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SEPTEMBER 1971

NEWSLETTER OF THE AMATEUR ASTRONOMER'S ASSOCIATION OF PRINCETON

This month's meeting of the Amateur Astronomer's Association of Princeton takes place on September 7 th. at 8 PM, in room A-07 of Princeton University's Jadwin Hall. The door may be locked when you get there, but should be open by 7:50. Speaker will be announced at the meeting.

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SKY CALENDAR FOR SEPTEMBER:

Sept.
3 Mars 6° S. of moon
4 Full moon
6 Moon at perigee
8 Mars at perihelion Delta PISCID meteors
10 Mercury 0.5° S. of REGULUS
Saturn 7 degrees S. of moon
11 Moon at last Quarter
17 Jupiter 1° S. of NEPTUNE
19 New moon
23 Equinox. Autumn begins
25 Antares 0.04° N. of moon
27 Moon at first Quarter
30 Mars 5° S. of moon a-b PERSEID meteors

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DRACONID METEOR STORM NEXT YEAR?

On October 9, 1933, the sky over Europe was filled with meteors. The rate increased until at least 350 meteors filled the sky in 1 minute. Thirteen years later the sky was again filled with DRACONID meteors. The date was October 10, 1946. This time 300/500 meteors were seen in 1 minute. In 1926 British meteor astronomer W. F. Denning proved that the DRACONIDS were debris from the comet GIACOBINI-ZINNER. Whenever Earth intersects the comet's path soon after the comet has passed, we can get a good shower. In 1933 Earth passed through the path 80 days after, and only 8 days after in 1946. The Earth, according to Dr. D.K. Yeomans, University of Maryland, will pass through the comet's orbit 58.5 days after the comet, on October 8, 1972. But how close will the passage be? (Since the path is constantly being altered by Jupiter's orbital path and gravitation.) In 1972 Dr. Yeomans calculations give an approach of only .00074 A.U. to Earth for the debris. The passage for 1946 was much greater being some .00625 A.U. away. Because of its closer approach than in 1946 or 1933 things look excellent for a maximum display in 1972. The places where the shower will best be seen is Japan and Russia.

Taken from METEOR NEWS, Vol. 7 August, 1971

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FOR SALE: 4 1/2 in. EDMUND REFLECTOR WITH ACCESSORIES. GOOD CONDITION. \$90.00
Roxanne Tobin 448-6163

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The AAAP Newsletter's newest feature is a series of abstracts of recent articles of interest to members, which appear in publications other than Sky and Telescope. Most of the publications cited are available at Duncan Planetarium, or from various members. John Church, an active AAAP member, has agreed to write the abstracts. Any other readers willing to help (there are far too many each month for a single person to finish) should contact Norm Sperling at the planetarium.

"Planet Vulcan Found" -- Willingboro Astronomical Society Star Gazer's Journal, July 1971, p. 9.

Dr. Henry C. Courten, an astronomer at Dowling College (Long Island) claims to have photographic evidence for the existence of a minor planet less than 500 mi. in diameter, orbiting the sun at a distance of 9,000,000 miles. The legendary Vulcan? The evidence is on plates taken at the solar eclipses of 1966 and 1970. However, there is a possibility that the "planet" is nothing more than defects on the photographic plate. Photographs at future eclipses may settle the issue. Mr. Spock may have a home at last.

"Transient Phenomena on the Moon", Quarterly Journal of the Royal Astronomical Society, 12:45-7(1971).

Transient lunar phenomena (TLPs) are short-lived localized color phenomena which occasionally appear on the moon. They have been reported as long ago as 1889 by Barnard and have been sighted numerous times since. The most reasonable hypothesis for their origin is the emission of volcanic gasses from the interior of the Moon. Their appearance seems to correlate with the time of lunar perigee, when crustal strains due to tidal forces from the earth are greatest. This seems reasonable from data collected by Apollo 12, which shows that moonquakes are most frequent at perigee. Extreme caution should be used in observing and reporting these events, as they are difficult to see and unconscious prejudice must be avoided.

"The Real-Moon Illusion" George Lovi in Great Lakes Planetarium Association Newsletter, vol VI #1, Vernal Equinox 1971, p. 2.

The author submits that the "real" (as opposed to the well-known "classic" or "zenith-horizon") moon illusion is the fact that anywhere in the sky the moon looks much larger than 1/2 degree in diameter. For this reason, angular distances should never be estimated by referring them to the moon's apparent diameter.

