street, beginning at 6:00 PM before the meeting. For reservations, please contact John Church by no later than 6:00 PM on Monday, Nov. 8th so that a table can be reserved. (Note: this is earlier than usual due to travel arrangements.)

John Church, Program Chair

Treasurer's Report

Since my last report, dues payments have begun flowing in strongly. To date we have 46 members paid up for the current fiscal year, totaling $1,840 in dues compared to the totals of $3,560 for all of last year and $4,147 for the year before. If you have not sent in your dues, please do so.

StarQuest was a success financially as well as astronomically. This fall's event had a surplus – assuming that all expenses are in – of about $600 on revenues of $1,700. This is close to the 2009 event's results, where we had a $660 surplus on $1,900 revenue. Thanks go to Ludy, the assistant chefs, and others who made StarQuest successful.

Other expenses thus far have been modest. Later in the year we will incur our annual insurance expense, as well as an anticipated outlay for a new alarm system at the Washington Crossing observatory.

Our surplus for the fiscal year-to-date is approximately $2,000. Our net assets on a cumulative basis are about $20,500.

Michael Mitrano, Treasurer

From the Program Chair

The program lineup for the 2010-11 club season is coming along nicely. On October 12, Suzanne Staggs of the Princeton Physics Department spoke to us on cosmology and the cosmic microwave background, with some extremely interesting results derived from Fourier analysis of slight irregularities in the CMB.

On November 9, a treat will be in store for our astrophotography fans when we will have Jerry Lodriguss, a well-known astrophotographer with several books to his credit, to speak on "Secrets of DSLR Astrophotography." See the separate article in this issue. Jerry will have copies of one of his CD's for sale during the break.

Our December 14 meeting will feature Bob Vanderbei, of both Princeton University and AAAP, to discuss his new National Geographic book co-authored with J. Richard Gott, "Sizing Up the Universe." The book, which will feature many of Bob's photos taken from his driveway, will be in stores by late November. Bob will be doing signings during the intermission.

On January 11 we will have our own Ken Kremer to speak on "The Space Shuttle, The Space Station, and What's Beyond for NASA." The talk will include many of Ken's photos and descriptions from personal behind-the-scenes visits to the Kennedy Space Center at Cape Canaveral, where Ken has a press pass.

On February 8 we have a tentative speaker lined up from Franklin & Marshall College in Lancaster, PA, with name and topic to be announced later. Confirmation awaits the speaker's determination of the springtime academic schedule.

March and May are still open as of this writing. On April 12 we will have Michael Molnar to speak on "The Star of Bethlehem," a topic he has extensively researched. Michael will be signing copies of his book on this subject during the intermission.

June 14 will feature a planetarium show by AAAP's Bill Murray. If the one he gave last June is any indication, we are in for another treat!

John Church, Program Chair

Board of Directors Meeting
November 4, 2010, 7:30 PM
Peyton Hall upper meeting room

As always, all members are invited to attend and raise any issue that may be important to the AAAP.

From the Outreach Chair

First, I would like to introduce myself as your new Outreach Chairperson. My name is David Letcher and I have been a member of AAAP for a few years now. I live in Ewing Township, and I am a Professor of Applied Business Statistics in the School of Business at The College of New Jersey. I have taken over the job of Outreach Coordinator from Jeff Bernardis who has been very helpful to me during this time in which I am getting used to the job.

So far, we have had two Outreach activities this season. One was giving a star party to two troops of cub scouts in the evening of Saturday, October 16th. I initially scheduled one troop but another troop that was camping nearby took our invitation and attended too. I guess we had approximately 50 scouts plus their parents! It was a crystal-clear, but chilly evening, but the seeing was pretty good. Gene Ramsey, David Zahler, and I brought our own scopes, and Jeff Bernardis operated the scopes in the observatory. Apologies if I forgot other members who may have been there too. It was crowded!

