NASA

SUNDOWN ON THE MOON—First photograph of the sun's corona taken beyond earth, was made by Surveyor I's television camera June 14, 1966, at 9:03 a.m. PDT. The sun disappeared over the lunar horizon at 9:18 a.m. The moon's horizon is across the bottom of the picture with the solar corona showing above.

SPACE

Overhead Satellite Rare

➤ THE CHANCES of a two-foot satellite passing directly over your head at a precise moment during any given orbit are one in 24 million if you live in the Boston area, and not much better than that no matter where you live.

These odds were calculated by Dr. Henry Friedman, head of data processing at the Smithsonian Astrophysical Observatory, Cambridge, Mass., assuming that the average person's head measures half-a-foot across.

The calculations do not include satellites in stationary orbits, since they revolve around the earth at the same speed the earth rotates underneath them. Once a person was directly under such an equatorial satellite, 23,000 miles above him, both the person and the satellite would stay in the same position for their remaining lifetimes.

Actually, the precise moment when an object passes "overhead" is subject to at least three interpretations, all of them reassuring to anyone fearful of being directly beneath a satellite.

If overhead is interpreted to mean anywhere in the visible sky, then dozens of satellites pass over everybody's head dozens of times, even though there is no precise moment of such a passage. There are now some 1,150 satellites circling earth, and some of the high slow ones can be in view for as long as half an hour.

If overhead means "high in the sky" or something equally vague, then determining when the precise moment of overhead passage begins or ends is impossible.

If overhead means precisely that, the calculations involve not only your head but the satellite's path, time and chance. Dr. Friedman took all these factors into account when he made his calculations on the chances of a two-foot satellite passing directly over any person's head at any given moment.

ASTROPHYSICS

Sun and Moon Change Earth Satellite's Orbit

➤ THE SUN and the moon combine to produce changes in the orbits of earth satellites just as important in affecting their motions as is the earth's shape.

Both theoretical and experimental studies show the effects of solar and lunar forces, Drs. James P. Murphy and Theodore L. Felsentreger of the National Aeronautics and Space Administration's Goddard Space Flight Center, Greenbelt, Md., have found. They have calculated a computer program for analyzing the motions of such far-out satellites as Relay 1 and Telstar 2.

ASTRONOMY

Year's Third Comet Low in Southeastern Sky

➤ THE YEAR'S third comet, and the first with a tail, has been spotted low in the southeastern sky. Although it is not shining brightly enough now to be seen without optical aid, the comet is visible through a telescope six inches or larger.

The comet was discovered by Dr. Roberto Barbon, an astronomer from the Astrophysical Observatory of Padua University, Asiago, Italy, now visiting at Mt. Wilson and Palomar Observatories, Pasadena, Calif.

Details on Comet Barbon, as the object will be named by tradition, were telegraphed or cabled to astronomers around the world by the Smithsonian Astrophysical Observatory, Cambridge, Mass., international clearing house for astronomical information.

The ninth magnitude object is in the constellation of Cetus, the whale, which is low in the southeastern sky during late August mid-evenings. Its precise position on Sept. 7 in flight ascension will be zero hours, 46.1 minutes and in declination will be minus six degrees, four minutes.

When detected on Aug. 15, Comet Barbon was moving plus 0.1 minute a day in right ascension and south 16 minutes a day in declination.

ASTROPHYSICS

Quasars And Quarks Are Objects of Studies

➤ THE MYSTERIOUS nuclear particles called "quarks," which have not yet been detected but might nevertheless be basic building blocks of the atom's core, were probably inhabitants of the primeval universe.

This suggestion was made by Dr. William C. Saslaw, a Fulbright fellow in the department of applied mathematics and theoretical physics at the University of Cambridge, England. His calculations concerning how quarks would affect the birth and evolution of the cosmos were reported in Nature, 211:724, 1966.

Also reported in the same journal is the suggestion that quasars, the most energetic sources of radiation yet detected in the heavens, are much more numerous than had previously been thought.

Dr. P. Veron of the Meudon Observatory in France, plotted the number of radio sources against their radiation output. He could do this because a sufficient number of quasars and radio galaxies have now been identified with optically visible objects.

The calculations showed that many of the radio sources not yet identified with optical objects are most likely to be quasars.