"Characteristics of Artificial Earth Satellites Under Surveillance as of JNL=40951" Independent Tracking Coordination Program Bulletin, Washington, DC.

This is a very complete list of the orbital elements and brightnesses of all known artificial earth satellites, including spent rocket stages, casings, etc. From the extent of the list, it is apparent that space pollution is running close second to air pollution. Anyone like to play "dodge-Em" at 5 mi/sec? The sponsoring organization can supply detailed local predictions for satellite passes for those interested. (Duncan Planetarium will soon receive these predictions, but locations elsewhere in the AAAP area should receive their own to avoid substantial errors in position data.)

"Predictions of Local Circumstances Across Canada of the Total Solar Eclipse of July 10, 1972" -- Royal Astronomical Society of Canada Journal 65, #3:107-18.

This is a very complete article giving detailed weather prospects, contact times position angles of contacts, etc., for the upcoming Canadian eclipse. The meteorological data are very complete, but interpretation of them is largely left to the judgment of the individual -- i. e., no special sites are singled out as being favored over others. In this way, the authors avoid responsibility if you go to Moose Bellow, NWT,

and are wiped out by Hurricane Jezebel (which, judging from the data, is not that unlikely).

"The Magnetism of the Moon", Scientific American, August 1971, p63-73.

Measurements by magnetometers placed on the moon by the Apollo 12 and 14 astronauts have revealed two types of lunar magnetic field: a permanent field due to 'fossil magnetic material' and a transient field associated with the solar wind. These fields are very weak as compared with the earth's field. Analysis of the transient fields shows that the moon's temperature halfway to its center is probably only 1000°C. This would indicate that meteoric impact, rather than volcanic activity, is responsible for most of the moon's surface features.

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MINUTES OF THE BUSINESS MEETING OF THE A A A P, JULY 1971: Kurt R. Rahlfs

Barry Hancock opened the meeting of 21 persons. The first business was to elect the officers for 1971-2. Alex Graam moved that the slate nominated by the nominations committee be accepted. Kurt Rahlfs seconded the motion. The voting then took place with a unanimous vote to elect the entire slate. The new officers are: Director: Barry J. Hancock; Assistant Director: Norman Sperling; Secretary: Kurt R. Rahlfs; Treasurer: Arthur Martz; Program Chairman: J. Leith Holloway.

George Parker gave the treasurer's report, with the club having a balance of \$255.46.

It was then announced that the star party would be held at Cdr. Richey's this year and would be held on the 14th, or on the 15th in case of rain. The picnic committee volunteers: Cdr. Richey, George R. Parker, Kurt R. Rahlfs.

Mike Clark gave the report for the observatory committee. He announced the last time the optics were cleaned was 2 years ago. He then announced Questar was donating its services to clean and coat the optics of the scope. He proposed a contest for students in area schools to design the observatory.

Norm Sperling announced he had extra copies of the Newsletter and had received some new periodicals.

Bob Richardson told the club a disturbance on Jupiter had appeared and was quite large, just north of the Great Red Spot.

The meeting was adjourned at 21:47. Kurt R. Rahlfs, Secretary.

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WANTED: DOUBLE CONVEX LENS, FOCAL LENGTH 700mm, diameter 6mm.
Also wanted: film pressure plate. Contact Derek Lilly, Mountain View Road, Skillman, N J. 609-466-2458

S L R FOR SALE: Praktina FX with: f/2 58mm Biotar lens; case; camera case; neck strap; Vivitar U V filter. Also for sale: 100' bulk film loader. Contact Kurt R. Rahlfs, Honey Brook Dr., R D 2, Princeton, NJ. 609-737-1409.

SEPTEMBER METEORS

shower	mean evening date	radiant (1950.0)	duration (days)	remarks
Delta Piscid	Sep 8	00h32m, -12°	7	
a-b Perseid	30	03h12m, 43°	30	swift, streaked
Xi Piscid	30	01h32m, -02°	7	
Rho Cygnid	30	21h40m, 45°	6	

Full moon on 4 Sept; new moon on 19 Sep.

None of the radiants active in September should produce much activity. September is 4th from the bottom in the amount of meteor observing that is made, so make some hourly counts to help the American Meteor Society's current hourly rate catalog that is being compiled. Send correspondence to the editor, Karl Simmons, METEOR NEWS, 4238 Springwood Road, Jacksonville, Florida 32207.