Wednesday afternoon saw me giving a PowerPoint presentation on the solar system to a girl scout troop at the Bear Tavern Elementary School in Hopewell Township. One of my slides was a photograph of a region of the sky that included the constellation of Leo; just a lot of stars and nothing else. So I asked the girl scouts to look at it and see if they see any patterns. After just a few minutes they began to see the patterns of Leo and then one of the scouts said "That is Leo The Lion!" It was a grand time had by all.

We have received additional requests from other people recently. Right now I am talking with the following people about offering some sort of program to them:

1. A request from a cub scout group in Colts Neck for a speaker about astronomy.
2. The Upper Freehold Regional Elementary/Middle School PTA is asking if we want to participate in their Family Science Night on Friday, November 12, 2010. I understand that AAAP participated last year. This will be in Allentown, NJ.
3. The Dutch Neck Elementary School PTA Fourth Annual Science Day event will be held on March 25, 2011. It is a full day of scientific presentations and experiments for K-3 students.
4. Dee Bosch, one of our own members, is asking for us to hold a star party in a school in Pemberton, NJ. The date(s) haven't been set up yet.

So far, those are the outreach items. I'll be sending out email notices about where and when these events will be held. Clear Skies!

David Lechter, Outreach Chair

October 2010 Meeting Minutes

The meeting was called to order by Director Ludy D'Angelo.

The Director presented observatory keys to our new key-holders, David Zahler and Victor Davis, in recognition of their completing observatory training.

Rex Parker gave a report on the device he used at StarQuest, to measure the sky "darkness." His measurements indicated that the sky in Hope, NJ was one full magnitude darker than at Washington Crossing.

Outreach: Member David Letcher has assumed the responsibilities of Outreach Coordinator. He announced that we have two events scheduled. The first, this coming Saturday is two troops of boy scouts at our W/C observatory. The other, some time in November is a two night event in Pemberton, NJ and was requested by member Dee Bosch. Dee noted that member and co-editor of the Sidereal Times, Michael Wright, has helped her to get her school's telescope to work correctly.

Secretary Larry Kane stated that corrections to errors on the roster are being finalized.

Program Chair John Church noted that the next speaker for our Tuesday lecture series in Jerry Lodriguss. He is a professional sports photographer for the Philadelphia Inquirer and noted astro-photographer. Jerry has written several books on astrophotography. John proceeded to highlight the speakers for the remainder of the season.

Treasurer's report: The Treasurer's report appears in another section of the Sidereal Times.

Observatory Co-chair Gene Ramsey reported that he has found some good information on repairing the observatory's refractor mount. Members Rex Parker and John Church offered to help Gene find articles that will assist the repairs. Member and Assistant Director Jeff Bernardis gave Gene some material on security systems that might replace the present observatory system. Developing a new set of directions and a new map to the observatory were discussed. Gene asked that a work party of members be assembled for the following Saturday to clear brush and brambles and do some painting. It was noted that we need to complete the drainage work. Member Saul Moroz asked if an "air chair" could be purchased for the observatory. Member Brian Van Liew suggested that some of the hollows around the building be filled in thus creating more even space to set up telescopes.

Sidereal Times: The deadline for the November issue is October 29.

Larry Kane, Secretary

Gas Giant Dreams

Several nights before and after the recent opposition of Jupiter were great for telescope observing and imaging the gas giant. I was able to get some decent images from my backyard astro-imaging setup just before Labor Day when I could afford to be sleep-deprived while on vacation from work.

The image above was taken with a CCD camera (SBIG ST10XME with CFW8/RGB filters) and my 5-inch, f8 Takahashi FS128 refractor with 5X Barlow. This arrangement yielded f/40 and approx. 5000 mm FL. Even while using a ~700X 500 pixel subframe at 0.1-0.5 sec per image, it took many hours to acquire the hundreds of individual L,R,G,B frames to find the best "seeing" images to put the LRGB composite together. In a way I guess this turned out to be an advantage since I had to stay out much later than I would have otherwise, and Jupiter reached transit at nearly 4 AM with me still taking frames. The best frames were selected using a subroutine which grades sharpness (from CCDOps). Then they were assembled using MaximDL from single ~0.2 sec exposures for each RGB filter and 60% L (luminance) and combined for the LRGB composite. The S/N was high enough to not need to stack sub-frames.

