

SIDEREAL TIMES

*The Official Publication of the
Amateur Astronomers Association of Princeton*

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Number 9

From the Director

It's Saturday, October 2nd as I'm writing this. Last night I was out at the observatory for a short time. It was magnificently clear after all that rain we had in the last week. We could even see some of the Milky Way above us. There were few visitors there. A cub scout troop had come through, after that there were several others. I thought it interesting that one visitor had brought a schedule of when satellites would pass overhead, so for a time, there was satellite gazing as opposed to star gazing. There is always something to see as we look up and it continues to amaze.

In the news lately is the "potentially habitable" planet found around Gliese 581, which is only 20 light years away. Surprising? Not really. Exciting? Definitely. Why? Because it expands the possibility of human endeavor and adds to human knowledge. The thought that we are probably only one world society amongst many is an exciting one. It gives a target for exploration. Just as technology has developed in order to detect these other planets, so over time, will technology develop to actually travel to other worlds? Probably not in my lifetime, but soon I'm sure.

STARQUEST

October 8th to 10th
Hope Conference Center

Also in the news is periodic Comet 103P/Hartley 2 which should be visible through telescopes and binoculars this month. So look up a finder chart and see if you can see it. According to the news articles, it has its closest approach to earth since it was discovered in 1986.

Our first meeting on September 14th was well attended. The topic of neutron detectors as used in deep sea oil drilling and its applications to space science missions was very interesting. The next meeting will be on October 12th at 8 PM and our guest is Suzanne Staggs from Princeton University.

StarQuest is October 8th to 10th. As of this writing, the weather prediction is for clear skies for at least one evening. So I hope to see many of you there and we'll report on the outcome at our next meeting. See you all on October 12th, if not sooner.

Ludovico D'Angelo, Director

October Meeting

Our speaker for the October 12th meeting of the AAAP will be Dr. Suzanne Staggs of the Princeton University Physics Department. She will be speaking on the subject of cosmology, in particular the cosmic microwave background.



Dr. Staggs graduated from Rice University in 1987. In 1993, she received a Ph.D. from Princeton University with a dissertation on a long-wavelength measurement of the absolute temperature of the cosmic microwave background (CMB) radiation, with David Wilkinson. In 1994, she accepted an Enrico Fermi Fellowship at the University of Chicago, and then continued at Chicago for the next

two years as a Hubble Fellow, with more work on the CMB, constraining the amplitude of any spectral distortions from the blackbody curve. She also spent ten Saturdays in 1996 lecturing on cosmology to the general public as Compton Lecturer. In 1996 she returned to Princeton University as a faculty member. She received tenure in 2001 and is now a professor of physics. At Princeton, she began work on an experiment to measure the polarization of the CMB for which she received a NIST Precision Measurement Grant in 1998. That same year, she was selected as an Alfred P. Sloan Research Fellow. In 2000, she received an NSF CAREER award for a related multi-channel, multi-frequency CMB polarimetry experiment. She continues work on CMB polarimetry, and on the fine-scale primordial and secondary anisotropies of the CMB. At present she leads the camera development for the large, special-purpose, millimeter-wave telescope in the high Chilean Andes known as ACT, and is closely involved with two large projects aimed at measuring the primordial signatures imprinted in the CMB polarization by gravitational waves released in the first fractions of a second of the universe.

In 2004, Dr. Staggs received the Maria Goeppert Award from the American Physical Society for her original and lasting contributions to experimental cosmology, in particular in the area of cosmic microwave background studies, and for leadership in multi-institutional collaborations to measure CMB anisotropy.

For more about Dr. Staggs and her research, please see: <http://www.princeton.edu/physics/people/faculty/suzanne-staggs>.

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 noon on Oct. 12th so that a table can be reserved.

John Church, Program Chair

From the Program Chair

The program lineup for the 2010-11 club season is nearing completion. In September, Joel Groves of the Schlumberger Princeton Technology Center gave us a fine talk on the application of oilfield technology to detecting subsurface materials on asteroids and planets. For October 12, we will have Suzanne Staggs of the Princeton Physics Department to speak on cosmology (see separate article in this issue). Then for November 9, a special 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."

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, and 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 will await the speaker's determination of the springtime academic schedule.

March and May are still open as of this writing. On April 12 we will be treated to Michael Molnar speaking 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 superb treat!