A membership list of the American Meteor Society is available at Duncan Planetarium

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Duncan Planetarium has been notified by the Smithsonian Center for Short-Lived Phenomena of the following report by Dr. H.B. Wiik, Geological Survey of Finland, Otaniemi, Finland.

"On 2 August 1971 at 3:45 PM, a meteorite fell through a roof on the island of Haverö, 60°14'N, 22°04'E, 25kmSW of the town of Turku (Åbo) in southwest Finland. The building is a storehouse about 100m from the farmer Tor-Erik Andersson's main building. The meteorite made a 15cm hole in the sturdy roof consisting of concrete tiles and 1 1/2 inch boards. It went on through the wooden cover of a box on the floor. This cover is 1 1/2 inch thick. The meteorite was found in one nice piece on the floor of this box. This happened about 5 minutes after the fall. A 9-year-old boy playing in the yard showed the farmer's family where the stone had fallen. The stone was said to be 'warm but not hot' at the moment of recovery. The barn was 'filled with smoke but was not on fire' (Evidently it was only a lot of dust).

Numerous people report sound phenomena 'first like a thunderstorm, then like a jet plane, and then a big bang.' The sound was said to have been heard 'one minute in advance of the big bang.' Interestingly, nobody reports light phenomena. It was bright sunshine at the time and the stone came through the atmosphere almost vertically. This was judged from the fact that the line between the hole in the roof and the hole in the box is only 10° from the vertical line.

The following morning the meteorite was given to Prof. Papunen at the Turku University. He made observations at the place and took the rock to the Geological Department of the University where preliminary investigations were made.

The following day the stone was given to me and I took it to the University of Helsinki, Radiochemical Department, where radiochemical measurements were begun Thursday, 4 August, at 9 AM.

The rock is almost round and covered with a very thin fusion crust. The interior is seen at places where the crust was broken in the collision. The interior is dark gray, crystalline, homogeneous and very hard. A pulver-diagramme showed nothing but forsterite. The weight of the whole stone is 1544 g.

A working group is gathering here for closer investigations. Suggestions for this research are invited from meteorite investigators."

NOTES ON THE JULY A.A.A.P. LECTURE -- Kurt R. Rahlfs.
The July meeting began at 20:15 with 21 people present. Leith Holloway introduced the speaker, Mr. Edmund A. Laport, who spoke on "Radio and Astronomy".

Radio is very important to astronomy. This was shown through 7 areas:

- 1) sun to ionosphere (economic importance)
- 2) sun spots and solar disturbances
- 3) auroræ and magnetic storms
- 4) meteor trails
- 5) antennæ
- 6) planetary surveys
- 7) space activity

Sun to Ionosphere: The sun constantly emits radiation when coming into the atmosphere; they break up atoms into ions. Primarily UV light and X-Rays are responsible for this. The E Layer is the most important. It is the closest to earth, being 100 miles above the surface. In a graph of ion density the E Layer is quite prevalent during the day but becomes unnoticable during the night, when the sun's radiation cannot get to the atoms to break them up into ions.

Sunspots and Solar Disturbances: Solar activity can cause differences to the ionosphere over a long time period, with alternating highs and lows in activity every 11.1 years. Mr. Laport then passed out graphs to show ion density as examples of how these differences are found. These differences are measured at a radio sounding station where pulsed signals of radio waves are sent straight in to the atmosphere and listened for at the same station. Some times when the sun appears to be inactive (no sunspots) the disturbances can be great, and vice versa. This is because of solar flares. These are the real causes of the disturbances, not sunspots. It is just flares appearing more often when there are a great number of sunspots that causes the apparent relation.

Auroræ: Magnetic storms. The Auroral Zone is around the north and south poles. Here at the poles the magnetic lines of force allow the plasma from the sun to enter the atmosphere, thus producing excited ions which emit the light we see as auroræ. The auroræ come and go in unison with the sunspots as does the fluctuations in the ionosphere. But a delay was noticed and only when the sun spots are within a certain area of the sun do auroræ occur. The charge the sunspot has makes no difference, but when 2 of opposite charge are within the area, they neutralize each other and cause no terrestrial disturbance.

Meteor Trails: Meteors also produce ions. It is from these ions that light reaches us to show a meteor has entered the earth's atmosphere. The ions were to be used to reflect radio waves, but at a fast speed because of the briefness of meteors. It was found that sometimes the transmission was continuous. So many more non-visible meteors are present that optical astronomers radically upped their estimates.

Antennæ To find objects in the sky is very difficult because of the averaging effect of the telescope. So interferometers are used. The best that can be done is about $1/10^0$ beam width. An interferometer consists of two telescopes separated by a certain distance to increase the resolution in a certain dimension.