When I finally did get to sleep I dreamed of life on the gas giant. (Anyone else read the sci-fi novel, The Algebraist by Ian M Banks?)

Rex Parker

The deadline for the December Sidereal Times is Wednesday, December 1, 2010
Please submit articles to:
editors@princetonastronomy.org

Orion Launch Abort System Stops in Philadelphia

A full scale mock-up of the Orion Launch Abort System (LAS) is hitting the road for a cross country trek of several museums and science centers. The public can see the LAS spacecraft hardware up close and personal and learn about the Orion crew vehicle and abort system. I visited the LAS in Philadelphia, PA where it was on display at the Franklin Institute Science Museum during the weekend of Oct 16 & 17, 2010.

It is a rather startling and rare sight to behold the 45-ft. long rocket assembly mock up sitting pretty on a long flatbed tractor trailer outside the steps of the architecturally grand museum in the midst of the bustle of a major American city with cars driving by. The spacecraft hardware was far too large to bring inside the museum.

The impressive rocket display and information panels were popular with kids and adults passing by. The outdoor display was accompanied by an exhibition booth inside the museum atrium which was manned by engineers from Orion's prime contractor Lockheed Martin and sub contractor ATK to explain Orion spacecraft operations.

Orion is NASA's next generation manned spacecraft and is designed to eventually replace the Space Shuttle. The shuttle will be retired sometime in 2011. The first Orion orbital test flight - dubbed OFT-1 - is set for 2013.

The LAS is designed to immediately pull the Orion crew module away from the launch vehicle during an emergency on the pad or during the climb to orbit and save astronaut's lives.

Known as the LAS pathfinder, the mock up is traveling the roadways from the U.S. Army's White Sands Missile Range in New Mexico to NASA's Kennedy Space Center (KSC) in Florida. At KSC, it will undergo future pathfinding operations for investigation with the Orion crew exploration vehicle to prepare for the OFT-1 flight.

Between New Mexico and Florida, the LAS is making several public stops. The next stop was in Hampton, Va on Oct. 23 for the 2010 EarthFest at Sandy Bottom Nature Park near the NASA Langley Research Center.

"This LAS pathfinder was used by ground crews to practice lifting and stacking operations at the launch pad to help prepare for handling the actual flight hardware used in the flawless Pad Abort 1 (PA-1) test flight," Heather McKay told me. McKay is a propulsion engineer for Lockheed Martin in Denver. "The LAS is the highest thrust and fastest acceleration abort system ever tested. This is the only abort system of its kind in the world and it's state of the art. It is equipped with three types of solid rocket motors. The innovative abort system will significantly improve astronaut safety for future human space flight."

The PA-1 test took place on May 6, 2010 at the U.S. Army's White Sands Missile Range near Las Cruces, N.M. During the test, the system fired the abort motor thrusting the crew module mock-up off the pad, reaching a speed of about 445 mph in three seconds. PA-1 Test Flight YouTube Video. See more pictures here.

At this moment in late October, I am now at the Kennedy Space Center for STS-133. The LAS has arrived and I will report further next month.

Photo Credit: Ken Kremer

Orion Launch Abort System (LAS) on display at the front entrance of the Franklin Institute Science Museum in Philadelphia, PA during the weekend of Oct. 16 & 17, 2010. The abort motor (center nozzles) generates 500,000 pounds of thrust to accelerate the Orion from 0 to 445 MPH in under 3 seconds in case of an emergency.

Photo Credit: Ken Kremer

Philadelphia City Skyline and NASA's Orion LAS on 16 Oct. 2010.

Photo Credit: Ken Kremer

Passersby enjoy the Orion LAS on display at the Franklin Institute Science Museum, Philadelphia, PA on Oct. 16/17. The LAS performed a flawless test flight during Pad Abort 1 test on May 6, 2010.