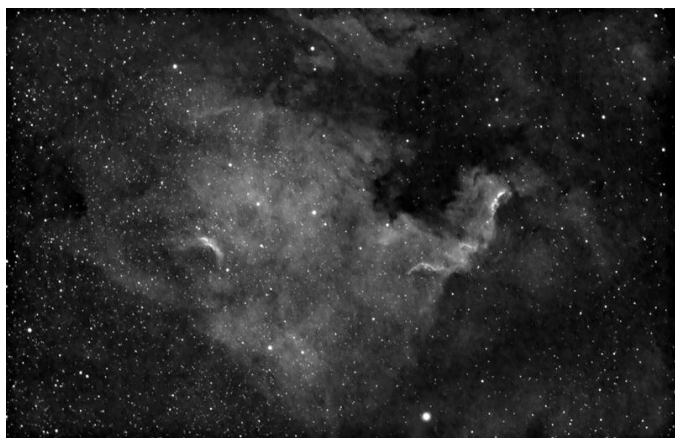
John Church, Program Chair

The deadline for the November Sidereal Times is Friday, October 29, 2010

Please submit articles to:

editors@princetonastronomy.org

Picture This – NGC7000



I haven't been doing my monthly Sidereal Times articles as I have been busy with a son going off to college and other family obligations. I was able to get some time in on a wide field object, NGC7000 also known as the North American Nebula. This large but dim nebula is just off Deneb in the constellation Cygnus at a distance of some 1.6k ly. The image was taken through an H-alpha filter (hence the B/W image) because of the light pollution in my area which would not allow me to capture this object, not to mention the Moon being past first quarter. My equipment was a WO SD66mm refractor using a WO 0.8xFR/FF to yield a FL of 310mm. The camera was a modified Canon XSI. Total time was 2 ½ hours using 5 min subs.

Brian Van Liew

Treasurer's Report

We are still early in our fiscal year, which began on July 1. Nine members have paid their 2010-11 dues. Observatory and lecture expenses have been modest thus far.

At this date, \$505 in StarQuest payments has been received. Because we have neither all payments nor any of the expenses, it is too early to say anything about StarQuest's financial outcome. So far this year – counting the StarQuest payments in revenue but having no expenses – the Association shows a surplus of \$436. Our cumulative surplus is \$18,774.

If you have not already done so, kindly send in your \$40 dues payments to:

Amateur Astronomers Association of Princeton
P.O. Box 2017
Princeton, NJ 08543

Michael Mitrano, Treasurer

Board of Directors Meeting September 9, 2010

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

Program Chair – John Church reported on the speaker schedule for the upcoming year. Guest speakers have been set for the months of September, October, December, January, and a tentative speaker is set for February. John announced that member Michael Wright has agreed to serve on the Program Committee. John raised the issue of the pre-meeting dinners and noted that the Sotto Restaurant is now a sports bar and is very noisy. He indicated that attendance by club members has been low for previous dinners.

Observatory Report – A discussion was held concerning parking by the public at the observatory and the problem that arises if they park on the grass beside the road. It was agreed that the use of the orange cones that Gene Ramsey purchased should resolve the problem. Gene and John Church announced that they repaired the vent that was broken by vandals. The prospect of upgrading the observatory alarm system was held and will be investigated further. The tracking drive on the refractor is not working and needs to be repaired or replaced. Gene suggested that we remove the briar bushes from around the gate to the observatory.

Publicity Chair – Ludy suggested that the Program Committee be responsible for doing the club's publicity. Michael Wright will perform these duties as part of the committee. Ludy still has his list of publications and will give them to Michael.

Secretary's Report – The count of new members and the email list were discussed.

Treasurer's Report – Michael Mitrano stated that there has been no activity since the last report.

Outreach – Bill Murray announced that Super Science Saturday will be held on April 16, from noon to 4:00 pm. Next year there will be a lot of space related activities at the State Museum, some commemorating the 50th anniversary of man in space. In July there will be a large exhibit of the Cassini Mission with related planetarium shows. In conjunction with these events will be activities at our observatory on public nights. Gene met a high school teacher who asked that we let her bring her class to our observatory. It was noted that we should ask the teacher if her school could donate something. Member Dee Bosch asked if we could do a star party for her in Pemberton. She also asked for assistance in operating her Meade 127 ETX telescope.

StarQuest - Ludy spoke with the people from Hope responsible for the conference center and came to an understanding concerning the weather. He asked for volunteers to help in the kitchen and several in attendance agreed to help.