Planetary Surveys: For such a survey it takes a tremendous amount of gain and it is brought up to 10,000:1 on the computer tape. When the observations are made, a month of computer time may be necessary to tell which is noise and which is the

signal. the time gate used screens the signal over a time to find which ones are repeated throughout and thus the reflected signal.

Space Activity: activity is found even in the areas where optical astronomers would have said there would have been negligible results -- so space has much more than the "nothing" it seems to optically.

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Brendan Cuddihee of Nelson Ridge Road, Princeton, is going to do a series of biographical sketches on members of the AAAP, so all members will be known better by other members.

This first biography on Mr. Cuddihee will allow you to know who is writing the biographies -- including your own.

Brendan became interested in having a telescope at the age of 11. Looking through a catalog of a discount store he came across a section describing telescopes and what they can "see". Brendan, not quite sure small telescopes can do so much, but being interested in seeing what the catalog suggested, he asked his parents for a telescope. He persuaded them that it would be worthwhile and educational to have one. So his parents gave him a 60mm refractor for his 12th birthday. The first object he saw through his telescope was Jupiter -- that night he saw the Great Red Spot, the bands and zones, and three of the moons.

Brendan, then being so excited at his first close look at the sky, ran into the house to bring out his parents and the guest of a party his parents were giving to show them what he had seen.

After Brendan received his telescope he learned of the AAAP from a member and joined himself. He says the association has been benefiting him by helping him to understand more about astronomy.

Since joining the association, Brendan has built two equatorial mounts for his alt-azimuth-mounted telescope. The first attempt failed, but through suggestions of club members he succeeded in producing a workable equatorial mount. The inspiration for the improvement came from seeing the association's ATMs and seeing other telescopes.

At the time of the interview, Brendan was planning to observe more as soon as Mars rose a little earlier in the evening. He has attempted to take astrophots but failed and is interested in trying again.

Brendan Cuddihee has done a great deal for his time in astronomy and shows a great deal of enthusiasm. Hopefully he will go on in astronomy beyond photographing the sky.

----Kurt R. Rahlfs.

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E L I A S A B E L S O N

About 12 years ago a new interest was born into the Abelson home: That of astronomy. Elias grasped that sudden interest and held firmly on. The instrument which brought on this sudden interest was the purchase of a 2.4" refractor. With this small instrument Elias started a great exploration through

space with the aid of an eyepiece. Elias also read books on astronomy such as the Field Book of the Skies.

Elias was very much interested when for the first time he observed the craters of the moon. If you think the craters of the moon impressed him, the rings of Saturn (seen through the small telescope) was the best feeling he ever had.

Elias's specialization in astronomy is photography. Elias said he would very much like to join the astrophotography group of the AAAP. Elias also works on some questions of laws in space.

Elias still has his 2.4" refractor but since then has graduated to an 8" reflector.

Elias helped found this club in November 1962. This is the only club he has joined. He has 3 children, of whom the oldest is very much interested in astronomy. A lawyer by profession, he is an assistant Attorney General of the State of New Jersey. He was also the first secretary of the AAAP. He also reviews astronomy books for different publishers, such as Moore.

Elias Abelson lives at 300 Western Way, Princeton; 609-924-9143.

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HAROLD A. BIRNHAGEN

About 10 years ago Harold was a victim of curiosity, so it seems. He was a person who was very often plagued by new ideas. As a result of this curiosity Harold purchased a 4-1/4" reflector. The first gazes at such objects as the craters of the moon and the rings of Saturn brought him so much inward excitement that he reacted much the same way as any other amateur astronomer would react. He would run in and practically drag the rest of his family out to view the same wonderful sights as he had observed.

Since then his interest has tapered off a little and gone to general science. A short time ago he started looking into cosmology. Harold has been reading a great number of books on UFOs. This fascinating subject has since then spurred his interest in astronomy.

About 10 months ago Harold started looking for telescopes. Harold must have been very interested in astronomy because he was willing to invest quite a large sum. He is now comparing apertures to atmospheric conditions in his area.

Astronomy isn't going to be Harold's profession, but a very rewarding hobby. He found out about the club from Mr. Richardson. He is baffled by some astronomical terms and is hesitant to ask questions, but altogether has a good concept of what is going on.

Mr. Harold Birnhagen lives at 17 Wendover Rd., Yardley, Pa. 19067; 215-295-3515.