

## ASTRONOMY

# Jupiter and Saturn Prominent

Shooting stars or meteor showers will appear during the first half of August. Under clear conditions as many as 50 may be seen in one hour.

By JAMES STOKLEY

TWO BRIGHT PLANETS, Jupiter and Saturn, can now be added to the five bright stars of August evenings. All these objects are shown on the accompanying maps, which give the appearance of the skies at about 10:00 p.m., your own kind of standard time (add one hour for daylight saving time) at the first of August, an hour earlier at the middle and two hours earlier at the end.

Jupiter is the most brilliant of all of them, with a magnitude of minus 1.7 on the astronomical brightness scale. It stands in the southwest, in the constellation of Libra, the scales, and just to the right of Scorpius, the scorpion. In this group is a star of distinctly reddish hue called Antares. Although a first magnitude star, it is about a sixteenth as bright as Jupiter.

Saturn, farther to the left, in Sagittarius, the archer, is about twice as bright as Antares.

In addition, in the early part of August, another planet which is more than seven times as bright as Jupiter can be seen low in the west just after sunset. This is Venus, which shone so brightly during the spring and early summer, but now is drawing close to the direction of the sun. Thus, it is setting each day a shorter time after sundown, and by the end of August it will go down with the sun. After the first week or so of the month, it will become increasingly hard to see.

Among the stars, in addition to Antares, there are Vega, Arcturus, Deneb and Altair. The first of these, the brightest, is high overhead in Lyra, the lyre. Arcturus is in the west, in the constellation of Boötes, the herdsman. The end of the handle of the Big Dipper, which is now in the northwest, in Ursa Major, the great bear, points toward Arcturus.

Just east of Lyra is Cygnus, the swan, in which a smaller group called the northern cross is seen. Deneb is at the top of the cross, which is toward the north. Altair is high in the southeast, in Aquila, the eagle.

## Perseid Shower

During the first half of August shooting stars, or meteors, of the Perseid shower appear. On any dark night, several times an hour, you may see one of these moving points of light flashing across the sky. Actually it is not a star, but a piece of cosmic debris no larger than a pinhead, that enters the atmosphere of the earth. At a height of perhaps 50 to 60 miles the friction with the air burns it up and it disappears in a flash of light.

Such ordinary meteors come in at random, from any direction. But those which are numerous in early August, reaching their height on Aug. 12, especially in the hours after midnight, seem to radiate from the constellation of Perseus, which is shown on the star maps low in the northeast. Thus, this is called the Perseid meteor shower. Under favorable conditions, as many as 50 may be seen in an hour. This is one of some eleven similar showers which appear at different times of year, and the most reliable of all.

The meteors do not radiate from a point, but they appear to because of perspective. They are moving through space in parallel paths, and these appear to converge in the distance, like the parallel tracks of a railroad.

The orbit in which these meteors move goes around the sun in a long ellipse. Each August the earth crosses their orbit and the shower occurs.

Such an orbit is very different from the nearly circular paths of the planets, but much like those of comets. In fact nearly a century ago an Italian astronomer noticed that the orbit of the Perseid meteors was virtually the same as that of a comet which passed around the sun, at a distance a little less than that of the earth, in 1862.

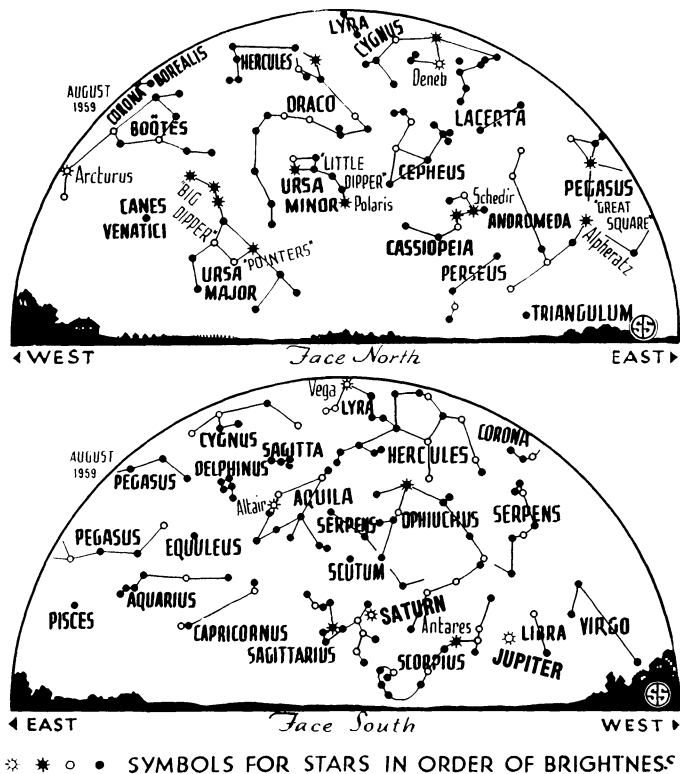
In the following years he, and other astronomers, carried on the work. They found other comets and other meteor showers that had identical orbits. Chance could hardly account for these resemblances; it was evidence that the comets and meteors were related. It seemed that the meteors were the debris left behind after the comet. Several of the comets ceased to appear in such a form, but the meteor shower continued to come back.

