

NEWSLETTER of the WESTMINSTER ASTRONOMICAL SOCIETY
November 1984, Vol 1 No 6

Learn to Be a Space Navigator The November meeting of the Westminster Astronomical Society will be 7:30 p.m., Wednesday November 28, in room 111 of the Lewis Science Hall, on the campus of Western Maryland College. This month's topic is "Celestial Navigation". The best friend of the astronomer besides his telescope is his trusty sky atlas. Once the basics are learned, finding celestial objects with the atlas is not difficult.

More On The U.S. Space Station This month the WAS special feature on the permanently manned space station continues. The current installment describes the peripheral hardware supported by the orbiting station.

Club Dues Dues schedules were distributed at the October meeting. Since that time several changes have been made, responding to the suggestions of members. First, the club shall not become a member of the federation known nationally as the Astronomical League. The burden of League dues on a small number of members is not justified at this particular time. Second, several members already receive Astronomy magazine and/or Sky and Telescope. Thus subscription is optional. Third, since collecting guest speaker contributions during a meeting is an awkward practice, a "speaker fund" will be supported by the club treasury.

A membership application is enclosed. Please return it by the November meeting.

Constellation Finder Supplement November features a finder's guide for the constellations Pegasus and Andromeda. Both are well placed for Fall viewing. The constellations featured in the Newsletter during its first year or so are large and relatively easy to identify. These will serve as guideposts for other constellations that will be featured from time to time in future issues.

November Star Party Announcement Another star party is planned for Thanksgiving weekend, two days after new moon, on Saturday, November 24, at Curt Roelle's, 3481 Salem Bottom Rd., Westminster. If the weather is questionable, call 848-6384 before coming in case of cancellation. Saturday, December 1st will be the backup date in case of poor weather.

Space Station II: More Than Just A Space Station At the present time the permanently manned space station is simply a concept, albeit a clear one. James Beggs, NASA administrator, Washington, has described the proposed station with these words:

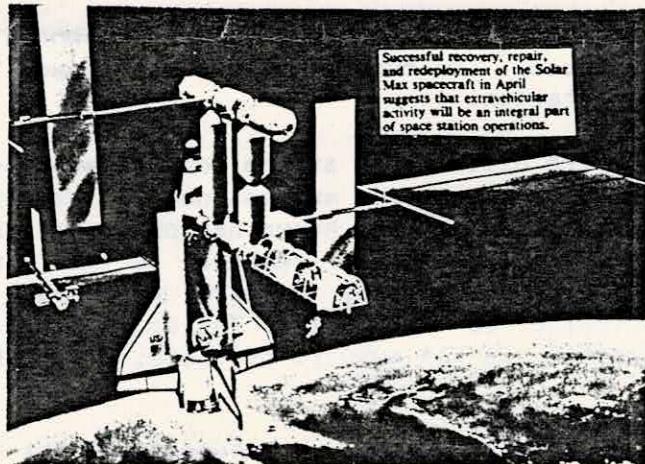
"A space station is a multipurpose, permanent system in low Earth orbit consisting of both manned and unmanned elements--a manned base and associated unmanned platforms--that will significantly enhance the efficiency of space operations...The United States is committed to the development, within a decade, of a permanently manned space station."

One of the unmanned platforms shall be placed in polar orbit. The other platform, like the station itself, will have an orbit inclined 28 degrees to the equator. These platforms will be used to support scientific instruments of undetermined type, to be

