

Amateur Astronomers Association of Princeton

Duncan Planetarium

Princeton Day School

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The Sidereal Times

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The next meeting of the Amateur Astronomer's Association of Princeton will be held on Tuesday, February 8, 1972, at 8:00 p.m. in Room A-07 of Princeton University's Jadwin Hall (in the Physics Department). Our speaker will be Mr. Richard Gott, III, a graduate student at the Astrophysical Sciences Department of Princeton University. Mr. Gott's topic will be:

"Black Holes".

We plan to entertain our speaker before the meeting at the Holiday Inn dining room on Route 1 in Plainsboro. If you wish to join us, please call Leith Holloway at 924-2480 before the 8th to make reservations. We will meet in the lobby of the Holiday Inn promptly at 6:15 p.m.

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The Study Group meets the Friday after the business meeting, January 11, 1972, at 8:00 p.m. in Duncan Planetarium at Princeton Day School. The topic will be "The Solar System in General", Chapter 12. Mr. Barry Hancock will present the chapter.

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The Astrophotography/Observation Group has its meeting the Friday after the Study Group meets, January 18, 1972, at 8:00 p.m. The Group will meet at Karl Koehler's home in Bordentown.

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Beginning this month the newsletter has been officially named. I have done this so it will become your newsletter too. Please help by contributing anything of interest.

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WRIST WATCH COMPASS

When hiking or in unfamiliar country, you can use your wristwatch to determine the approximate direction of true north.

Point the hour hand of the watch toward the sun. To help in this orientation hold a small straight stick perpendicular to the face of the watch. When the shadow of the stick falls across the hour hand your watch is properly aligned.

A north-south line can be found midway between the hour hand and 12 o'clock (if you are on Standard Time) or midway between the hour hand and 1 o'clock (if you are on Daylight Saving Time).

If there is any doubt as to which end of the line is north, remember that the sun is in the eastern part of the sky before noon and in the western part in the afternoon. The sun, at this latitude, will be nearly due south at noon.

On cloudy days, place a stick at the center of the watch and hold it so that the shadow of the stick falls along the hour hand. Half the distance between the shadow and 12 o'clock (Standard Time) is north.

Test your results with a magnetic compass or reliable map.
---reprinted from the Strassenburgh Planetarium Observer, Rochester, New York.

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"Interstellar molecules" will be the topic of Dr. Arno Penzias at a Princeton University Astrophysical Sciences Colloquium on Tuesday, 8 February. Tea will be served at 4 PM in the Peyton Hall Conference Room. The lecture will start at 4:30 in the Lecture Room. The public is invited.

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The second International Congress of the International Union of Amateur Astronomers (IUAA) will be held in Malmö, Sweden (near Copenhagen, Denmark) 31 July to 5 August 1972. Hosted by the Malmö Astronomi- & Rymdfartssällskap (Astronomy and Astronautics Club) (MARS), the Second Congress will spend much time with the observing sections and their work, as well as the reading of papers and other normal convention work.

At least one day will be spent sightseeing at various places of astronomical interest. In connection with the 400th anniversary of Tycho Brahe's discovery of the 1572 SuperNova, there will be an exhibition featuring Tycho's life and work. There will also be many opportunities for delegates to get to know Malmö in its fullest beauty; it is Sweden's third largest city, and its link to the continent.

A detailed estimate of Congress fees cannot yet be given, as MARS has not yet heard from local authorities concerning financial subsidies. Hotel reservations can be made through the undersigned. To comply with different wishes, there will be a choice of hotel accommodations at varying costs and standards. Further details will be forwarded later.

To make further preparations possible, we anticipate preliminary registrations from those interested before 1 April 1972. Such reservations should be sent to Malmö Astronomi- och Rymdfartssällskap, MARS, Box 250 60, S-200 47 Malmö 25, Sweden.

Further details about the Congress will be announced later.

Thanking you in advance for an early reply, we would appreciate your kind cooperation in making the Congress known to all who might be interested. We are looking forward to meeting you in Malmö!

Yours sincerely, Peter Linde, President, MARS.

January A A A P Minutes

The meeting opened at 8:15 at the Geophysical Fluid Dynamics Laboratory on the Forrestal Campus of Princeton University. The location had been changed because of the basketball game at Jadwin Gymnasium. Program Chairman Leith Holloway introduced the first movie, a prize-winning NASA film on Apollo XI. Between movies, it was announced that the February speaker would be Dr. Gott of the Astrophysical Sciences Department, on "Black Holes". Norm Sperling described preliminary plans for observing the 1972 Total Solar Eclipse in Canada (see attached prospectus). The movie on the Mt. Palomar Observatory was shown.

Cdr. Joseph L. Richey announced that the "Introduction to the Solar System" topic of the study group was being postponed once more, with a planetarium program on the two coming eclipses being substituted.

Karl Koehler announced the current plans of the eclipse expedition of the Amateur Astronomers, Inc., of Cranford, NJ, for the great Sahara eclipse of 1973.

Norm Sperling announced the invitation to the Malmö, Sweden Congress of the International Union of Amateur Astronomers; the postponement of the Apollo XVI Launching and thus the postponement of our trip to it; the special planetarium show for AAAP members; and a variety of current publications available in Duncan Planetarium.

The meeting was adjourned for a tour of the Laboratory and computer at 10:15.