The next board meeting will be Thursday, November 4 at 7:30 pm.

Larry Kane, Secretary

STS-133 Preview: Rolling and Hoisting Discovery for Final Flight

Launch preparations for what is truly the final scheduled flight of Space Shuttle Discovery kicked into high gear in the early morning hours of 9 Sept. 2010 when NASA's oldest orbiter was rolled a few hundred meters from Orbiter Processing Facility 3 (OPF-3) to the Vehicle Assembly Building (VAB) at the Kennedy Space Center (KSC) – an awesome sight to behold !

Later that evening, a multi-day process began to hoist and mate Discovery for the very last time to an external fuel tank (ET) and twin solid rocket boosters (SRB's) which will power the majestic orbiter skywards for her final journey to space on the STS-133 mission. At the conclusion of the STS-133 assembly flight to the ISS, Discovery will be retired.

These events are simultaneously joyous and bittersweet for all the NASA shuttle workers and managers at KSC and across the US. From top to bottom, there is a palpable and overwhelming sense of both great pride – in magnificent accomplishments - and utter sadness, at a premature program termination. I was exceedingly privileged to attend all these breathtakingly beautiful events representing Spaceflight Magazine & The Planetary Society

Along with literally just a handful of other very fortunate media reps, NASA granted me extraordinary and ultra rare access to the highly restricted inner workings of shuttle launch processing activities inside the VAB to document the finale of the shuttle program. I was present to observe and photograph the carefully choreographed "lift and mate" operations up close from multiple angles and levels inside the VAB.

The unforgettable sequence began with Discovery's short trip atop a 76-wheeled transporter at 6:55 AM (Sept. 9) as she was backed tail first out of OPF-3. The trip from OPF-3 to the VAB is dubbed a 'rollover' and marks the start of the final stage of launch preparations for STS-133.

Hundreds of KSC and contractor employees who actively processed Discovery for flight were invited to gather and observe the event along with journalists and photographers like myself who documented the entire course of the stunning proceedings. Most KSC employees never get the chance to glimpse the orbiters up close.

The orbiter was parked at one point so revolving groups of the employees could pose for photo ops with Discovery. They unfurled a long banner which read – We're Behind You Discovery – signed by all who worked on this particular mission. Discovery was then hauled inside the VAB. The trip lasted four hours.

At a snail's pace, Discovery was then hoisted by crane operators towards the 52-story VAB roof and moved laterally on the 16th level into the High Bay where the ET and SRB's had already been assembled and stacked on top of the Mobile Launch Platform (MLP). Our media group and NASA escorts watched this entire operation in total awe from the 16th level as Discovery passed by us just meters away. Discovery was then lowered into place.

STS-133 is set for a Nov. 1 launch at 4:40 PM EDT from KSC with a crew of six for 11 days. Discovery will deliver the 'Leonardo' module packed with supplies and critical spare parts, as well as Robonaut 2 (R2) to the ISS.

I was thrilled to be on hand to witness these historic events. Check out my online articles with numerous photos at NASA Watch, The Planetary Society and my website below for complete details:

<http://www.spaceref.com/news/viewnews.html?id=1435>

<http://www.spaceref.com/news/viewnews.html?id=1436>

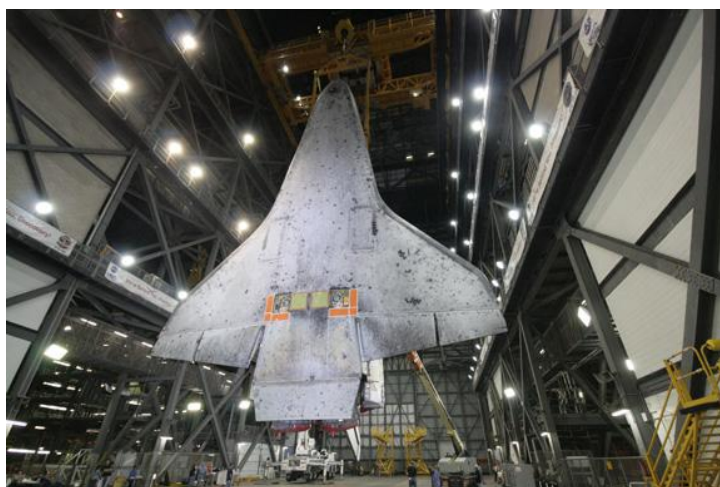
Ken Kremer



Ken Kremer and Discovery inside Vehicle Assembly Building at KSC. Credit: Ken Kremer