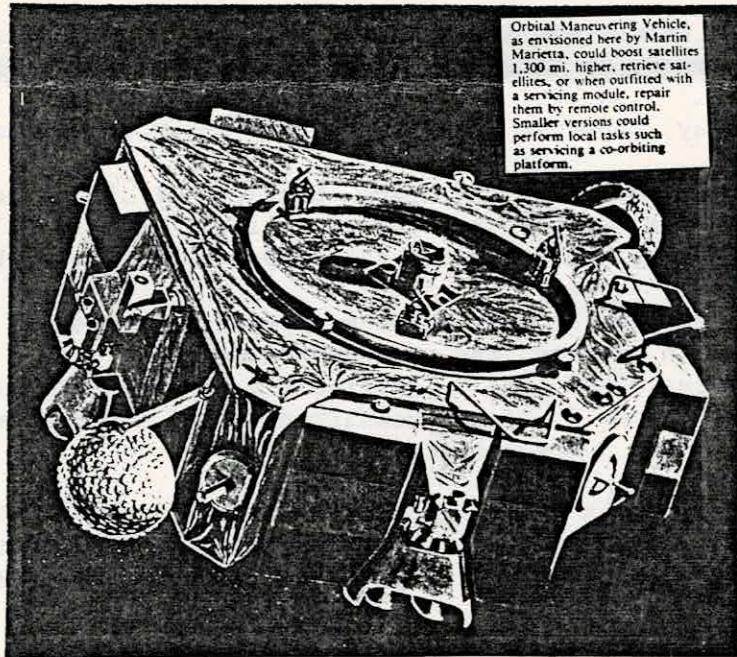
selected by NASA and industry. The platform in polar orbit will be serviced by the space shuttle from the shuttle launch facility at Vandenberg Air Force Base in California. The latter platform would be serviced from the space station itself.

The platforms would be assembled in space from parts carried to earth orbit aboard the shuttle. Beams made from graphite epoxy may be snapped together forming a rigid platform. Servicing of experiments aboard the platform would be performed either by astronauts conducting extravehicular activities (EVA), i.e. spacewalking, or by another new piece of hardware, the Orbiting Maneuvering Vehicle (OMV).

Manned repair of satellites during EVA was demonstrated during the "rescue" of the Solar Maximum Mission (SMM) satellite by the shuttle in the spring of 1984. Aside from hardware problems that plagued the astronauts on two EVA's, the mission was a success. New space suits, manned maneuvering units (MMU), and special space tools will be integrated with the space station.



The OMV will be used as a mini unmanned shuttle. One version proposed by Martin Marietta would boost satellites into orbits up to 1,300 miles higher than the station. It could retrieve spacecraft as well, or with the help of a service module perform remote control repair servicing. Smaller versions could service the co-orbiting platform mentioned above.



PEGASUS AND ANDROMEDA

As in the Spring, Fall is a perfect time to get outside and enjoy the heavens. In the Spring the weather is warming up from the chill of winter, while in the Fall the Earth is gradually cooling from the heat of Summer.

On these nights as most people sit inside oblivious to the celestial wonders surrounding them, a legend from days of old is relived once more. Floating motionless overhead, Pegasus the magnificent flying horse, is winging silently on his nightly journey. At his feet chained to the sea-cliffs of heaven is a helpless maiden, the beautiful princess Andromeda.

Nearly everyone familiar with classical mythology is aquainted with the story of Perseus, who with the help of the goddess Athena, obtained weapons that allowed him to sever the head of Medusa, whose insidious face and serpentine hair was at best hideous. Medusa, a once beautiful priestess, was uglified by Athena after she made love to Poseidon in the goddess' temple. As Perseus smote Medusa, a drop of her blood struck the ground and up rose Pegasus, a horse Medusa had conceived earlier, but was unable to bear because of her cruelty.

Meanwhile in Joppa King Cepheus' wife Queen Cassipeia had been bragging all about that her beauty was greater than that of Poseiden's sea-nymphs. The spiteful nymphs convinced Poseiden to send a monster to plague the land until the king and queen sacrificed Andromeda, their only daughter. Seeing no choice the princess was chained helplessly to the cliffs overlooking the Mediterranean. With the rising tide appeared Cetus, a most challenging monster.

