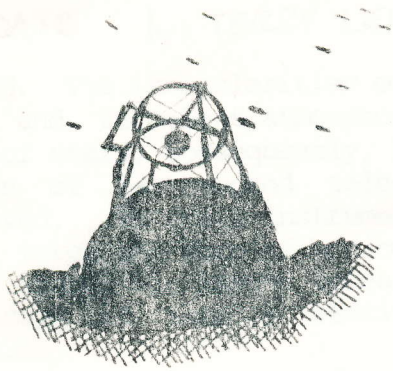


UNIVERSITY LOWBROW ASTRONOMERS

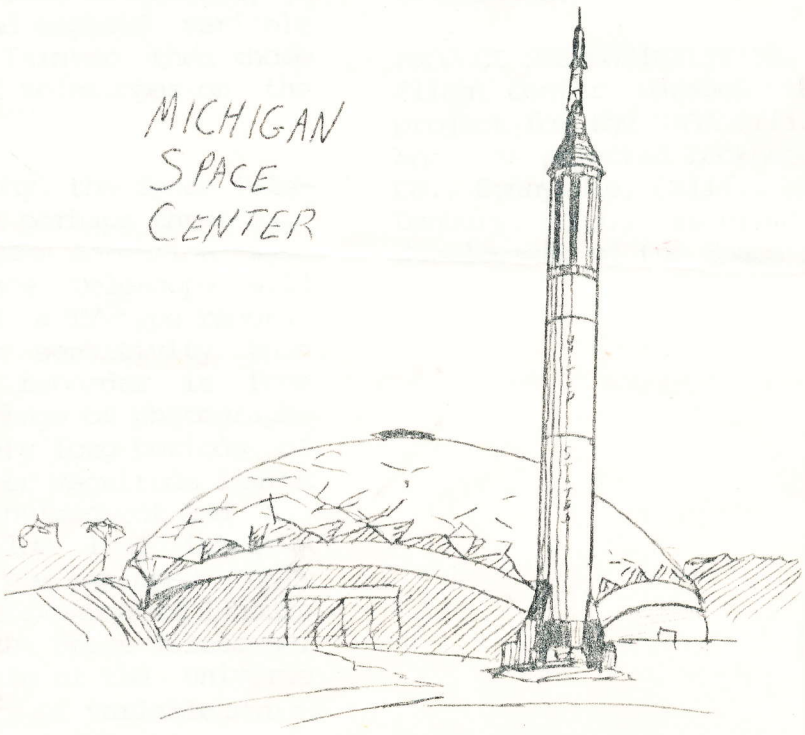
NEWSLETTER

THE LOWBROW CORNER

by: Don Luttermoser

Here we are in the middle of the summer. Can you say that - "summer"? I knew you could! During this last month the 24" reflector's mirror was collimated about 90% to that of perfection, according to club president, Jim Cypser. Doug Nelle is still working on repairing the clock drive.

We have a couple of guest columnist in this issue. I welcome such columnists and all submittions are welcomed and printed. The first column is by Terry Lewis, our regular NASA columnist; and the second column is by Peter Alway. Also the new Lowbrow Logo was designed by Pete Alway.



NASA UPDATE by: TERRY LEWIS

FINER IMAGES. The irregularities of the Earth's hazy and turbulent atmosphere degrade the images of stars; consequently, the actual capabilities of Earth-bound telescopes are never achieved. In small instruments, this distortion takes the form of motion of a small stellar image; in larger telescopes, the effects average out into a stationary but large image.

The guidance system of the Space Telescope can point within an accuracy of 0.01 arc sec and can fix onto targets for extended periods within 0.007 arc sec. (This angle is only slightly larger than that made by a dime when viewed at a distance from Washington, D.C., to Boston.) The resolving power of two point images will be about 0.1 arc sec.

By placing a telescope capable of diffraction limited performance into Earth orbit, once free of seeing problems, long-term exposure images more than 10 times finer than those taken from the ground can be achieved.