Photo Credit: Ken Kremer

Lockheed Martin propulsion engineer Heather McKay explains operation of the abort motor she helped develop and which activates in milliseconds to save astronauts lives in case of an emergency abort. The abort motor was built by ATK in Utah.

Please contact me for more info or science outreach presentations at or via my website.

Ken Kramer

SnippeTs

Planets

NASA's Kepler spacecraft has discovered the first confirmed planetary system with more than one planet crossing in front of, or transiting, the same star.

The transit signatures of two distinct planets were seen in the data for the sun-like star designated Kepler-9. The planets were named Kepler-9b and 9c. The discovery incorporates seven months of observations of more than 156,000 stars as part of an ongoing search for Earth-sized planets outside our solar system.

Scientists refined the estimates of the masses of the planets using observations from the W.M. Keck Observatory in Hawaii. The observations show Kepler-9b is the larger of the two planets, and both have masses similar to but less than Saturn. Kepler-9b lies closest to the star with an orbit of about 19 days, while Kepler-9c has an orbit of about 38 days. By observing several transits by each planet over the seven months of data, the time between successive transits could be analyzed.

The full article may be found at http://www.nasa.gov/mission_pages/kepler/news/two_planet_orbit.html

Technology

NASA and the Spaceward Foundation awarded a prize of $900,000 to LaserMotive LLC of Seattle, Washington for their winning performance in the Power Beaming Challenge competition held on Nov. 4th through 6th at the NASA Dryden Flight Research Center. The Spaceward Foundation of Mountain View, CA manages this competition for NASA's Centennial Challenges Program.

The Power Beaming Challenge is a demonstration of wireless power transmission in which teams build and demonstrate systems to beam energy from the ground to a robotic device that climbs a vertical cable. To compete, teams must integrate a complex set of technical skills for optical beam forming, electromechanical beam tracking, photovoltaic beam conversion, power capture electronics, and mechanical drive. To win a prize, the climber must reach the top of the cable at a height of one kilometer. Teams that can reach the top share in the prize purse of $2,000,000 based on their vertical speed and payload mass. LaserMotive's average speed on their best of several successful climbs was 3.9 meters per second and by exceeding the average speed of 2 meters per second and being the only team to reach the top, they claimed the entire $900,000 prize for that level. Teams had to exceed an average speed of 5 meters per second to qualify for a share of the remaining prize purse of $1,100,000. That amount will remain available for the next Power Beaming competition.

The full article may be found at

http://www.nasa.gov/offices/oct/early_stage_innovation/centennial_challenges/cc_pb_feature_11_10_09.html

Historical Moments

75 Years Ago

July 2, 1935: The Air Defense Research Committee in the United Kingdom heard the first report on radio direction finding (RDF, later called RADAR). The historic development quickly transformed British air defenses in preparation for war.

65 Years Ago

July 13, 1945: An armed forces circular announced the activation of the White Sands Proving Ground. Later known as White Sands Missile Range, the facility was the largest over-land test installation in the western hemisphere and remains the largest today.

60 Years Ago

July 24, 1950: General Electric Co., in cooperation with NASA's Jet Propulsion Laboratory of Pasadena, Calif. launched the Bumper #8 rocket. It was the first rocket launched from the recently established Long Range Proving Ground at NASA's Kennedy Space Center, Fla. The purpose of the mission was to test methods of stage separation while a rocket is performing a near-horizontal flight.

50 Years Ago

July 1, 1960: NASA launched the first complete Scout launch vehicle fired from Wallops Flight Facility at Wallops Island, Va. (part of NASA's Goddard Space Flight Center in Greenbelt, Md.). The rocket quickly became a workhorse in orbiting scientific payloads because Scout's four-stage booster could place a heavy satellite into orbit.