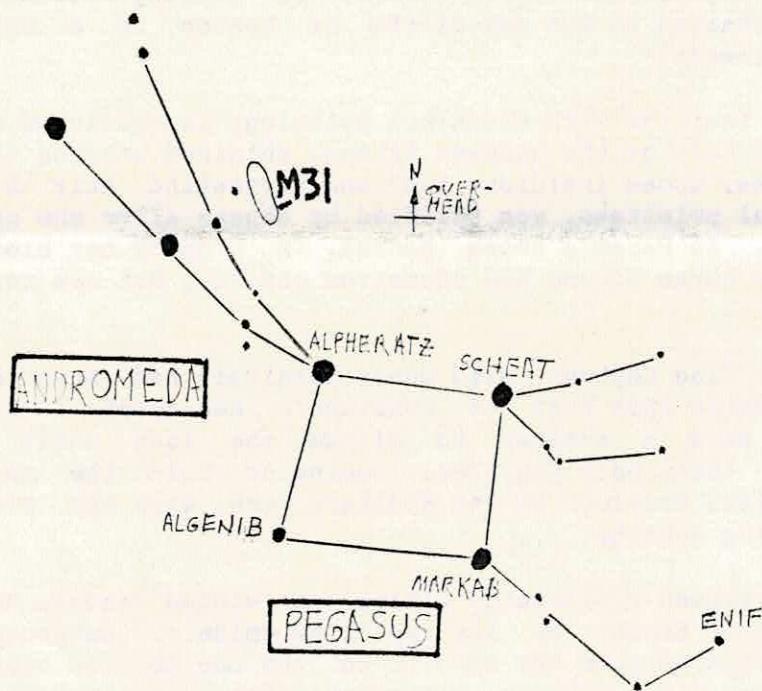
By coincidence, overhead comfortably riding in winged sandals borrowed from Hermes, came Perseus carrying his trophy by its reptilian epidermic outgrowth. He swooped down distracting Cetus who then pursued our hero. As the sea monster closed in, Perseus held out the paralyzing Gorgon head, turning Cetus into stone. Perseus then rescued Andromeda after which they fell in love living happily ever after, and their children were many.

For observers in middle northern latitudes Pegasus passes "upside down" directly overhead on Autumn evenings. The most striking and easily recognizable feature is the "great square", made up of four stars. These are **Markab**, meaning saddle, **Scheat**, or upper arm, **Algenib**, the side or wing, and **Alpheratz**. The star **Enif** marks the head, and the two front legs are clearly visible extending westward from Scheat in the accompanying illustration.

Alpheratz is really in Andromeda. Two lines of stars stretching northeast from Pegasus contain her brightest members. It is fitting that in this constellation of the princess we find the crown of all deep-sky objects, the **Andromeda Galaxy**, or M31. This misty cloud can be seen with the naked eye, and easily in binoculars. It is the closest spiral galaxy to our own, a mere 2.2 million light-years away. In other words, when one gazes at M31, the light that enters the eye left there 2.2 million years ago, thus allowing us to look backward in time. The more distant the galaxy the farther back in time we see.

The nature of galaxies remained a mystery until this century. The debate was settled only 60 years ago whether the exotic spiral-shaped objects were nearby baby stars swirling in the process of stellar birth, or great systems of countless stars--"island universes", reeling majestically in the depths of deep space.

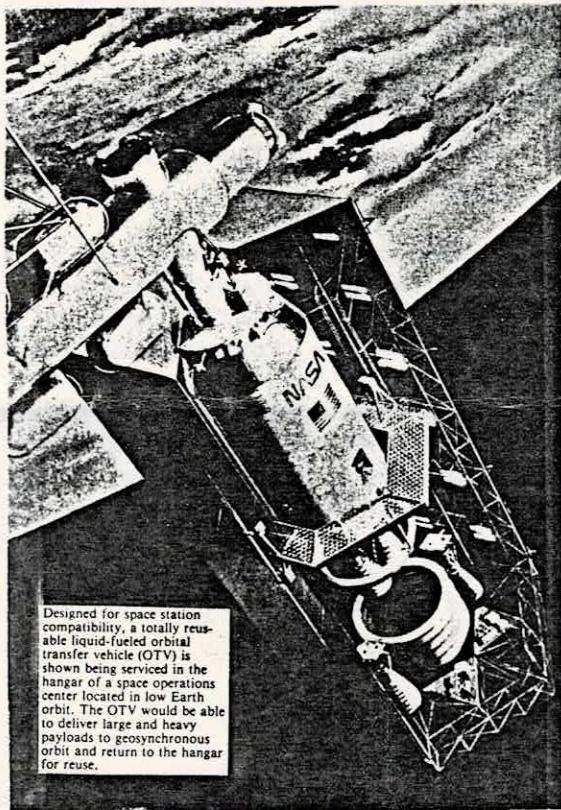
We have since learned that galaxies are distant systems of legion stars. Our galaxy is estimated to contain the mass of 100 to 200 billion suns. M31 is estimated to be similar and probably a little larger. The first sighting of M31 is believed to have been from Persia in 905 A.D. It was not until the 1600's that Andromeda and other galaxies were first observed with a telescope.



