SKY & TELESCOPE
The Essential Magazine of Astronomy

How to Collect Geostationary Satellites

It's very easy to find geostationary satellites, such as those that midnorthern observers often notice crossing the Orion Nebula (October issue, page 142). You just need a 6- to 10-inch telescope and knowledge of where to look.

Geostationary satellites orbit about 23,000 miles above the equator at the same rate the Earth turns, so they stay fixed in the sky with respect to your horizons. Seen from the Northern Hemisphere, they appear a few degrees south of the celestial equator; Southern Hemisphere observers see them a few degrees north. With this in mind, you can use our graph below to find the declination to search.

It helps to have a well-aligned equatorial mount. Aim your telescope at the correct declination (perhaps using a star chart), then lock the declination axis. Turn off the clock drive and slowly sweep east or west within a few hours of the meridian. When you come to each new field, stop and examine the stars as they slowly drift westward. Be patient and work slowly. In not too long you will find a "star" that is not moving at all!

For example, our home is at 34.5° north latitude, so the declination to watch is –5.5°. When we work east and west along this line, we can locate dozens of geostationary satellites.

Most are faint, 11th to 14th magnitude, but at the right Sun angles some briefly become as bright as 7th magnitude. Many disappear into the Earth's shadow for about a month around the March and September equinoxes.

When you find one, use the right-ascension setting circle to measure its hour angle from your meridian. This way you can return to it the next night or even the next week. Identifying *which* satellite you are seeing is a little more difficult, but it can usually be done with material from the Web site http://liftoff.msfc.nasa.gov/realtime/JTrack/3d/JTrack3d.html.

We can assure you, you'll get hooked on these satellites very fast. Good hunting!

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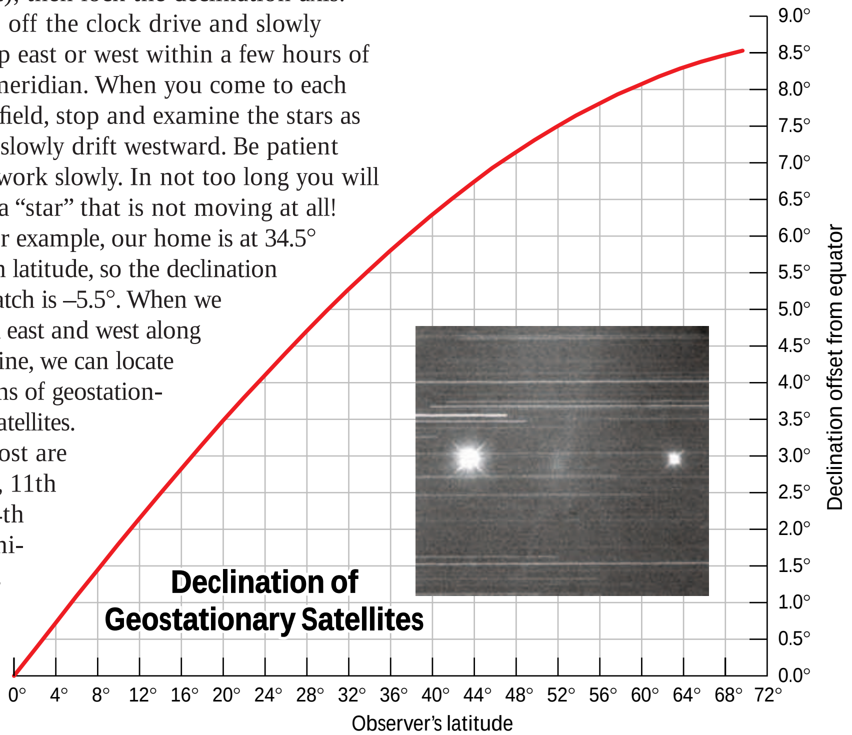

Use this graph to find the declination south or north of the celestial equator where you can spot geostationary satellites from your latitude. *Inset:* Jim Young photographed two of them, DirecTV 2 (left) and DBS-3, using a 24-inch reflector last August 16th. With the telescope's clock drive turned off, stars trailed across the field during this 1-minute exposure while the satellites remained stationary. These two are only 40 miles apart.

Write to: Letters to the Editor, Sky & Telescope, *P.O. Box 9111, Belmont, MA 02478-9111, or letters@skypub.com. Please limit your comments to 300 words. Letters selected for publication may be edited for clarity and brevity. Due to the volume of mail, not all letters can receive personal responses.*

Roping In Party Crashers

Gordon Kirkland's Focal Point about being a nonastronomer lost at a star party highlights a growing trend. At the Texas Star Party, we are seeing more spouses and kids attending with the astronomer in the family.

Some of the most popular awards we give out are the pins for completion of TSP observing programs. Next year we will include an observing list and pin for nonastronomers. This list won't have tough objects like PAL-15 or faint Arp galaxies, but rather constellations, naked-eye clusters, and planets.

If we make the effort to involve these "party crashers," maybe, just maybe, we will add to the ranks of the amateurs.

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More Ways to Sunwatch

Jeff Medkeff's excellent article and listing of solar observatories on the Internet (June issue, page 124) was not meant to be exhaustive, but two very important solar observatory sites deserve special mention for every Sun watcher:

The site for the Mount Wilson 150-foot solar tower (www.astro.ucla.edu/~obs/intro.html) offers, among many other things, daily detailed sunspot magnetic-field drawings made famous by Tom Cragg.

The Big Bear Solar Observatory (www.bbso.njit.edu/) offers the highest-resolution solar images of any observatory on most days, because the telescope is on a tiny island in a mountain lake — a situation designed for excellent daytime atmospheric seeing. Big Bear's large-scale white-light and narrowband pictures are spectacular.

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For the Record

In 1997 Earth passed the orbit of Comet Tempel-Tuttle 108 days before, not after, the comet reached that point (November issue, table on page 31).

50&25 YEARS AGO

JANUARY 1950 "Microwave or radio astronomy is developing rapidly, and much of the observing is being done by electronic technicians who find exploration of the heavens with microwaves as fascinating as their forerunners have found optical searches into the nature of the universe. . . .

"As the front-cover picture shows, a radio telescope bears many resemblances to an ordinary reflector. . . .

"During the two lunar eclipses in 1949, this [30-inch] radio telescope was used . . . to make observations of the temperature of the moon. . . .

"The lunar eclipse observations showed no significant change in the radio temperature of the moon during totality. As the radio energy is believed to originate a few centimeters below the moon's surface, this result is in agreement with what other lines of investigation have already established: that the moon's surface material is fine dust."

Today we know the lunar regolith is indeed very dusty.

JANUARY 1975 "During last August and September, a strange 12th-magnitude object in Cygnus suddenly came under investigation by a score of astronomers using telescopes ranging in aperture from 12 to 200 inches. This object (which is not yet completely understood) contains an unusual far-infrared source, closely associated with nebulosity whose very strong optical polarization was discovered visually with a 12-inch backyard reflector!"

The article gives the early history of the now-famous Egg Nebula — the first-discovered proto-planetary nebula. Looking like a double star in a large telescope, the Egg is at $21^h\ 02.3^m$, $+36°\ 42'$ *(2000.0 coordinates).*

"When Pioneer 11 flew past Jupiter last month and Pioneer 10 went by just a year earlier, an important task for both was to obtain high-resolution photographs of the giant planet's four Galilean satellites. . . .

"Some of the white areas [on Ganymede] might be frozen water, for in 1972 C. B. Pilcher and his collaborators found evidence for frost in the infrared spectrum of Ganymede."

The images, blurry as they were, did indeed show fingerprints of ice.

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