Credit: NASA Science

StarQuest 2010

Left: Waiting Patiently for the Raffle to Begin
Photo Credit: Ludy D'Angelo

Right: Observers Prepare Their Scopes
Photo Credit: Ludy D'Angelo

Left: Checking out AAAP's Reflector at the UACNJ Observatory at Jenny Jump State Park.
Photo Credit: Michael Wright

Right: Doing the Jenny Jump
Photo Credit: Michael Wright

Twenty Years Ago in Sidereal Times

SIDEREAL TIMES

Amateur Astronomy Association of Princeton

Director: Larry Smith Editor: JWHS

NOVEMBER 1990

EDITORIAL

"Short and to the point": I feel obligated to pass on AAAP's gratitude to Dr. Gott for his wonderful talk to us at the October meeting about General Relativity! I'm certain that all who attended this talk gained a better insight on the significance of not only General Relativity but also saw why the renownded Albert Einstein is---renowned!

And by the way Dr. Gott: after investigating the dynamics of Reimann tensors, I---got a HEADACHE! Thanks!

-JWHS

PRE-MEETING NOTES

It is not all that common that AAAP is fortunate to have two "home runs" in a row, but it is certain that Professor Freeman Dyson's November 13th talk at our November meeting will indeed be another home run. The lead-off home run was of course Dr. Gott's October meeting talk on General Relativity. This month, Professor Dyson's topic will be "Comets".

Prof. Dyson is an internationally-known mathematician and theoretical physicist, as well as an accomplished author; and his most well-known work, "Infinite in All Directions" can be found on the science shelves of most book stores.

Prof. Dyson has been a member of AAAP for over 20 years, and has interests in all areas of astronomy and cosmology, both amateur and professional. He holds a particular fascination for comets as a scientific interest, and because they are the largest accessible habitat for the growth of life in the Universe. Prof. Dyson contributes frequently to the professional scientific literature and is known for encouraging our National Space Program to undertake more small---and frequent---scientific space missions.

There will be no pre-meeting dinner this month.

-Vic Belanger

FROM THE TREASURER

At this writing the Treasury balance stands at $2,197.89. I will be sending a check to Bill Murray for the Sky Vector II digital setting circles with sky catalog, 6¼" dewcap, and Telrad dewshield. This will come to about $665.00 This will give us ample money in the Treasury to see us into the new year and be able to buy the 9mm Nagler 2" eyepiece in the Spring.

One other thing: Sky Publications, publishers of Sky & Tel, will raise its club subscription rate by $2.00 the first of the year. This will not offset the dues structure, but if anyone's dues are due around the first of the year, please try to get it to me in December. This will give the club and extra $2.00 which it will lose after the first of the year.

I would like to welcome some new members who have joined the AAAP in the last two months: Ted Williams, Michael Menzel, Dale and Nathan Shaner, David Kuehne, and David Axelrod. Welcome aboard!

