ATM BOSTON inc.

STAR FIELDS

Newsletter of the Amateur Telescope Makers of Boston
Including the Bond Astronomical Club
Established in 1934
In the Interest of Telescope Making & Using

Vol. 12, No. 9 October 2001

This Month's Meeting...

Thursday, October 11th, 2001, at 8:00 PM
Phillips Auditorium, Harvard-Smithsonian
Center for Astrophysics

This Month's Speaker...

OUR GUEST speaker will be Dr. Bryan Gaensler, who recently joined the Harvard-Smithsonian Center for Astrophysics where he is the Clay Postdoctoral Fellow. He obtained his Ph.D. from the University of Sydney in 1998, and subsequently worked for three years in the Center for Space Research at MIT. His research interests focus on radio and X-ray observations of neutron stars, supernova remnants and the interstellar medium. Dr Gaensler was the 1999 Young Australian of the Year, and gave the 2001 Australia Day address to the nation. The suggested title of his talk: "Champagne Supernova in the Sky".

Join us for dinner at 5:45 PM at the Changsho Restaurant located at 1712 Mass Ave. in our fair city, Cambridge.

President's Message...

SEVERAL WEEKS have passed since the horrific events of September 11th and our pain associated with these horrific acts will surely remain with us for a long time. My thoughts go out to all those effected by this tragic event. During the healing process we have no choice but to be strong and to carry on.

This is the second year that I attended Arunah Hill Days sponsored by the Arunah Hill Natural Science Center located in Cummington, MA. Friday night was cloudy, but Saturday night was absolutely spectacular. Observing went well into the early hours. John Davis, who is a skilled and knowledgeable observer, pointed out the Veil Nebula to me in a commercially made 8" Dobsonian. The number of homebuilt telescopes present at this event was impressive. One fellow built a 12.5" classical Cassegrain (concave parabolic primary and convex hyperbolic secondary) using the prescription described in exquisite detail in the 2nd edition of "How To Make a Telescope" by Jean Texereau. I have always been intrigued by the design but never had the chance to look through an equivalent system. Viewing through this system was breathtaking! The stars were perfect pinpoints of lights. With the system's long effective focal length, a 32mm eyepiece was yielding powers above 200x with excellent eye relief. Another amazing feature about this telescope was that it was attached to an equatorial mount fabricated from 1½" pipe fittings. I believe the pipe mount design was gleaned from Sam Brown's book entitled "All About Telescopes", where a short chapter is dedicated to low cost solutions for equatorially mounting your telescope. The polar shaft, made from steel pipe, rotated in the brass bearing so smoothly that my first impression was that the mount was commercially made.

DAN FELDKHUN has started a CCD camera building workshop on Thursday nights at the clubhouse. At one point last Thursday we counted 21 people present for various activities. Hope to see you there. ***-Bob Collara, President-***

Executive Board Meeting...

THERE WILL be an Executive Board meeting on October 21st at the clubhouse starting at 6:00pm. ***-Bob Collara, President-***

September's Minutes...

PRESIDENT BOB COLLARA opened September's meeting of the Amateur Telescope Makers of Boston, including the Bond Astronomical Club. Bob called for a moment of silence to honor those who died on September 11th. Bob asked if there was interest in having an observing camping trip next summer at Baxter State Park, and there was.

Our guest speaker was Dr. Avi Loeb, professor at Harvard University's Department of Astronomy and a member of the Theoretical Astrophysics Division of the Harvard-Smithsonian Center for Astrophysics. He talked about the formation of the very first stars in the universe. The universe started uniform. It had the same density everywhere, except there were small ripples or fluctuations on top of this uniform density, so it wasn't perfectly uniform. Similar to sound waves traveling through the air in a room, there are small fluctuations in the mean density of the air. The ripples in the universe were generated by processes related to quantum mechanics early on. The ripples grew as a function of time. Regions that were slightly denser than average became more and more dense as time went on because of the unstable nature of gravity. So regions that were slightly denser than average became locally they are part of a closed universe, a universe that is denser than the critical density necessary to make it collapse. Regions that were under dense became more and more under dense as time went on. The density of the dense regions became denser, and the densities of the under dense regions became less dense. Eventually bound objects formed. Regions collapsed upon themselves and formed objects like galaxies. A bound object, like a galaxy, came from a region that initially were slightly denser than the average but eventually collapsed upon itself just because it was denser than the critical density necessary for it to collapse upon itself. The galaxies are separated by big voids from where the mass was drained into these collapsed objects. This is how the universe became fragmented. It is true on small scales for on small scales there is fragmentation - small lumps of matter. On large enough scales the fragmentation did not

occur yet. At a large scale the universe appears to be at the mean density, uniform more or less even today.