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A few publications relating to the 1973 Sahara eclipse have arrived at Duncan Planetarium. These include: Bulletins #1 & 2 from Roger Tuthill of Cranford, NJ, regarding the charter jet flight his group is planning; The Arnold Tours/Arnold C. Rigby report on conditions in Mauritania; US Naval Observatory Circular #135 by Juliana S. Duncombe; and the Munger Africana Library Note #7 "An Exploration Near Agades and Timbuktu in Advance of the 1973 Total Solar Eclipse" by Jay M. Pasachoff.

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Contributors to this issue: Roxanne Tobin, Norm Sperling, John Church, Leith Holloway, Kurt Rahlfs.

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(this space was reserved for
the article YOU didn't write.

It will be missed...)

"Space Shuttle", NASA, US Government Printing Office, Stock #3300-0386. This is a NASA booklet describing the justification of and the goals for the proposed reusable space shuttle. The key to cost reduction is that the basic shuttle craft will be reusable many times and will be able to land at an ordinary airport, eliminating the need for expensive recovery facilities.

The shuttle itself will be a 2- or 3-stage vehicle. The first stage would be a booster which would lift the orbiter element to about 40 miles altitude and a speed of 8000mph. The booster would then separate and would be piloted back to land at an airport. The orbiter's engines would then propel it into earth orbit where it could be used directly as a platform for scientific work or where it could release an independent orbiting satellite. In any event it would eventually return to land at an airport, too.

Other proposed uses for the orbiter would be for propellant delivery to other vehicles, repair and servicing of existing satellites, and as a launching platform for deep-space probes. The interior of the orbiter would have a pressurized environment much like conventional airliners; maximum acceleration would be no greater than 3 g, so that passengers without astronaut training could be on board. Anticipated payload is 65,000 lb.

"Observational Paradoxes in Extragalactic Astronomy", Science, 17 Dec 71 p1189.

For some extragalactic objects, observational evidence contradicts the usual assumptions about red shifts, ages, and origins. For example, quasars (starlike sources of radio noise) have very high red shifts. If their distances are computed on the basis of these red shifts (as the distances of normal galaxies are computed), then the quasars turn out to have nearly impossibly high luminosities. Also, some quasars vary in optical and radio brightness with periods of a few days. Therefore, their maximum diameter can be no larger than a few light-days. This leads to extremely high energy densities and theoretical difficulties in getting the photons out of the objects without excessive numbers of collisions with electrons. In one special case (quasar 3C 279) two equal sources of radio emission are associated which appear to be separating at ten times the velocity of light, if the red-shift distance of the object is assumed correct.

It has also been found that companion galaxies to large galaxies almost always have higher red shifts than the central galaxy. Statistically, however, we would expect as many lower red shifts as higher red shifts. There are also cases (illustrated with fine photographs) where galaxies are shown connected with filaments to small companion galaxies which have enormously higher red-shift velocities (up to 18,000 km/sec) than the central galaxy. But the velocity of ejection of the companion from the central galaxy is actually probably only a few hundred km/sec, so there is a large discrepancy.

These and other difficulties are serious problems in current theories of the universe and lead to fundamental questions of great significance. One interpretation is that in certain parts of the universe, entirely different laws of physics are at work.

"The Spectrum of Airglow" Scientific American, Jan 72 p 78.

The airglow is a luminescence phenomenon in the upper atmosphere caused by the recombination of atoms and molecules which have been ionized and/or dissociated by the ultraviolet radiation of the sun. It occurs around the clock but is strongest (as the dayglow) in the daytime; of course, it is then the least noticeable because of the great brightness of the sky. It is a nuisance to astronomers at

night because it sets a limit to the faintness of the stars that can be photographed.

The airglow has a very complex spectrum, extending from the ultraviolet through the visible and into the infrared. The H and K lines of calcium, the hydrogen Balmer lines, the various lines of the various forms of oxygen, and even the sodium lines can be readily identified. The details of the processes which give rise to these spectral features are quite complex and still only poorly understood.

"The Gum Nebula", Scientific American, Dec 71, p21.

The Gum Nebula, named for the late Australian astronomer Colin Gum, is a huge diffuse nebula some 40° in radius centered in the southern constellation of Vela. An early theory was that it is a "Strömgren sphere", consisting mainly of interstellar hydrogen ionized by ultraviolet light from nearby hot stars, much as the Orion Nebula is excited by the stars of the Trapezium. A more recent theory is that it is a "fossil" Strömgren sphere consisting of interstellar hydrogen which was excited by a supernova explosion between 11,000 and 30,000 years ago. A pulsar has been detected near the center of the nebula, giving credence to this theory. The center of the nebula is estimated to be 460 parsecs away, and it is considered to be a sphere with radius 360 parsecs.

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Convex reflectors, useful for reducing diffuse images of celestial objects to virtual specular images for magnitude comparisons with stars and planets, have been used for decades. They also have applications in photography and optics. Until this month, optical-quality mirrors were all that were available. Now, a deodorant, Ultra-Ban 5000, has come out with a cap which is quite useful as a convex reflector. You may want to experiment with these reflectors yourself, or donate them to Duncan Planetarium where they will be put to use.

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The new Pathfinder Star Atlas, specially designed for plotting passages of artificial satellites, is now in use at Princeton Day School, together with Standard ZIPSAT predictions. In cooperation with Norton Goodwin, director of the Independent Tracking Coordination Program, PDS astronomy students observe normal satellite passages, and search for those predicted at star parties (see calendar published last month). In addition, it may be possible to see some during the total solar eclipse in Canada next July, despite an unfavorable phase angle. If you are interested in satellite observing, contact Norm Sperling.



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