

SIDEREAL TIMES

The Official Publication of the
Amateur Astronomers Association of Princeton

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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

Over the last few weeks my time for observing has been very limited due to job commitments so I have tried to fit in some brief but unusual observing sessions. One thing I have tried to do is observe passes of the International Space Station. In mid-January these occurred in the early evening after sunset and they only last a few minutes so they fit my schedule. If you're interested in doing this I recommend the "Heavens Above" website (<http://www.heavens-above.com>). This site shows a graphic of the ISS's current position above the Earth and you can tailor it to give predictions of ISS passes over the next weeks for your location. On Friday, January 15th "Heavens Above" predicted an ISS pass at 6 PM with a maximum altitude of 75° (virtually overhead) and a maximum magnitude of -3.5 (brighter than Venus). I arrived home from work with a few minutes to spare and went out into my backyard to observe the pass. The ISS appeared right on schedule and was spectacularly bright when it was overhead. It even appeared to me that the space station was not a point source of light like a star but had some angular extent. Next month the space shuttle mission STS-130 will launch and bring Node 3, one of the last major elements in its construction, to the ISS. This will make the station about 90% complete and even brighter than it was before. Hopefully there will be some early evening passes with the space shuttle attached to the station.

At the January meeting we finally achieved the necessary quorum in the vote on the bylaws changes proposed in September. The changes have been approved. My thanks go out to all members who voted on this issue.

The deadline for the March issue is:

Friday, February 26, 2010

Send your submissions to:

editors@princetonastronomy.org

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 February 9th at 8 PM at Peyton Hall. The speaker will be Professor Michael A. Strauss of Princeton. The title of his talk is "Mapping the Universe".

Till then, keep warm.

Bill Murray, Director

Membership Meeting Minutes January 12, 2009

The meeting was called to order by Director Bill Murray

1. He announced that we now have speakers for every meeting except March. The Director presented observatory keys to our two new key-holders, Allen Nodes and Dan Reynolds. Bill announced that as of this meeting, we have sixty two paid members. Therefore with the twenty six votes filed in favor of revising the AAAP by-laws, they are revised.
2. Assistant Director John Church stated that he visited the Princeton Astrophysics Department and got two people to serve as speakers for our monthly meetings.
3. Treasurer's Report: Treasurer, Michael Mitrano gave his report which appears in another section of this edition of Sidereal Times.
4. Observatory Report: Co-Chair, Gene Ramsey announced that the repairs made to the observatory roof now provide more clearance for expansion due to the ice and snow. He also stated that with the new key-holders, he and co-chair Larry Kane can now develop new key-holder assignments for the Spring.
5. Outreach Report: The AAAP will be at the Lawrenceville School on Friday, January 29. At this time, this is our only outreach commitment.
6. Sidereal Times: The deadline for the next edition is Friday, January 29.
7. Old Business: StarQuest will be held in October this year.
8. New Business: Rex Parker reported on the availability of software which contains the US Naval Observatory Ephemeris. It is published by Willmann-Bell.
9. The Director adjourned the meeting.

Larry Kane, Secretary

Community Outreach

On Friday January 29th, John Giles, Larry Kane, John Miller and I hosted a star party for Lawrenceville Elementary School. This was their annual Science and Discovery night. It was quite frigid, but the sky was surprisingly clear. Favorite targets included the moon, Mars, the Orion Nebula, and the Pleiades. John Giles and I each manned scopes outdoors, while Larry ran the show inside. John Miller acted as photographer. It's hard to estimate, but I would guess that there were no fewer than 150 students and their parents.

Our upcoming calendar is currently clear, but as always, if you want to be involved in future events, please let me know by emailing me at _____ or calling me at _____

Jeff Bernardis, Outreach Coordinator

Interested in keyholder training?

or

Treasurer's Report

Dues for the current fiscal year remain at \$2,480 (62 members). Total revenue from all sources is about \$2,700 for fiscal year to date.

The observatory insurance policy is paid each January. With that expense, the Association has moved into the red. For the fiscal year that began on July 1, expenses now exceed revenue by about \$650.

The Association's cumulative surplus is now about \$17,500.

Michael Mitrano, Treasurer

February's Program

Our guest speaker for February is **Michael A. Strauss**, Professor of Astrophysical Sciences and Associate Chair, Department of Astrophysical Sciences here at Princeton. His talk is titled, "Mapping the Universe."



