Joe Orman's Naked-Eye 100

Title	Description
All-Night Sky	Stay up all night and watch the sky change as the earth turns.
Andromeda Galaxy	This faint patch of light is the farthest thing visible to the naked eye, over 2 million light-years away!
Antares, The Rival Of Mars	This red giant star in Scorpius is sometimes close to Mars, and they look the same- bright and pink.
Anticrepuscular Rays	Crepuscular rays converging on the antisolar point; often very faint and diffuse.
Arc To Arcturus	Follow the curve of the Big Dipper's handle to a bright star- Arcturus in Bootes.
Artificial Satellites	ISS, HST etc. look like stars moving steadily across the sky. Check heavens-above.com for visibility.
Asteroids	Usually too faint to see, but on April13, 2029, asteroid 2004MN will make a close naked-eye pass.
Aureole	Bright glow around the sun or moon, colorless and only a few degrees across.
Aurora Borealis	Northern Lights. From the southern U.S., can occasionally be seen as a reddish glow in the northern sky.
Bailey's Beads	Sunlight peeking between the mountains of the moon during a total solar eclipse.
Belt Of Venus	A band of pink above the horizon; look opposite the sun just before sunrise or just after sunset
Betelgeuse	The Hunter's left shoulder is a red giant star, bright and pink to the eye.
Big Dipper	The body and tail of Ursa Major, the Big Bear. Close to Polaris in the northern sky.
Big Dipper Double-Star	The star where the dipper's handle bends, Mizar, has a fainter companion Alcor- a good test of vision.
Big Dipper Pointer Stars	Follow the last two stars in the bucket to find Polaris, the North Star.
Cassiopeia	In the shape of a "Broken W." Close to Polaris in the northern sky.
Center Of Our Galaxy	Look at the "steam" cloud above the teapot's spout; that's the direction of the center of the Milky Way.
Comets	Every year or so one reaches naked-eye visibility. Even rarer are bright "Great Comets" like Hale-Bopp.
Corona	In thin clouds, colored rings a few degrees across around sun or moon.
Crepuscular Rays	Brilliant streaks of light iadiating from clouds backlrt by the sun.
Crescent Moon	On evenings after new moon, look for the delicate crescent above the twilight horizon after sunset.
Cygnus The Swan	This cross-shaped constellation really looks like a long-necked bird in flight
Diamond Ring	A brief flash of direct sunlight signals the beginning and end of a total solar eclipse.
Double Rainbow	The outer, or secondary, rainbow is 51 degrees in radius. Colors are reversed.
Drive A Spike To Spica	Continue the curve past Arcturus to another bright star - Spica in Virgo
Earthshine	Sunlight reflected off the earth onto the dark side of the moon; best when moon is thin crescent.
Ecliptic	The sun, moon and planets make a straight line across the sky - the