Ken Kremer with Discovery for rollover from OPF to VAB (left). Credit: Larry Sullivan



Full belly view of Spaceship Discovery coated with thousands of protective heat shield tiles. Credit: Ken Kremer



Close-up of nose and crew cabin of Discovery, NASA oldest orbiter, during road trip at KSC on Sept. 9, 2010. Credit: Ken Kremer

Astronomy Outreach by Ken Kremer

At the AAAP January 2011 monthly meeting, I'll speak about my up close experiences at NASA & KSC with the Shuttle and the new Orion capsule; and at Cape Canaveral with SpaceX inspecting the new Dragon capsule & Falcon 9 rocket.

Stella Della Valley Star Party & Bucks-Mont Astronomical Association (BMAA): Ottsville, PA, Oct 9, Sat, 3 PM. *"The Space Shuttle, The Space Station and What's Beyond for NASA with Orion & Falcon 9."* Website:

<http://www.bma2.org/Sdv.html>

Rittenhouse Astronomical Society (RAS) at the Franklin Institute: Philadelphia, PA, Oct 13, Wed, 8 PM. *"The Space Shuttle, The Space Station and What's Beyond for NASA with Orion & Falcon 9."* Website:

<http://www.rittenhouseastronomicalsociety.org>

Plantation Astronomy Club: Leesburg, Florida, Nov 15, 7 PM. *"What's Beyond for NASA with Orion & Falcon 9"*.

Website: <http://www.palhoa.com/id103.html>

Washington Crossing State Park: Titusville NJ, Nov 21, Sun 1 PM. *"6 Years of Mars Rovers (in 3-D)"*

Gloucester County College Astronomy Club: Sewell, NJ, Dec 7, 7:30 PM. *"6 Years of Mars Rovers and the Search for Life (in 3-D)"* Website:

http://www.gccnj.edu/news_and_alerts/rotating_ads/ken_kremer.cfm

Twenty Years Ago in Sidereal Times

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Amateur Astronomy Association of Princeton

Director: Larry Smith

Editor: JWHS

OCTOBER 1990

PRE-MEETING NOTES

ARE YOU READY, MEMBERS? Our October 9th guest speaker will be none other than Dr. J. Richard Gott III, "cosmologist extraordinaire" of Princeton University, who will speak to us on Einstein's General Relativity. A brief bio: Dr. Gott got his degree summa cum laude from Harvard in 1969; recieved his Doctorate from Princeton in 1973; did post-grad work at Cal Tech and Cambridge; recieved the Sloan Award; and in 1975 recieved the Trumpler Award for his contributions to astronomy. And at the end of the meeting, both Peyton Hall refracors will be available for use, if the weather cooperates.

And next month, Dr. Freeman Dyson of The Institute for Advanced Study will speak to us on comets.

AN IMPORTANT NOTE: due to prospective attendees' inability to fit this trip in, the NASA-GODDARD TRIP HAS BEEN CANCELLED. [I've left Jay Albert's article in on the next page as it contains information that will be of interest to members---ED]

There will be no pre-meeting dinner at The Tiger's Tale this month.

-Vic Belanger

COMET LEVY: WHAT COMET AUSTIN SHOULD HAVE BEEN

A violent but very brief electrical storm passed through Mercer and Hunterdon counties Monday afternoon, August 27. This was followed by a front of high pressure which resulted in the clearest, darkest skies I have experienced since moving to the area. After the moon had set (10:00 PM), I brought out my 4-inch SCT and spent several hours observing and photographing Comet Levy, 1990c. The comet was well-placed in the southern sky between Aquila and Capricornus and projections of magnitude 3.5-4 were made in SKY & TEL for this date. I would estimage that the magnitude of the comet was at least 3.5 as it was visible by naked eye and

was clearly defined in 7x35 binoculars. At 37x, my telescope revealed an intensely bright nucleus and a short but visible tail which was about 30 minutes of arc in length. Photographically, the tail was closer to one degree in length (3 minutes exposure at f/1.8 with Konica 3200 film). This comet was a very pleasant surprise and is the brightest I have seen since Halley. During September the comet approaches the horizon and becomes difficult to see, but will be well-placed for observers in the Southern Hemisphere.