After the Big Bang the universe expanded. As the universe expanded it cooled, just as when a gas expands it cools. At some point the temperature dropped below a few thousand degrees Kelvin (approximately the temperature of a candle flame), and as the temperature continued to drop, hydrogen formed out of the free electrons and protons. Free electrons scatter light very easily. However, the hydrogen atom is neutral and cannot interact very effectively with light. Suddenly the radiation which filled the universe was able to stream freely. We see it today as the relic background microwave radiation. The universe, which previously was like a dense fog, became transparent.

At about 100 million years the first stars formed because objects collapsed. The stars radiated a lot of energy and re-ionized the universe: they broke all of the hydrogen atoms that existed back into electrons and protons. Today most of the universe is ionized. There is very little neutral hydrogen. Current observations using 10-meter class telescopes are starting to probe the hydrogen reionization epoch.

At the business meeting club officers gave their reports. Membership Secretary JOHN SMALL announced that there are about 360 members, although not everyone has yet re-paid their dues. Clubhouse Director PAUL CICCHETTI announced that the barn roof is now completed. JOHN REED announced that BRUCE GERHARD's wife Sylvia passed away on September 9th. She worked as a librarian for the Canton Public Library, for the Mass. Hospital School in Canton, and for the New England Sinai Hospital in Stoughton. DAN FELDKHUN has started a CCD making workshop at the clubhouse. Members are free to work on individual projects at the workshops. MARIO MOTTA announced that we will be celebrating the 50 years that ED KNIGHT has been a member of ATMoB at a "surprise" party in November. Everyone is encouraged to recall and retell some good stories for a lively "roasting" of Ed.

TAL MENTALL requested that the lights be kept dim after the guest speaker's talk, and they were. MARIO MOTTA announced that the 90th annual meeting of the AAVSO (American Association of Variable Star Observers) will be held November 1-3 at the Holiday Inn in Somerville, MA. The program is as follows: Thursday, Nov. 1st – Dinner and Open House at the AAVSO headquarters; Friday, Nov 2nd – Precision CCD Photometry Workshop (9-3) – improve or learn CCD skills; scientific paper sessions; Friday evening guest speaker will be Professor Robert Kirshner and his talk will be "Tremendously Varying Stars and the Accelerating Universe"; Saturday, Nov. 3rd – membership meeting (learn what the AAVSO does), scientific paper sessions, banquet. CHARLIE MCDONALD displayed the Reading Post Office award he received for his work in astronomy at the Reading schools. ***-Eileen Myers, Secretary-***

Membership Report...

WE HAVE 228 members who have renewed as of the September cut off date. That means that 127 of you have not renewed. You all know how much I hate sending out the "Friendly Reminders" and "Termination" notices, so I would appreciate your sending in your dues and making that part of the job unnecessary.

I announced that I would not be running for Membership Secretary this year, and I that needed someone to take over the position. The response has been underwhelming to my request. I will be happy to assist the new Secretary in taking over and make sure the transition is smooth and orderly and not dumped on the new person, but I still need to get some people to come forward to talk about it.

We have two new members this month: STEVE WALKER from Cambridge, MA and DAVID VALLELI from Billerica, MA. Please give them a warm ATMoB welcome.

-John Small, Membership Secretary-

Treasurer's Report...

FOR THE month of August we had $6,819.08 in revenue and $87.88 in expenses for a net gain of $6731.20 for the month.

As of August 31st, 2001 our assets were:

Checking Account - Regular	$ 18,785.19
Investments	$ 19,006.66
Total Current Assets	$ 37,791.85

Of the total, $2,537.56 is in the Land Fund and $160.00 is for clubhouse key deposits. ***-Bernie Volz, Treasurer-***

Clubhouse Report...