Outside using very dim light hold the chart overhead, orienting it with the top facing north, and locate the great square. Once it is found, follow the two star chains of Andromeda part way up to locate M31. Don't give up. The corners of the square are bright stars and the point denoted "overhead" in the map will be straight up for viewers in Westminster each year at the following times:

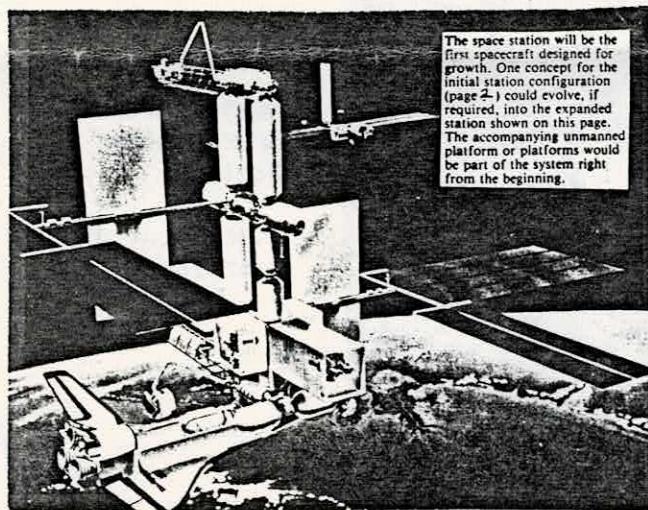
October 1	12 a.m. EDT
November 1	9 p.m. EST
December 1	7 p.m. EST

A larger liquid-fueled OMV could ferry payloads into geosynchronous orbit 22,300 miles above the surface of the earth, and return to a hanger aboard the station for refeuling before reuse.



Designed for space station compatibility, a totally reusable liquid-fueled orbital transfer vehicle (OTV) is shown being serviced in the hangar of a space operations center located in low Earth orbit. The OTV would be able to deliver large and heavy payloads to geosynchronous orbit and return to the hangar for reuse.

This concludes a brief overview of the space station system. In review the hardware consists of a space station, two space platforms, and an orbital maneuvering vehicle (or vehicles). Next month the requirements of the space station itself will be discussed.