	plane of our Solar System.
Equinox Moonrise	Near the spring and fall equinox the full moon rises straight east, opposite the sunset in the west.
Equinox Moonset	Near the spring and fall equinox the full moon sets straight west, opposite the sunrise in the east.
Equinox Sunrise	About March 20 each year, the sun rises straight east. Look along an east-west aligned street, canal, etc.
Equinox Sunset	About Sep. 22 each year, the sun sets straight west. Look along an east-west aligned street, canal, etc.
Fall Asleep While Watching Sky	Make your bed under the open sky. Lie back, look at the stars, close your eyes and dream of infinity.
Full Moon	Be sure to also look at the surrounding landscape bathed in the cool moonlight
Gegenschein	A faint patch of light on the ecliptic; look at the antisolar point around midnight
Geminid Meteor Shower	December 13-14 each year. After 9 p.m., lie on a blanket or lawn chair and look up.
Glitter Path	The sun or moon's reflection forms a column of glittering light on rippling water.
Glory	Looking into fog or clouds from a plane or mountaintop, colored rings around the antisolar point
Green Flash	Need a low flat horizon and clear skies. The upper limb of the sun flashes green just before setting_
Harvest Moon	The full moon closest to fall equinox; rises soon after sunset for several days in a row.
Hyades	The 'V'' shaped open cluster in the face of Taurus the Bull; Aldebaran is the bright star among them.
Iridium Flares	Flash that lasts several seconds; like a slow-moving meteor. Check heavens-above.com for visibility.
Jupiter	Looks like a bright star; magnification needed to see the 4 Galilean moons.
Leo The Lion	The sickle shape forms the lion's mane, the bright star Regulus is lion's heart.
Leonid Meteor Shower	November 17-18 each year. Between midnight and dawn, lie on a blanket or lawn chair and look up.
Let The Moon Follow You Home	The moon seems to follow you as you drive along the road - a trick of perspective.
Lightning	Lightning is an awesome sight day or night, but use caution and observe from a safe distance!
Little Dipper	In the constellation Ursa Minor, the Little Bear. Extends from Polaris; a lot fainter than the Big Dipper.
Irisation (Iridescent Clouds)	Mu i-colored patch in thin clouds or on cloud edges many degrees from the sun
Lunar Eclipse, Partial	The earth's shadow, takes a bite out of the moon.
Lunar Eclipse, Total	The moon passes totally within the earth's shadow, often turning a dark reddish color.

Lunar Occultation, Planetary	Occasionally the moon also passes in front of one of the planets.
Lunar Occultation, Stellar	Antares, Regulus, Aldebaran and Spica all lie near the ecliptic and are occasionally covered by the moon.
Magellanic Clouds	These neighboring irregular dwarf galaxies can be seen from the southern latitudes.
Mars	Near opposition, Mars is a brilliant object in the night sky.
Mercury	For a few days every month or two, Mercury rises above the glow of twilight and is easy to see.
Milky Way	Our own galaxy seen edge-on; this faint band crossing the sky is the combined light of millions of stars.
Mirages	The sky reflected off temperature boundaries close to the ground.
Moon Halo	Same as a sun halo, but seen around the moon at night.
Moon Reflected In Water	This sight has inspired poets and lovers for ages.
Moon-Planet Conjunction	Venus is the crescent Moon's most noticeable companion, but look for other planets near the moon too.
Moonrise	The rising moon silhouetting a distant mountain, tree, or saguaro cactus is an awe-inspiring sight
Moonset	Whether full moon or crescent, the last bit to slip beneath the horizon always brings a special sadness.
Mountain Shadow	From the top of a mountain, look opposite the sunset; perspective makes a cone-shaped shadow.
Noctilucent Clouds	Rarely-seen clouds of ice particles at the edge of space after twilight; seen only from high latitudes.
Omega Centauri	This globular cluster looks like a fuzzy patch to the naked eye; a telescope shows the individual stars.
Orion Nebula	Look for the diffuse patch in the middle of the sword hanging from the Hunter's belt.
Orion The Hunter	This constellation really looks like a human figure; the three evenly-spaced stars are the Hunter's belt.
Other Halos	Circumzenithal arc, tangent arcs, Parry arc, 46-degree halo- some are subtle and rarely seen.
Perseid Meteor Shower	August 12-13 each year. Between midnight and dawn, lie on a blanket or lawn chair and look up.
Planetary Conjunction	Look for 2 or more planets appearing near each other. Occasionally planets appear very close to background stars.
Pleiades	A tight cluster of 6 or 7 bright blue stars, in the form of a miniature dipper.
Polaris	The North Star, the axis of the sky as the earth turns.
Rainbow	The primary rainbow appears as an arc 42 degrees in radius centered around the antisolar point
Rocket Trails	Rocket launches from Vandenberg or White Sands can be seen from hundreds of miles away.
Sagittarius	The teapot shape is distinctive in the southern sky on summer nights.
Saturn	Looks like a bright star; magnification needed to see the rings.
Scorpius	This constellation really looks like a scorpion; the bright stars Antares is the scorpion's heart.