FAINTER OBJECTS. The crisper images of the telescope, along with the darker sky background of space, will permit much fainter objects to be detected. By concentrating the star-light into a smaller area, the contrast with the sky background improves. This concentration means that exposure times to reach a given magnitude will be reduced.

With the Space Telescope, astronomers will look at celestial sources such as quasars, galaxies, gaseous nebulae and cepheid variable stars which are 50 times fainter than those seen by the most powerful telescopes on the ground.

For faint object photography, the Space Telescope will be effective at perhaps three magnitudes fainter than the same detection system on the ground. The Space Telescope will be remotely operated using a TV-type recording system of much higher sensitivity than photographic films. This recorder is free from the limited storage range of photographic emulsion and permits very long periods of observation and even fainter magnitude limits. The continuous observing environment and automated techniques will allow long integration times, such as those now employed only by the radio astronomers. Exposures of 10hours may not be uncommon with the Space Telescope. This may establish the scale of the universe through accurate photometry of variable stars, or determine the true stellar composition of globular clusters, to name but two potential areas of study.

ACCESSIBILITY. A further advantage for observational programs lies in the accessibility of all the sky and almost 24 hours of observing conditions. With ground-based observatories, most optical observations are made only during twi-light and dark hours -- and then only when it is reasonably clear. With the Space Telescope, it should be possible to make some observations even in sunlight (although not to the faintest levels) and realize a utilization of about 4,000 hours/year. (Excellent ground-based observatories obtain about 2,000 hours/year.

MAINTENANCE. The Shuttle will launch the Space Telescope into orbit, and will also serve as a base from which astronauts may make repairs and replace instrument packages for new experiments. Each on-obrit replaceable unit can be replaced without affecting the overall system. This servicing capability will help to keep down the total cost, because it is very expensive to achieve the high reliability necessary for a large one-chance satellite.

The Shuttle can also bring the Space Telescope back to Earth, if necessary, for extensive maintenance or overhaul. The Shuttle would be able to re-launch it later, thus approaching the longevity of major ground-based telescopes.

PROJECT RESPONSIBILITIES. NASA's Marshall Space Flight Center manages the Space Telescope project for the NASA office of Space Science. NASA has selected Lockheed Missiles and Space Co., Sunnyvale, Calif., and Perkin-Elmer Corp. Danbury, Conn., as prime contractors for the development of the Space Telescope.

The Michigan Space Center

by: PETER ALWAY

Yes, believe it or not, such a place exists, and within 50 miles of our beloved A^2, so if by some chance there are those among us who have never seen a real live Apollo command module, that situation can be corrected. The "Space Center", a small museum of spaceflight, can be found near Jackson by heading west on I-94 and following any signs indicating the route.

The center can be recognised by a Mercury-Redstone Rocket accompanied by a gold geodesic dome. A word of warning: Anyone who has been to the National Air & Space Museum may want to stop short here. It costs $1.50 for students and $2.50 for adult to get in, and there is nothing inside that can't be found (ten times over!) in the National museum. Such persons who have seen that museum (and are flat broke) may wish to only examine the outdoor exhibits. These include a scale model of the solar system with planet sizes proportional to distances, which gives a truly accurate idea of how much nothing can be found in the solar system. Also there are various rocket engins, including the legendary F-1 of the Saturn Five's first stage.

Inside displays include the Apollo nine Command Module; mockups of Mariner 4 (the first spacecraft to photograph Mars in a fly-by, and also the first spacecraft with solar sails); Surveyor 3 (the craft dissected by the Apollo 12 Astronauts. You know, the ones who destroyed the TV camera and left the color film with the pictures of the Surveyor behind!); Gemini & Mercury craft; an early prototype lunar rover and miscelaneous spacesuits. Short NASA films abound, in a couple of 4-seat mini-theaters and a small auditotrium.

For a more complete description and color photos of the Michigan Space Center, see p.303 of the April 1978 Sky & Telescope.