SATURDAY OPEN CLUBHOUSE SCHEDULE

October 6		**Work Party # 9**
October 6	Peter Psyhos	David Richardson
October 12-13		**Astro Assembly**
October 13	Steve Herzberg	John Panaswich
October 20	**Trip to NYC**	**Planetarium**
October 20	Phil Rounseville	Art Swedlow
October 27	Paul Cicchetti	Dave Prowten
November 3		**Work Party # 10**
November 3	Dan Feldkhun	John Small
November 10	Richard Burrier	Henry Hopkinson
November 17	Bruce Berger	Eileen Myers
November 24	Bruce Gerhard	John Reed

WORK CONTINUED on the Knight Observatory. Stiffeners were added to the vertical and horizontal beams of the outrigger. A horizontal cap plate was added to the top of the entire length of the two rail beams after the horizontal "x" brace was installed. The net result is a much sturdier structure to support the roof when in the open position. Work continued on painting the meeting room and refurbishing the electronics room. Electrical conduit was loosened from the ceiling and 2/3rds of the fire board was installed on the basement ceiling around the furnace. This week the refastened conduit will allow electrical hookup of the furnace to commence. At the next work party on October 6th the rest of the fire board will be installed. We have scheduled a 20-yard dumpster to be delivered on October 5th to allow us to remove the debris that has been accumulating since we started the barn roof project. We will need as much help as possible on October 6th for the observatory, furnace, and clean-up proje NOTE: When you arrive at the clubhouse for any activity, sure you enter your name into the sign-in log so that we can thank you for your participation.

During the month of October several VIP tours will be

coming to the Haystack Observatory. We have been requested to keep our grounds looking as neat as possible.

Thanks go to DAN FELDKHUN, BRUCE GERHARD, ED KNIGHT, JOHN PANASWICH, DAVE PROWTEN, JOHN REED, ART SWEDLOW, and SAI VALLABHA.

-Paul Cicchetti and John Reed, Clubhouse Directors-

Upcoming Star Parties...

THE LYNNFIELD Star Party is set for Monday, October 22nd at the Lynnfield Middle School. The rain date is Tuesday, October 23rd. I would appreciate about 10 volunteers. Please e-mail me if you can make it at mmotta@massmed.org, or call 781-334-3648. Thank you all. *-Mario Motta-*

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STEVE CLOUGHERTY will be running a star party at the Lincoln-Mystic School in Winchester, MA. It's scheduled for Thursday, October 25th with a rain night of Friday, the 26th. I suspect that it will be a 6:30 to 8:30 sort of night.

–Rich Nugent, Observing Committee-

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I therefore propose that we have a special dinner/gathering at a restaurant/function hall to honor and "roast" dear Ed. After checking on various venues, I have tentatively reserved the Chang Sho Restaurant for Tuesday, November 13th. I choose this site because most members are already familiar with the restaurant, and it is centrally located for members. Also the price was good compared to other function halls.

I now ask for a show of numbers to see how many will attend. With a maximum occupancy of 100 people, I estimate 50-75 will come. Please e-mail me during the next week or so, and let me know that you can attend, and include how many (e.g. significant other, etc.). I especially want to hear from those who know exactly why this is happening, and know Ed from way back. Come prepared with stories and anecdotes for a proper Roast of Ed Knight. The estimated cost will be $43/person, with a small additional amount for a gift. Please respond soon so I may finalize the site. I can be reached at mmotta@massmed.org or by mail at 806 Lowell St., Lynnfield MA 01940 *-Mario Motta, MD-*

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Enter competitions for Astrophotography, Telescope-making, and the Astro-Bake-off. Match your wits with others in the Astroquiz – this year on observing. Door prizes and raffles.

-Eileen Myers-

More People Needed For Oct. 20th Trip to Hayden Planetarium...

THE TRIP to visit the Hayden Planetarium and Museum of Natural History in NYC is all set for Saturday, October 20th. Like last year, there will be a pickup in the towns of Harvard, Billerica, and at the Riverside MBTA station. The cost will be under $100 for the day, and will include busfare, breakfast and dinner, admission to the museums, tour of the Rose Center, and Planetarium show. Individual arrangements can be made too. investigation of some of the restaurants in the area revealed that most could not accommodate a large group on a Saturday night, or they were too expensive. We will be having dinner at Gabriella's Mexican Restaurant, but at another location: 75th St. and Amsterdam Ave., where there is a party room. Most folks who ate at the Mexican restaurant last year enjoyed the food. There are many other restaurants nearby if you prefer to eat somewhere else. We will be eating between 5 and 6:30.

Please tell your neighbors and friends. Project Astro folks: tell your co-teachers. The bus still has room for 16 more. Email Eileen at starleen@ma.ultranet.com or call 978-456-3937. *–Eileen Myers, Secretary-*

Arunah Hill Days...