Sirius	The brightest star in the night sky; twinkles different colors when low in atmosphere. In Canis Major.
Solar Eclipse, Annular	The moon appears in line with the sun but does not completely cover it, leaving a "ring of fire."
Solar Eclipse, Partial	The moon takes a bite out of the sun. Use proper eye protection!
Solar Eclipse, Total	Within the path of totality, the moon completely covers the sun, revealing the beauty of the sun's corona.
Solar Transit Of Mercury	Fairly rare; 13 or 14 each century. Next occurrence is November 8, 2006. Use proper eye protection!
Solar Transit Of Venus	Very rare; only twice a century. Next occurrence is June 5, 2012. Use proper eye protection!
Southern Cross	The constellation Crux lies near the south celestial pole.
Spectre Of The Bracken	Your own shadow in the center of the glory.
Sporadic Meteors	Random "shooting stars" or • ailing stars" can be seen any night of the year. Make a wish.
Summer Triangle	Bright stars Deneb in Cygnus, Vega in Lyra, Altair in Aquila form triangle visible in evening all summer.
Sun Halo	On winter days with thin clouds, look for a complete circle around the sun, 22 degrees in radius.
Sun Pillar	Vertical column of light above sun when sun is on horizon; formed by reflection off ice crystals.
Sundogs (Parhelia)	Appear in thin clouds as bright colored patches 22 degrees to the left and right of the sun.
Sunrise	As we tum from the night side of our planet to the day side, our closest star appears in the sky.
Sunset	Watch our closest star set, but keep watching afterward for the best sky and cloud colors.
Sunspots	Occasionally sunspots get big enough to see without magnification. Use proper eye protection!
Twilight	After sunset or before sunrise, the sky is an pastel palette of orange, pink, purple, blue and black.
Venus	Brightly visible above the morning or evening twilight for several months at a time.
Venus In Daytime	Easy to see if you know where to look and can focus your eyes at infintty. Helps if moon is nearby.
Whole Sky	Find a wide open space and look at the dome of the sky- the sky is an infinite sphere centered on you.
Winter Hexagon	Sirius, Procyon, Pollux & Castor, Capella, Aldebaran, and Rigel fonn a hexagon on winter evenings.
Zodiacal Light	A pale cone of light along the ecliptic; best seen before dawn in the fall or after sunset in the spring.

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ANNUAL METEOR SHOWERS CALENDAR

DATE	DESCRIPTION	DURATION
January 4:	Quadrantids: Radiant-Bootes. Very short lived shower, less that one day. Variable rate, but generally around 60 per hour. Speed 41 kps and bluish color.	
January 16:	Delta Cancrids: Radiant-just west of Beehive. Minor shower, rate about 4 per hour. Very swift.	
January 18:	Coma Berenicids: Radiant-near Coma star duster. Only one or two per hour, but among fastest meteors known-65 kps.	
February 26:	Delta Leonids: Radiant--midway in Leo's back. Feb. 5 to Mar. 19 with peak in late Feb. 5 per hour at 24 kps.	
March 16:	Corona-Australids: Radiant--16 hr 20 min, -48 deg. 5 to 7 per hour from Mar. 14 to Mar. 18.	
March 22:	Carnelopardalids: No definite peak, with only one per hour. Slowest meteors at 7 kps.	
March 22:	March Geminids: Discovered in 1973 and confirmed in 1975. Rate generally about 40 per hour. Seem to be very slow meteors.	
April 4:	Kappa Serpentids: Radiant-near Corona Borealis . 4 or 5 per hour from Apr. 1 to 7.	
April 7:	Delta Draconids: Radiant--near Cepheus border. From Mar. 28 to Apr. 7. Slow meteors at about 5 per hour.	
April 10:	Virginids: Radiant- near Gamma in bowl of Virgo. 20 per hour.	
April 15:	April Fireballs: Radiant- between The Water Jar and Scutum, very enratic. From April 15 to 30 many bright bolides from Southeastern *sky.*	
April 17:	Sigma Leonids: Radiant- at Leo Virgo border, actually has moved into Virgo in recent years. Weak shower of 1 to 2 per hour.	
April 22:	Lyrids: Radiant- near Vega. 15 per hour, bright and long lasting meteors. From Comet Thatcher.	
April 25:	Mu Virginids: Radiant-near Ubra. 7 to 10 per hour of medium speed meteors.	
April 28:	Alpha Bootids: Radiant- near Arcturus. From Apr. 14 to May 13. Slow meteors with fine trails.	
May 1:	Phi Bootids: Radiant-near Hercules. From Apr. 16 to May 12. 6 per hour.	
May 3:	Alpha Scorpiids: Radiant- Near Antares. From Apr. 16 to May 9.	
May 4	Eta Aquarids: Radiant- near Water Jar. From Apr. 21 to May 12. 21 per hour, yellow with bright trails. Cornet Halley debris.	
June 3:	Tau Herculids: Radiant-near Corona Borealis. About a month long, 15 per hour max, most quite faint.	
June 5:	Scorpiids: Radiant--near Ophiuchus. 20 per hour with some fireballs.	
June 7:	Arietids: A bout 30 per hour. Slow moving with some fireballs.	
June 13:	Ophiuchids: Radiant- near Scorpius. Only 3 per hour but fast moving bolides are common.	25 days
June 16:	June Lyrids: Radiant-near Vega. Another part of May Lyrid meteor stream. 15 per hour, faint blue meteors.	
June 20:	Ophiuchids: Radiant- near Sagitarrius. Rate varies from 8 to 20, with occaisionally many more.	