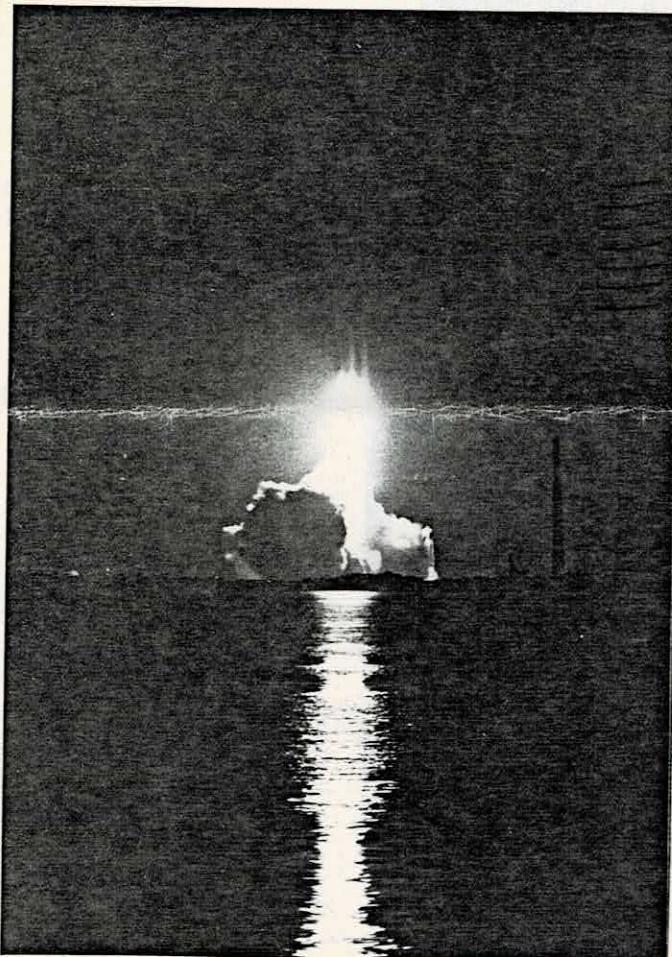


The space station will be the first spacecraft designed for growth. One concept for the initial station configuration (page 2) could evolve, if required, into the expanded station shown on this page. The accompanying unmanned platform or platforms would be part of the system right from the beginning.

Planetarium Shows At Towson Tom Prall, a student at Towson State University, says the college has a series of planetarium shows this season. The next show is entitled "Earth Colonies In Space", to be shown December 6th. The Watson & King Planetarium is on the 6th floor of Smith Hall on the campus. More information may be obtained from the Physics Dept. at 321-3021, or from Tom at 374-6503.

New Paper Published By WAS Guest Speaker Sten Odenwald, guest lecturer at the October meeting contemplates the question "Do we live in the 11th Dimension", in his latest popular work in this month's **Astronomy** magazine. Last month Mr. Odenwald addressed WAS on the subject of infrared astronomy.

Mr. Odenwald began the lecture with a general introduction to infrared astronomy, pointing out the location of the infrared band, between visible light and radio waves, in the electromagnetic spectrum. Much of the visible light in the universe becomes blocked by interstellar dust on its way to earth. Fortunately, infrared "heat" from these distant sources may penetrate the inter-stellar dust, allowing us to "see" what lies beyond. Upon arrival at Earth the radiation is once again blocked, this time by the atmosphere, making viewing from the planet's surface nearly impossible. Mr. Odenwald presented slides he took while participating in experiments using hot air balloons to carry a telescope above the thickest layers of the atmosphere in order to obtain infrared images of the center of our galaxy. On the lighter side, were "blooper" shots of failed launches, with acres of balloon plastic descending to the Texas plains. Details of the high altitude experiments appeared in the August issue of **Astronomy** magazine. Sten is an infrared astronomer in Washington, D.C.



Carrying a world record seven man crew (5 men and two women), the space shuttle "Challenger" ascends during pre-dawn launch on October 5th.

WAS photo by C. Roelle

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Westminster Astronomical Society

Application Form

The Westminster Astronomical Society (WAS) is a non-profit group of individuals interested in amateur astronomy. WAS pursues this hobby through monthly meetings and other club activities including telescopic observing.

WAS invites anyone in the Carroll County area to join. Simply fill out the attached form and either mail it in or bring it to the next monthly meeting.

Members receive the monthly club newsletter. A small portion of your dues is used for club promotional purposes. The remaining balance is the "speaker fund", used to obtain speakers from outside the club for the monthly meetings.

WAS application -- please print

Name: _____ Phone: _____

Street:

City/State: _____ **ZIP:** _____

I want a year's subscription to Astronomy magazine at the reduced club rate of \$12 (circle one): YES NO

I am enclosing \$_____ dues and \$_____ for my subscription to Astronomy.
(Please make separate checks)

Dues checks payable to Westminster Astronomical Society
Astronomy magazine checks Astromedia Corporation

Dues checks payable to Westminster Astronomical Society
Astronomy magazine checks Astromedia Corporation

Return application and remittance to:

Blaine Roelke
Acting Treasurer
Westminster Astronomical Society
6700 Keysville Rd
Keymar, MD 21757