ARUNAH HILL Days were celebrated by ATMoB members BOB COLLARA, BARBARA BOSWORTH, JOHN REED, VLADIMIR VUDLER and TED POULOS. We were pleased to see the new road from the lower parking area to the hill top plus the just completed 800 sq. ft. pavilion that will provide visitors shelter from the hot sun and rain. A very active sun was observed through several solar scopes equipped with both visible light and H-alpha filters. Everyone was astounded by the number of prominences visible and the whole string of sunspots belting the sun. Boy Scouts constructed model rockets and fired them la the day. As usual, they also manned the food tent serv breakfast, lunch, and a roast beef BBQ dinner. Although it was a marginal weather weekend, it cleared nicely Saturday after the

evening raffle and talk much to the delight of observers who had many telescopes set up. To make finding Arunah Hill easier, John and I recorded some mileage and landmarks. From the Boston [illegible] take the Mass Pike to Rt. 91 N then to Rt. 9. West on Rt. 9 [illegible]27 miles to Windsor Town Line. Turn left at "Worthington-Peru to Rt. 143" sign. From where Rt. 112 crosses Rt. 9, this sign is 12.2 mi. Look for the red bridge crossing the Swift River at 6.5 mi. and another small bridge at 10.6 mi. Proceed 3 mi. on Worthington Rd. and turn left onto Trouble St. Arunah Hill entrance is 0.5 mi. on left. *-Ted Poulos-*

Wright Lectures on Cosmic Evolution...

HAVE YOU ever wondered about some of life's 'big' questions such as: Where did the universe come from? How did our solar system form? Why did intelligent life appear on Earth? Where will the next millennium take us? Well, look no further! The Museum of Science and the Wright Center for Science Education present the fifth biannual Wright Lectures on Cosmic Evolution. Please join us as some of the world's experts in astrophysics, chemistry, and evolutionary biology take us on a journey across the arrow of time, from big bang to humankind, over the course of the month of October. Programs take place on Wednesday evenings at 7:00PM at the Cahners Theater of the Museum of Science. Free tickets, thanks to the generosity of the Lowell Institute, are available beginning at 6:00PM at the registration table in the Museum lobby. For more information, call (617) 589-0419. These lectures will be broadcast live over the web and archived on the Museum of Science and Wright Center [illegible] sites: www.mos.org and www.tufts.edu/as/wright_center

[illegible]roline Angel, Special Projects Coordinator, Boston Museum of Science-

Editor's Note: A free CD entitled "Cosmic Evolution – From Big Bang to Humankind" will be distributed after the lectures. It was created by The Wright Center for Science Education, Tufts University, Harvard University, and the Foundation For the Future.

October 3
The Early Universe and the Origin of Galaxies
Krysztof Sliwa (Particle Physicist, Tufts University / CERN) and Mario Livio (Astrophysicist, Space Telescope Science Institute)

October 10
The Birth and Death of Stars and Planets
Stephen McMillan (Stellar Astronomer, Drexel University) and Debra Colodner (Geochemist, Biosphere2 / Columbia University)

October 17
The Origin and Evolution of Life on Earth
David Deamer (Biochemist, University of California—Santa Cruz) and Christopher Willis (Evolutionary Biologist, University of California—San Diego)

October 24
The Onset of Civilization and Prospects for the Future
[illegible]n Fagan (Anthropologist, University of California—Santa [illegible]bara) and Mary Evelyn Tucker (Theologian and Ecologist, Bucknell University)

CCD Workshops at the Clubhouse...

CCD CAMERA making workshops have begun on Thursday evenings (around 7pm) at the clubhouse. Hopefully it will be a weekly activity at the clubhouse in parallel with the ATM workshop. Here are some bullets explaining what the workshop is about:

-This workshop is for anyone interested in making or using his or her own astronomical CCD camera.

-This is not a class, but rather a hands-on forum where participants support each other and learn from each other while building their own CCD cameras or discussing image processing techniques. Although I have some experience with electronics and have participated in building a CCD camera, I am not an expert in making or using CCD cameras -- I will also be learning as I work on my own camera.

-There is no defined beginning/end to the workshop -- feel free to join in later in the year.

-Participants should be prepared to spend several hundred dollars at a minimum for components and literature necessary to build a homemade CCD (e.g. Richard Berry's Cookbook CCD). It will take most people many months to put one together.

-Thanks to the efforts of many ATMoBers there is now a decent electronics room in the clubhouse containing soldering irons, oscilloscope, dvm, and lots of various salvageable electronic components (some from before WWII).

-TED POULOS was kind enough to donate his mostly-finished Cookbook CCD camera (based on the TC245 CCD chip) to the club. So before long we will have a working homemade CCD camera with which to do various imaging experiments (I would welcome helping hands in finishing it). Eventually, we will install it in the observatory. Feel free to drop me an email if you are interested in the workshop, or just show up one of the Thursdays.