## Meteor Composition

Although most meteors are tiny objects that burn completely while many miles above the earth, a larger one arrives occasionally. Large enough to survive its passage through the atmosphere, it lands on the earth as a meteorite. Many of these have been found and are exhibited in museums. Some are composed of iron and nickel, while others are mainly stone.

Probably a large proportion of the meteors flashing across the sky have a similar composition, but recent work with high-altitude rockets indicates that there may be another kind also. Some of these rockets were equipped with microphones, and the sounds they picked up were radioed back to the ground.

In many cases such sounds have given evidence that some unidentified objects were hitting the rockets while high in the atmosphere. Yet when they were recovered after their descent they bore no scars from the collisions. Surely meteors of iron or stone would have left scratches, or dents.



★ \* ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Possibly there is another kind of meteoric body, made of frozen gases, which would be very fragile, and incapable of scarring the rocket casing. Comets, according to a plausible theory, are made of such solid gases, which remain frozen in the intense cold of outer space. And since the meteors from showers such as the Perseids are the remains of comets, they too may be bits of frozen gas.

The stones and irons, on the other hand, may be the fragments left from the break-up of a primitive planet. If so, they would probably be related to the asteroids. These are tiny planets, with diameters from a few hundred miles down to a mile or even less, which move mainly in orbits between Mars and Jupiter. Many thousands of these are within reach of large telescopes, and they are believed to have resulted from the break-up of a larger planet that once moved in this region.

### Celestial Time Table for August

August EST		
4	9:34 a.m.	New moon.
5	12 noon	Mercury passes between sun and earth.
6	5:16 p.m.	Moon passes Mars.
	9:55 p.m.	Moon passes Venus.
10	9:00 p.m.	Venus passes Mars.
11	12:10 p.m.	Moon in first quarter.
	6:39 p.m.	Moon passes Jupiter.
12	early a.m.	Meteors visible from Perseid shower.
13	11:00 a.m.	Moon nearest, distance 229,200 miles.
14	11:43 a.m.	Moon passes Saturn.
18	7:50 a.m.	Full moon.
23	1:00 p.m.	Mercury farthest west of sun, visible for a few days about now as morning star, in eastern sky before sunrise.
26	1:00 a.m.	Moon farthest, distance 251,100 miles.
	3:03 a.m.	Moon in last quarter.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, July 25, 1959

## Do You Know

Fishing through holes blasted in the Antarctic ice and using spotlights to aid in the collection of fish and marine *invertebrates* are among the methods used by scientists working at the U. S. Antarctic Biological Research Laboratory.

Although variable from year to year, the new market for U. S. *cottonseed* meal has been estimated to have reached 300,000 tons annually in recent years.

The Norwegian language is better understood by all *Scandinavians* than either Swedish or Danish.

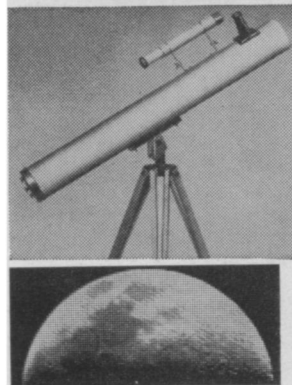
A steel company is building an airtight *metal* fabricating plant in which workers will be required to wear "space" suits.