Michael earned his undergraduate degree and Ph.D from UC Berkeley. His interests include all aspects of extragalactic astronomy and observational cosmology. He has used large surveys such as IRAS and the Sloan Digital Sky Survey, to study the large-scale distribution of galaxies to constrain cosmological parameters, the relationship between galaxy properties and their environment, and the nature and evolution of AGN and quasars. Strauss has published over 200 papers in the scientific refereed literature on subjects ranging from the large-scale distribution of galaxies to the discovery of the most distant quasars known.

There will be a pre-meeting dinner at the Triumph Brew Pub starting at 6 PM. Please contact John Church at _____ no later than Monday, February 8 if you plan to attend.

Other News...

Giant Ribbon at Edge of the Solar System: Mystery Solved?

Last year, when NASA's IBEX (Interstellar Boundary Explorer) spacecraft discovered a giant ribbon at the edge of the solar system, researchers were mystified. They called it a "shocking result" and puzzled over its origin. Now the mystery may have been solved.

"We believe the ribbon is a reflection," says Jacob Heerikhuisen, a NASA Heliophysics Guest Investigator from the University of Alabama in Huntsville. "It is where solar wind particles heading out into interstellar space are reflected back into the solar system by a galactic magnetic field." Heerikhuisen is the lead author of a paper reporting the results in the Jan. 10th edition of the *Astrophysical Journal Letters*. "This is an important finding," says Arik Posner, IBEX program scientist at NASA Headquarters. "Interstellar space just beyond the edge of the solar system is mostly unexplored territory. Now we know, there could be a strong, well-organized magnetic field sitting right on our doorstep."

The IBEX data fit in nicely with recent results from Voyager. Voyager 1 and 2 are near the edge of the solar system and they also have sensed strong magnetism nearby. Voyager measurements are relatively local to the spacecraft, however. IBEX is filling in the "big picture." The ribbon it sees is vast and stretches almost all the way across the sky, suggesting that the magnetic field behind it must be equally vast.

Although maps of the ribbon seem to show a luminous body, the ribbon emits no light. Instead, it makes itself known via particles called "energetic neutral atoms" (ENAs)--mainly garden-variety hydrogen atoms. The ribbon emits these particles, which are picked up by IBEX in Earth orbit.

The reflection process posited by Heerikhuisen *et al.* is a bit complicated, involving multiple "charge exchange" reactions between protons and hydrogen atoms. The upshot, however, is simple. Particles from the solar wind that escape the solar system are met ~100 astronomical units (~15 billion kilometers) away by an interstellar magnetic field. Magnetic forces intercept the escaping particles and sling them right back where they came from.

"If this mechanism is correct--and not everyone agrees--then the shape of the ribbon is telling us a lot about the orientation of the magnetic field in our corner of the Milky Way galaxy," notes Heerikhuisen. And upon this field, the future may hinge.

The solar system is passing through a region of the Milky Way filled with cosmic rays and interstellar clouds. The magnetic field of our own sun, inflated by the solar wind into a bubble called the "heliosphere," substantially protects us from these things. However, the bubble itself is vulnerable to external fields. A strong magnetic field just outside the solar system could press against the heliosphere and interact with it in unknown ways. Will this strengthen our natural shielding--or weaken it? No one can say. "IBEX will monitor the ribbon closely in the months and years ahead," says Posner. "We could see the shape of the ribbon change--and that would show us how we are interacting with the galaxy beyond."

To view this article and the accompanying visual representations go to http://science.nasa.gov/headlines/y2010/15jan_ibex2.htm.

Submitted by Bryan Hubbard

20 Years Ago In Sidereal Times...

SIDEREAL TIMES

Newsletter of the Amateur Astronomers Association of Princeton, Inc.

DIRECTOR: Larry Smith

FEBRUARY 1990

EDITOR: JWHS

The February meeting of the AAAP will be held on the usual date and at the usual time. That is: the second Tuesday of the month, February 13, at 8:00 PM. However, the meeting will NOT TAKE PLACE AT PEYTON HALL. It WILL take place at the PPPL Auditorium (Princeton Plasma Physics Laboratory).

The program for this meeting is "The Heavens on Earth". Come hear how man is attempting to control the very fire of the stars to generate a limitless source of energy. The lecture will be given by Don Monticello, a PPPL scientist and club member. A tour will be given of a device, TFTR, that is close to achieving the feat of limitless energy. The tour will be presented by PPPL scientist and club member Pat Colestock. PLEASE DO NOT WEAR HIGH-HEELED SHOES, OPEN-TOED SHOES, OR SANDALS. People with pacemakers and children under 10 years of age will NOT be allowed on the tour, but are invited to the lecture.