June 30:	June Draconids: Radiant-near handle of Big Dipper. Rate varies from 10 to 100 per hour. Pons-Winnecke Comet is parent.	
July 28:	Delta Aquarids: Radiant--near Capricomus. 25 per hour, slow (24 kps) with yellow trails.	40 days
July 30:	Capricomids: Radiant--near Aquarius. Tough to tell these from Delta Aquarids. 10 to 35 per hour with bolides.	
August 10:	Perseids: Radiant-near Double duster. 50 to 100 per hour, yellow with trails and bolides. The best modem dependable shower.	5 days
August 20:	Kappa Cygnids: Radiant--near Deneb. 12 per hour with *many* fireballs.	15 days.
August 31:	Andromedids: Radiant- near Cassiopeia. Occaisionally spectacular, usually 20 per hour. Some red fireballs with trails. Biela's Comet parent.	
September 23:	Alpha Aurigids: Radiant- near Capella. 12 per hour, fast with trails.	
October 7:	Pisdds: Radiant-near Aries. 15 per hour at 28 kps.	
October 9:	Draconids: Raidiant-near Hercules. Spectacular when comet Giacobinni-Zinner passes near Earth. 200 per hour when cornet is dose is not uncommon, 1000 per hour sometimes.	
October 20:	Orionids: Radiant-near Taurus. 30 per hour, fast (67 kps) often in colors with long trails.	8 days.
November 5:	Taurids: Radiant-near Pleaides. 10 per hour with many fireballs. Debris from comet Encke.	45 days.
November 12:	Pegasids: Radiant-Near Square. from Oct. 10 to late Nov., 10 per hour, used to be spectacular.	
November 17:	Leonids: Radiant-near Sickle. Most spectacular of modem showers. 1966 saw 500,000 per hour-140 per second. Comet Temple--Tuttle is parent. 20 per hour between 33 year shows, fastest known at 71 kps.	4 days
December 10:	Monocerids: Radiant- near Gemini. 1Z per hour.	
December 11:	Sigma Hydrids: Radiant-near Head. 12 per hour, fast.	
December 14:	Geminids: Radiant-near Castor. 60 per hour, many bright, white but few trails. Icarus, - Earth-crossing astroid seems to be the parent.	6 days
December 14:	Leo Minorids: 10 per hour, somewhat faint. Discovered *by* amateurs in 1971.	
December 20	Delta Arietids: 12 per hour, must view in early evening, before radiant sets.	
December 22:	Ursids: Radiant--uttie Dipper Bowl. Medium speed, 20 per hour, *many* with bright trails.	2 days

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