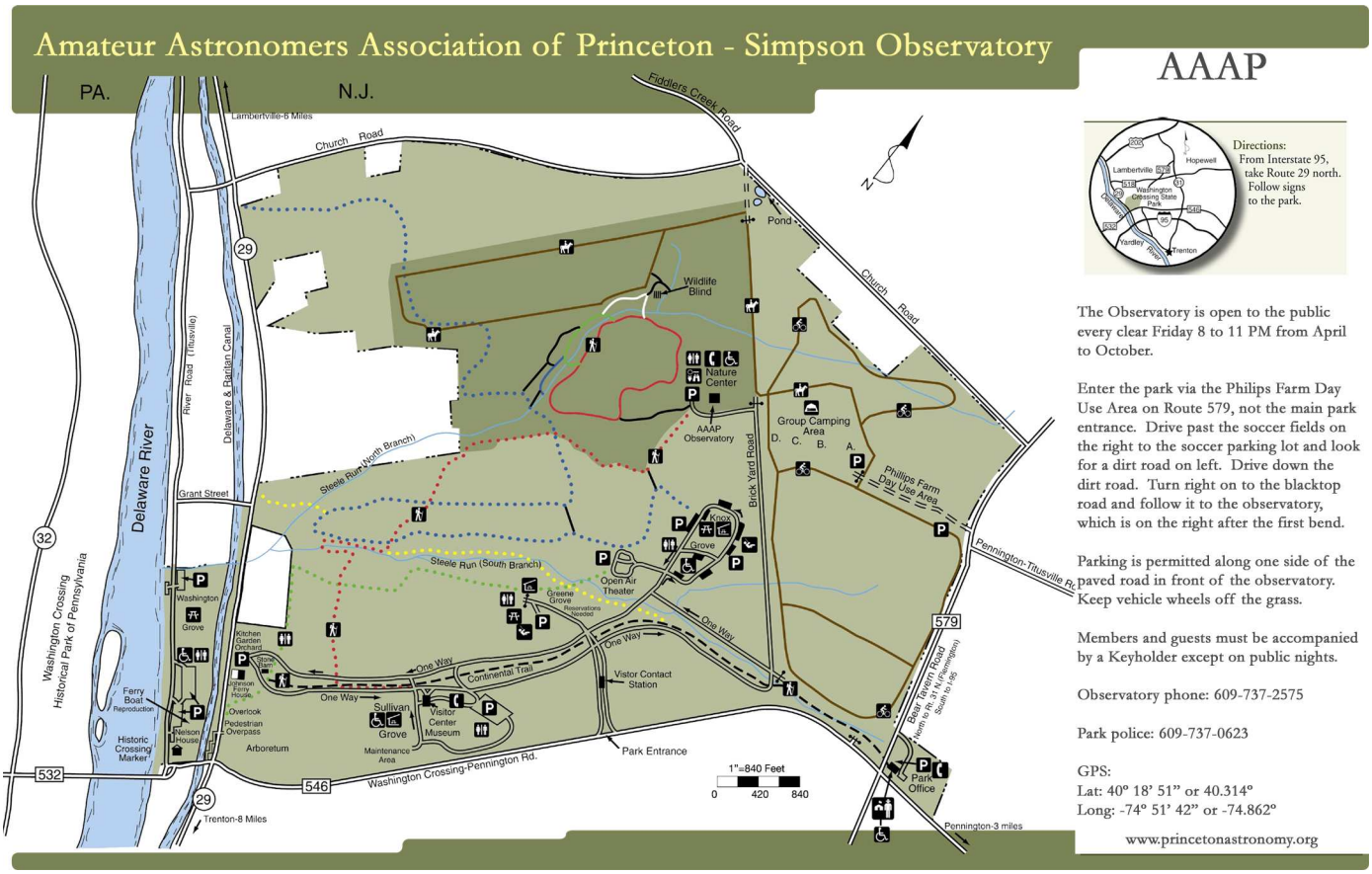
-Ron Mittelstaedt

NOT NECESSARILY AAAP NEWS

Notes from the AAAP mailbox: the NJ/PA-UFO Study group and the "UFO Book Club" invites all to the "1990 Scientific Study of UFOs", to be held on December 1st, and 2nd, 1990, at the Holoday Inn on Route 206 in Bordentown, NJ. They have invited as speakers all the Great Northeastern Mutual UFO Newtork State Directors. Price is $55.00 before November 1st or $75.00 after that. Call Pat Marcattillo at 609-888-1358 between 11:00 A.M. and 2:00 P.M. for more details and registration.

Another item is Stan Polczk's Starrise and Starset Guild, a convenient, easy way to estimate the time stars rise and set. Advanced calculations are not required; use any planisphere (rotating star chart). Included are timetables for all northern and southern latitudes, this is a paperback with 64 pages. Special introductory price is $5.00, plus $1.00 for shipping. If your are a NJ resident, add the 7% sales tax. Send to Stan Polczk, PO Box 384, Keasbey, NJ 08832-0384.

Next item: The Association of Binary Star Observers, an association to bring together amateur astronomers interested in the study of visual binaries. Their purpose: 1. provide new members new to double star work with information on how



See us on the Web: www.princetonastronomy.org

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Amateur Astronomers
Association of Princeton
PO Box 2017
Princeton, NJ 08543