TO GET TO THE PPPL AUDITORIUM: If you are going north on US Route 1, take the first exit after Scudders Mill Road. Proceed until you come to a guard booth; then take a left around the guard booth, and follow the road for about 1 mile to the second guard booth; and from there, proceed to the parking lot on your right. The Auditorium is on your left.

If you are going south on US Route 1, take the first exit after College Road. Follow the exit around and under US Route 1 until you come to a guard booth; then take a left around the guard booth, and follow the road for about 1 mile to the second guard booth. From there, proceed to the parking lot on your right, and the Auditorium is on your left.

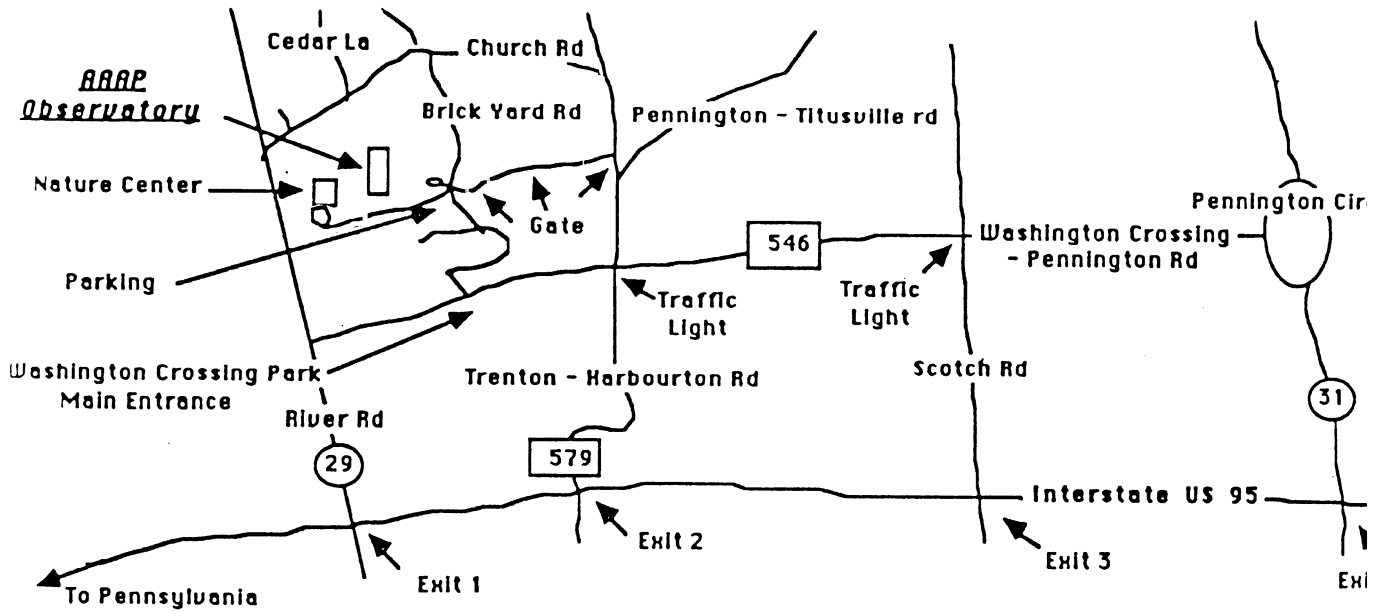
[A MAP IS ON THE NEXT PAGE]

FROM THE EDITOR

A brief note. Note that this month's issue of the Times is a bit shorter than in some previous months, due to fewer submissions. Don't forget, people, that WE'RE ALWAYS READY to read about: 1. your observations; 2. your special methods of observing; 3. your "road trips"; and 4. ANYTHING ASTRONOMICAL! So---KEEP YOUR SUBMISSIONS COMING!

On astrophotography: sorry the scheduled session---the first one, that is---was clouded out. But Bill and I will arrange another session soon. And I'm hoping that any interested parties will attend. And that's especially IMPORTANT, due to the soon-to-arrive Comet Austin, which COULD BE THE BRIGHTEST ONE OF THIS CENTURY!!! We'll talk about this at the meeting.

-JWHS



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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