-Dan Feldkhun-

Orionids - Debris from Halley's Comet...

The following was reprinted from the October issue of the monthly "NAMN Notes" meteor information journal. Produced by the North American Meteor Network, these "Notes" provide amateurs across the continent with pertinent and timely information about upcoming meteor showers, events, and programs. NAMN is an internet-based organization founded in 1995. Their aim is to encourage amateur visual meteor observing in Canada and the USA. To find out more about NAMN, see their site on the Web at: http://www.namnmeteors.org

THE ORIONIDS (ORI) reach a maximum on October 21st this year, at 08h UT. UT refers to Universal Time, and is the time at Greenwich, England, so you should check your own time zone accordingly. The ZHR, Zenithal Hourly Rate, is about 20 meteors per person per hour, visible with the unaided eye, if an observer is out under a dark country sky, and if the radiant, the area in the sky where the meteors seem to come from, is directly overhead.

The radiant at maximum on the 2st will be at 95 degrees, i.e. RA 6h 19.8m, Dec +16, which is almost in the foot of Gemini, about 4 degrees to the right of the star gamma Gemini, the star Alhena. The radiant (for comparison) on October 10th will be at 88 degrees, i.e. RA 5h 52.2m, Dec +15, which is very near the star 135 Taurus, about 7 degrees north of Betelgeuse in Orion. These are fast meteors, with a velocity of about 66 km per second, and can be seen from about Oct. 2nd through until about Nov. 7th.

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According to the IMO, the International Meteor Organization, in their 2001 Meteor Shower Calendar: "October's waxing crescent moon enhances the Orionids this year too. They are noted for having several maxima other than the main weekend one detailed above, with activity sometimes remaining almost constant for several consecutive nights centered on this peak... All observers should be aware of these possibilities." A map showing the movement of the Orionid radiant throughout October can be found at http://www.imo.net/calendar/cal01.html#Orionids
The Orionid radiant is the line labeled ORI.

The parent body of this meteor shower is the famous Halley's Comet! Edmond Halley was appointed to the Chair of Geometry at Oxford University in 1704, and went on to do an orbital study of several dozen comets observed between 1337 and 1698. It was during this study that he noticed similarity between some of the comets. Once some of these were confirmed to be different apparitions of the same comet, his name became attached - and Comet Halley went on to become famous. According to Gary Kronk's wonderful book "Comets - A Descriptive Catalog", 20th century astronomers have traced Halley's Comet back to 240 BC. In the year 374, it was about magnitude -3.0, with a tail length of about 100 degrees across the sky. In the year 837 it reached about magnitude -2.0 with a 100-degree tail. In 1066 it was noted as brighter, about magnitude -4.0, but no description of tail length was found. In the Middle Ages, tail lengths seemed to be noted as shorter. In 1910, Halley's Comet reached a magnitude of about 0.0, with a noted tail length of 90 degrees. Too bad that we have so much light pollution these days... it is getting harder for the general public to see such wondrous sights! The debris from this wonderful comet is still worth watching for - try to get out of the city and away from all the lights to enjoy the shooting stars from this famous comet!

Other October Showers...

The delta Aurigids (DAU), although having reached a maximum back on September 8th, with ZHR rates of about 6 meteors per hour, are visible in lesser numbers until about October 10th. These are fast meteors, with a velocity of about 64 km per second. At last quarter moon on the 10th, the radiant will be at 95 degrees, i.e. RA 6h 19.8m, Dec +49, which is very near the star psi#1 Auriga. There is a questionable link between these meteors and Comet Bradfield, C/1972 E1. For a map showing the radiant, check out last year's IMO calendar at
http://ww.imo.net/calendar/cal00.html#delta-Aurigids

The Draconids (GIA), also known as the Giacobinids, reach a maximum on October 8th - and are well worth monitoring! The radiant at maximum is at 262 degrees, i.e. RA 17h 28.2m, Dec +54, which is just north of the star beta Draconis, also known as Restaban, in the head of Draco. These are slow meteors, at about 20 km per second, and can be seen from about October 6th to 10th. This shower is named both after the constellation where the radiant is, and after its parent body, Comet Giacobini-Zinner. Giacobini-Zinner is a short period comet, returning about every 6.61 years. The meteor rates are variable - and have stormed in the past, such as in 1933 and 1946 when thousands were seen! This is one of those wonderful showers well worth watching for any surprises! For a map showing the radiant, again, check out last year's IMO calendar at
http://www.imo.net/calendar/cal00.html#Draconids

