

# Shuttle Hubble trouble mission worth watching



RAYMOND E. BULLOCK

There will be two events of note in early December: The most complex space shuttle mission to date will be launched, and the Gemini meteor shower will put on its annual display. The odds of the former getting off the ground on schedule are about as good as having clear weather conditions to observe the latter.

The goal of the shuttle mission will be to repair the earth-orbiting Hubble Space Telescope. In perhaps one of NASA's greatest blunders, the telescope was launched with mismatched optics, making a portion of the telescope unusable.

The challenge for the shuttle

crew will be to install corrective optics to solve the problem as well as replace the solar-cell arrays, gyroscopes and various aging electronics, and adding a wide-field and planetary camera. Of the seven crew members, four will be "space-walkers" during five six-hour excursions. Like all shuttle missions, this is not something that skywatchers can view directly, but it is worth mentioning. Let's all wish them success.

Skywatchers will be able to see the moon, of course; go out around 9 p.m. on Dec. 1 and you'll see the moon in the east. The moon will be located within the constellation of Gemini the twins. The star six degrees (12 full-moon diameters) to the right of the moon will be Gamma Geminorum; this is the third brightest star in Gemini, so it was given the third letter of the Greek alphabet.

Gamma marks the foot of Pol-

lux, one of the Gemini twins. The bright star 14 degrees to the left of the moon is Pollux's head. Above Pollux is the other twin, marked by the star Castor. On the evening of Dec. 2, a line drawn from Castor through Pollux will bring you to the moon. (Keep track of the location of Gemini; it is from this constellation that one of the year's best meteor showers will radiate in less than two weeks.)

Castor and Pollux represent another blunder, although this one is NOT of NASA's doing. Many years ago, when the Greek letters were added to the proper names of the stars, Castor was designated Alpha Geminorum and Pollux was given Beta.

This makes perfect sense because they are the first and second brightest stars in Gemini. However, modern measurements of the intensity of these two stars shows that Pollux is actually a bit brighter than Castor. So in the case of Gemini, the star with the second letter of the Greek alphabet is brighter than the star that was designated with the first let-

ter. (It's possible that the luminosity of Pollux increased during the past few centuries.)

Notice the bright star below the moon on the morning of the 3rd. This will be Procyon (PRO see on), also known as the Little Dog star. Procyon is the eighth brightest star in the sky and the fifth closest to us. It always rises slightly before Sirius (SEER a us), the Big Dog star. Sirius, the brightest star in the night sky, will be found below Procyon, near the west-southwest horizon.

Dominating the southeastern morning sky with a brightness even greater than that of Sirius, will be the planet Jupiter. This will be the only planet easily visible before sunrise. Both Mercury and Venus will be in the morning sky, below and to the left of Jupiter, but Mercury will be difficult to see in the glare of morning twilight, and Venus will be just barely above the horizon.

The moon will be found directly below the star Regulus (REG you lus) on the morning of the 5th. Regulus represents the "heart" of

Leo the Lion. On the following morning, at 10:49 a.m., the moon will be at last quarter phase. It will be starting the last quarter of its current orbit around the earth.

Follow the waning (decreasing) crescent moon across the predawn sky beginning with Dec. 9. The bright star directly above the upper crescent ("point") of the crescent on the 9th will be Spica (SPY ka), the brightest star in the constellation of Virgo.

On the morning of the 10th, the moon will be located below Jupiter and to the right of Alpha Librae, also known by the tongue-twisting name of Zosma. El Genubi (ZOO ben el gen YOU bee). The name means "The Southern Claw" and is derived from the ancient time when this star was a part of Scorpius. Libra became a separate constellation long ago, but the name of this star remained the same.

The moon will be 11 degrees above and to the right of Mercury on the morning of the 11th. This will be the last morning you will

be able to see the moon easily. On the following morning the moon will be located directly between Venus and Venus, but it will be extremely difficult to see.

Use binoculars and look toward the east-southeast horizon around 7:20 a.m. An extremely rare event will be visible for skywatchers fortunate enough to be in Hawaii: Venus will be occulted (covered) by the moon this morning.

New moon officially will occur at 4:27 a.m. on Dec. 13. The moon will be located between the earth and the sun and will not be visible. The timing of this new moon phase couldn't be better; it coincides with the peak of the Gemini meteor shower.

Ray Bullock formerly was coordinator of astronomy for Cranbrook. He now is general manager and vice president of a company that works on laser light shows. To leave a message for him from a touchtone phone, dial 953-2047 mailbox number 1852.

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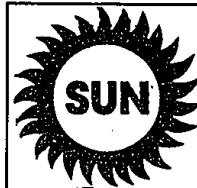
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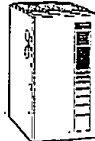
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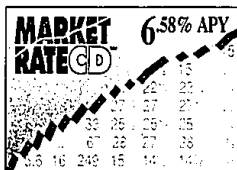
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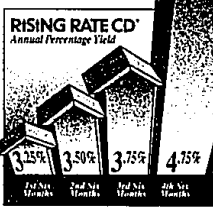
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