All the viruses isolated from *colds* so far do not account for more than 30% of all colds.

## GET READY FOR THE SPACE and SCIENCE ERA! SEE SATELLITES, MOON ROCKETS CLOSE-UP

# AMAZING OPTICAL BUYS

### and OTHER SCIENTIFIC BARGAINS



See the Stars, Moon, Planets Close Up!

#### Photographers!

Adapt your camera to this Scope for excellent Telephoto shots and fascinating photos of moon!

#### 3" ASTRONOMICAL REFLECTING TELESCOPE

Famous Mt. Palomar-Type  
60 to 160 Power—An unusual Buy!

You'll see the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, Star Clusters, Moons of Jupiter in detail. Galaxies! This is a fine quality, American-made telescope engineered and built for clear definition and resolution. Equatorial mount with lock on both axes—you automatically follow stars across the heavens. Aluminized and overcoated 3" diameter high-speed f/10 mirror. Each mirror focuait tested. Telescope comes equipped with a 60X eyepiece and a mounted Barlow Lens, giving you 60 to 160 powers. Accessory eyepieces available for higher powers. An Optical Finder Telescope, always so essential, is also included. Sturdy, hardwood portable tripod.  
Free with scope: Valuable STAR CHART and 272 page "Astronomy Book."  
Stock No. 85,050-Q.....\$29.95 Postpaid

This is an actual photograph of the moon taken through our Astronomical Telescope by a 17-year-old student.

#### Terrific Buy! American Made! OPAQUE PROJECTOR

Projects illustrations up to 3" x 3 1/2" and enlarges them to 4 ft. wide. No film or negatives needed. Projects charts, diagrams, pictures, photos, lettering in full color or black-and-white. Operates on 115 volt, A.C. current. Bulb is ordinary 60-watt type. 6-ft. extension cord and plug. Size 12" x 8" x 4 1/2" wide. Weight 1 lb., 2 oz. Plastic case with built-in handle.  
Stock No. 70,199-Q.....\$7.95 postpaid



#### INFRARED NAVY SNOOPERSCOPE

##### War Surplus!

Gov't. Cost \$900—Only \$39.50  
(Converts infrared to visible light. See in total darkness. Use in lab, factory, classroom, etc., or dismantle for fine optical parts or power source. Completely portable. Operates on two flashlight batteries. Size 11 1/2" x 8". Weight with hard rubber carrying case 12 lbs. Image not as sharp as our \$150 Sniper-scope—also no infrared light source is furnished (see below).  
Stock No. 85,098-Q..\$39.50 f.o.b. Barrington, N. J.



INFRARED LIGHT SOURCE AVAILABILITY!  
You will need a 6 volt transformer or 6 V auto battery to operate.  
Stock No. 80,035-Q.....\$10.00 Pstpd.

#### ASTRO COMPASS AND STAR FINDER

Gov't. Cost \$75—Price \$14.95 Pstpd.

Determines position of stars quickly. Shows various celestial coordinates. An extremely useful star finder which can be rotated through 60° angles along calibrated degree scale. Has single eye lens with viewing stop, two spirit levels for aligning, tangent screw with scale for five precision readings, azimuth scale graduated in two-degree intervals, adjustable tilting azimuth scale for angle reference of stars on distant objects. War Surplus. Gov't. cost \$75. Instructions, carrying case included.  
Stock No. 70,200-Q.....Only \$14.95 postpaid



#### D-STIX CONSTRUCTION KITS

Visualize Ideas Fast!

Newest, handiest visualizing and demonstration tool for teachers—elementary, high school or college. Colored wood sticks 1/8" thick and "easy-on" rubber joints approx. 3/16" diam. fit together quickly to form all kinds of simple or complex shapes, structures. Ideal for teaching mathematics, chemistry, physics, design, engineering, architecture, abstract art—or for developing children's interest in form and structure. Work out geometric figures, molecular structures, structural members, configurations and perspectives, models of many types. 3-dimensional visualization adds interest—speeds understanding. Used by professional planners, designers, architects. Money-back guarantee.  
Stock No. 70,209-Q (230 pcs.).....\$3.00 Pstpd.  
Stock No. 70,210-Q (370 pcs.).....\$5.00 Pstpd.