The epsilon Geminids (EGE) reach a maximum on October 18th, although can be seen from about the 14th to the 27th. On the 18th, the radiant will be at 102 degrees, i.e. RA 6h 48m, Dec +27, which is several degrees north of the star epsilon Gemini, also known as Mebsuta. A map showing the movement of the radiant can be found at http://www.imo.net/calendar/cal01.html#Orionids

ZHR rates at maximum are low, about 2 meteors per hour. These are fast meteors, moving at about 70 km per second. The parent comet is theorized to be either possibly Comet Ikeya, C/1964 N1, or Comet Nishikawa-Takamizawa-Tago, C/1987 B1.

Both the southern Taurids (STA) and the northern Taurids (NTA) start to become active around October 1st, but do not reach maximum until early November. Both have fairly slow meteors, the STA's being about 27 km per second and the NTA's about 29 km per second. At maximum, both showers will have ZHR rates of around 5 meteors per hour, but rates in October will be lower. On October 10th, near the time of the Draconids, the NTA radiant will be at 29 degrees, i.e. RA 1h 55.8m, Dec +14, which is about 7 degrees south of the star beta Aries, known as Sharatan. The STA radiant on the 10th will be at 31 degrees, i.e. RA 2h 4.2m, Dec +8, which is about 5 degrees north of the star alpha Pisces. There is a group of objects possibly associated with the Taurid meteor stream, as parent or sibling bodies, including Comet Encke, and the splitting of these bodies is theorized to have perhaps happened as long ago as 100,000 years in the past, depending on which theories are considered. A map of the northern and southern Taurid radiants can be found in the IMO calendar for 1999, at
http://www.imo.net/calendar/cal99.html#Taurids

There are always very minor showers active as well, but they are not always included on the IMO "Working List of Visual Meteor Showers". For extra reading, you can check out Gary Kronk's "Comets and Meteor Showers" website at
http://comets.amsmeteors.org

Besides recognized showers, there is also sporadic meteor activity in October, about 7 meteors per hour, visible to the unaided eye. This activity is comprised partly of random meteor activity and partly from meteors that belong to long-ago, now untraceable showers.

North American Meteor Network
- Mark Davis, Coordinator- sc.meteors@home.com
http://www.namnmeteors.org
- Lew Gramer, Public Outreach- dedalus@alum.mit.edu
http://www.meteorobs.org

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November *Star Fields* deadline is SUNDAY, October 28th
Email articles to Star Fields Editor / ATMoB Secretary
Eileen Myers at starleen@charter.net
Articles from members are always welcome.

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POSTMASTER NOTE: First Class Postage Mailed October 5, 2001

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MEETINGS: Held the second Thursday of each month (Septemb July) at 8:00PM in the Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge MA. For INCLEMENT WEATHER CANCELLATION listen to WBZ (1030 AM)

CLUBHOUSE: Latitude 42° 36.5' N Longitude 71° 29.8' W

The Tom Britton Clubhouse is open every Saturday from 7 p.m. to late evening. It is the white farmhouse on the grounds of MIT's Haystack Observatory in Westford, MA. Take Rt. 3 North from Rt. 128 or Rt. 495 to Exit 33 and proceed West on Rt. 40 for five miles. Turn right at the MIT Lincoln Lab, Haystack Observatory at the Groton town line. Proceed to the farmhouse on left side of the road. Clubhouse attendance varies with the weather. It is wise to call in advance: (978) 692-8708.

Heads Up For October...

Eastern Daylight (Savings) Time - Subtract 4 from UT to get EDT

Mars moves from Sagittarius to Capricornus late in the month

Mercury (half-lit) and Venus (gibbous) – For 11 days, beginning Oct 27 Mercury and Venus stay within 1° of each other

Saturn in Taurus

Jupiter in Gemini – there will be many double shadow transits on Jupiter in October

Uranus at mag 6 is an easy target for binoculars at 2° NW (upper right) of Gamma Capricornus.

Neptune is also in Capricornus 0.8° to 0.9° E (left) of Omicron Cap

Mon Oct 15 – Zodiacal Light in E before start of morning twilig next two weeks

Sun Oct 21 – Orionid meteors peak. 66 km/s (fast). Zenithal hourly rate is about 20 meteors per hour. Parent body is Halley's Comet.

Sun Oct 28 – Daylight Savings Time ends