-John Zysk

FIELD TRIPS

The next scheduled AAAP field trip is to the NASA Goddard Space Flight Center in Greenbelt, Maryland (before you get to Washington) on Saturday, April 14th. We'll meet at the Visitor's Center at 12:30 P.M. and our group tour will start at 1:00 P.M. That evening we will join members of the local astronomy club for an on-site star party. There is a maximum of 40 people to a group, so I'll need a headcount. Sign-up sheets will be circulated at the beginning of the next AAAP meeting. If you can't make the meeting but would like to make the trip, please call me evenings after 7:00 P.M. at (609)443-6191.

The Goddard Space Flight Center is a key facility for many space-related programs. Much of the forthcoming space station is being designed here. It is a critical center for ground-to-space communications for both manned and robotic space flights. It is also the control center for the Hubble Space telescope and such other missions as the Cosmic Background Explorer and future gamma and x-ray observatories.

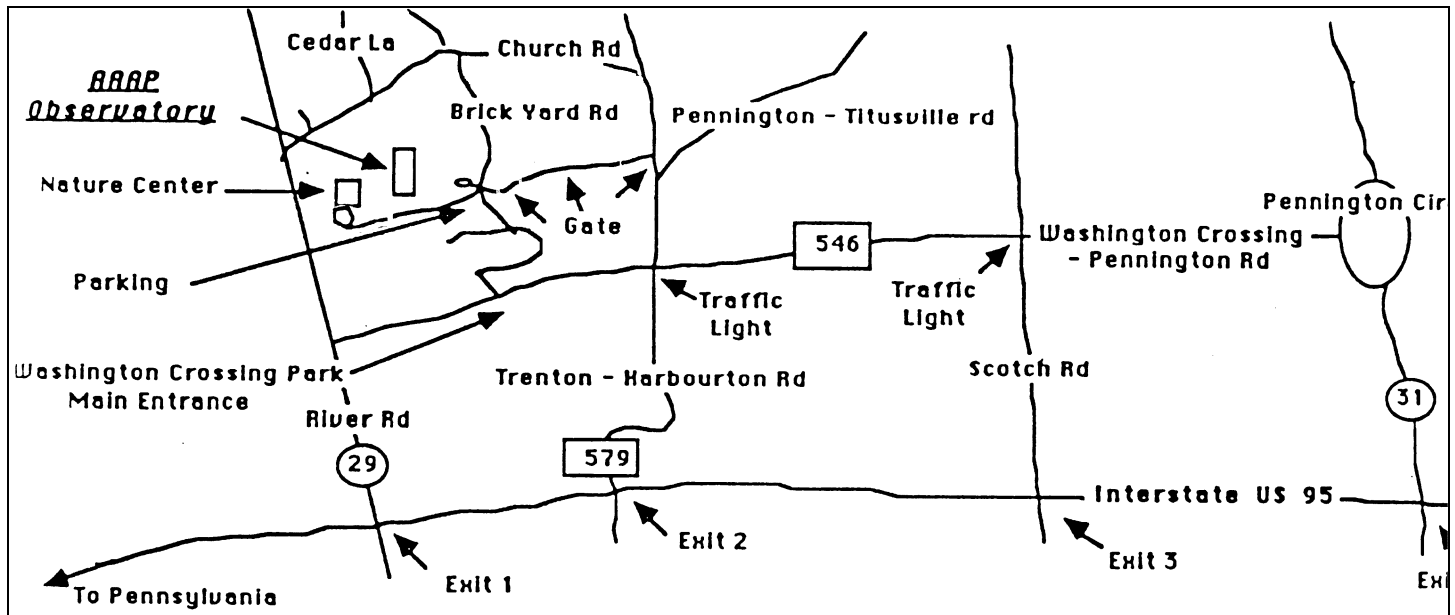
Getting there is simple. Take I-95 to the Baltimore-Washington Parkway. Take the Parkway north to Route 193 east. Remain on Route 193 for 2 miles and the facility will be on your left. See you there!

-Jay Albert

FROM THE TREASURER

The Treasury balance stands at \$2,059.31. I've finally received the T-shirts ordered last June. I now have a supply in all the styles, but most are in large and extra-large size..

Directions to Simpson Observatory



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 (right). At the third traffic light, make a left onto the Washington Crossing-Pennington Road (County Route 546). Take CR546 to the first traffic light and make a right onto Trenton-Harbourton Road (County Route 579). Take CR579 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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