#### INSTRUCTION BOOKLETS

	Stock No.	Price
How to Build Projectors.....	9014-Q	30¢
Homebuilt Telescopes.....	9006-Q	40¢
All About Telephoto Lenses.....	9036-Q	60¢
Ultra Close-Up Photography.....	9042-Q	60¢
Infra-red Light and Its Uses.....	9040-Q	75¢
Homemade Stereo-Adapters.....	9032-Q	30¢
Homemade Stereo-Viewers.....	9034-Q	30¢
Time in Astronomy.....	9054-Q	60¢
Fun with Optics.....	9050-Q	50¢
How to use your Telescope.....	9055-Q	60¢

(Includes directions on how to take photographs thru your telescope)

4 1/4" ASTRONOMICAL TELESCOPE  
Mt. Palomar type! Up to 270 Power. A fine Reflector Telescope complete with real Equatorial Mount and Tripod and 6X Finder. Aluminum tube 4 1/4" dia. mirror, rack and pinion focusing eye-piece holder. 2 eyepieces and mounted Barlow Lens for 40X, 90X, 120X and 270X. Low cost accessory eyepiece available for higher powers. Shipping weight approx. 25 lbs.  
Stock No. 85,006-Q, complete \$74.50 f.o.b. Barrington, N. J.  
Same Telescope as above but equipped with Electric Clock Drive—Stock No. 85,094-Q, \$111.50 F.O.B. Barrington, N. J.

#### NEW! STATIC ELECTRICITY GENERATOR

Sturdy, Improved Model  
See a thrilling spark display as you set off a miniature bolt of lightning. Absolutely safe and harmless—perfect for classroom experimentation—ideal for Science Clubs. Sturdily made—stands 14" high. Turn the handle and two plastic discs rotate in opposite directions. Metal collector brushes pick up the static electricity, store it in the Leyden jar type condenser until discharged by the jumping spark. Countless tricks and experiments. 24-page instruction booklet included.  
Stock No. 70,070-Q.....\$12.95 Postpaid

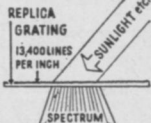


#### REPLICA GRATING

Low, Low Cost

Take Unusual Color Photos at Night:

It's here—after decades of effort. Replica Grating, on film, at very low price. Breaks up white light into full spectrum colors. An exciting display. 13,400 lines per inch. Diffraction Grating has been used to answer more questions about the structure of the material world and the universe than any other single device. Use it for making spectroscopes, for experiments, as a fascinating novelty. First time available such large size—so cheaply. Comes in clear plastic protector.  
Stock No. 50-202-Q. Includes 2 pieces 8" x 5 1/2" —1 transmission type, 1 reflecting type. \$2.00 Pstpd.



#### BUILD A SOLAR ENERGY FURNACE

Wonderful Science Project

Build your own Solar Furnace for experimentation—many practical uses. It's easy—inexpensive. Use your scrap wood. We furnish instruction booklet. This sun powered furnace will generate terrific heat—2000° to 3000°. Fuses enamel to metal. Sets paper aflame in seconds. Lens—1 1/2" diameter, f.l. 14".  
Stock No. 70,130-Q...Fresnel Lens...\$6.00 Postpaid



#### HORSE SHOE MAGNETS

Set of 2—approximately 1 1/2 ozs. ea. (set of 2)  
Stock No. 40,275-Q (set of 2)  
\$1.00 postpaid  
Giant Size War Surplus—Will lift over 125 lbs.  
Stock No. 70,183-Q \$8.50 ea. pstpd. (Send Check or M.O.—Money-Back Guarantee)



#### FREE CATALOG-Q

100 Pages! Over 1000 Bargains!

America's No. 1 source of supply for science experimenters, hobbyists. Complete line of Astronomical Telescope parts and assembled Telescopes. Also huge selection of lenses, prisms, war surplus optical instruments, parts and accessories. Telescopes, microscopes, satellite scopes, binoculars, infrared sniper-scopes, items for making "Science Fair" projects, etc.



Request Catalog-Q  
Order by Stock No.—Send Check Satisfaction Guaranteed

ORDER BY STOCK NUMBER . SEND CHECK OR MONEY ORDER . SATISFACTION GUARANTEED!

EDMUND SCIENTIFIC CO., BARRINGTON, N. J.