

IAAS Monthly Astronomy Newsletter
September 2010

The International Association for Astronomical Studies provides this newsletter as a service for interested persons worldwide.

This newsletter is published on the World Wide Web at <http://www.ki0ar.com/astro.html> - The Home of KI0AR - and is received nationally and internationally. A PDF formatted downloadable version of the newsletter is at http://www.ki0ar.com/current_nl.pdf.

This newsletter is now available as an iTunes podcast. Visit <http://www.apple.com>, download and install iTunes (for either Mac or Windows). Search for "IAAS" and subscribe to the podcast. You may also go to <http://www.ki0ar.com/astro.html> and click on the Subscribe/RSS link. Update your iPod or mp3 player and listen to the newsletter at your leisure. Since this is a new feature, comments and constructive criticisms are greatly appreciated.

An Open Invitation - For amateur radio operators and scanner enthusiasts, when in the Denver metro area, please join the Colorado Astronomy Net on the Rocky Mountain Radio League's (<http://rmrl.hamradios.com/>) 146.94 MHz repeater on Tuesday nights at 7 P.M. local time.

Special Notice to Denver, CO area residents and visitors to the area: The Plains Conservation Center in Aurora hosts Full Moon Walks every month, weather permitting, on or near the night of the full Moon. Visit <http://www.plainsconservationcenter.org> for more information and directions.

Excerpts from JPL mission updates are provided as a public service as part of the JPL Solar System Ambassador / NASA Outreach program.

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The Month At-A-Glance at <http://www.ki0ar.com/ataglance.html>
A calendar displaying the daily astronomical events.

The Moon

Phases:

- * Last Quarter Moon occurs on the 1st.
- * New Moon occurs on the 8th.
- * First Quarter Moon occurs on the 15th.
- * Full Moon occurs on the 23rd.
- * Last Quarter Moon occurs on the 30th.

- * The Moon is at Perigee on the 7th, 221,948 miles from Earth.
- * The Moon is at Apogee on the 21st, 252,379 miles from Earth.

Moon/Planet Pairs:

- * Venus passes 1.2° south of Spica on the 1st.
- * Mars passes 2° north of Spica on the 4th.
- * The Moon passes 8° south of Saturn on the 9th.
- * The Moon passes 5° south of Mars on the 11th.
- * The Moon passes 0.3° south of Venus on the 11th.
- * The Moon passes 5° north of Neptune on the 20th.
- * Jupiter passes 0.9° south of Uranus on the 22nd.
- * The Moon passes 7° north of Jupiter on the 23rd.
- * The Moon passes 6° north of Uranus on the 23rd.
- * Venus passes 6° south of Mars on the 29th.

For reference: The Full Moon subtends an angle of 0.5°.

The Planets & Dwarf Planets

Planetary Reports are generated by "TheSky" software. (<http://www.ki0ar.com/planrpts.html>) These reports provide predicted data for the planets on the first of each month for the current year. The rise and set times for the Sun and the Moon for each day of the month are also included in the reports. These reports have been optimized for the Denver, Colorado location, however, the times will be approximate for other locations on Earth.

(All times are local unless otherwise noted.)

* **Planetary Highlights for September** - Begin September with a glimpse of Saturn before it disappears into the twilight glow. Continue your evening viewing with Mars and Venus. Jupiter rises about the same time that Saturn sets. Jupiter makes its best appearance in almost 50 years. Uranus also lies within 2° of Jupiter and should still be relatively easy to spot. Mercury puts in a brief appearance in the morning sky just before sunrise.

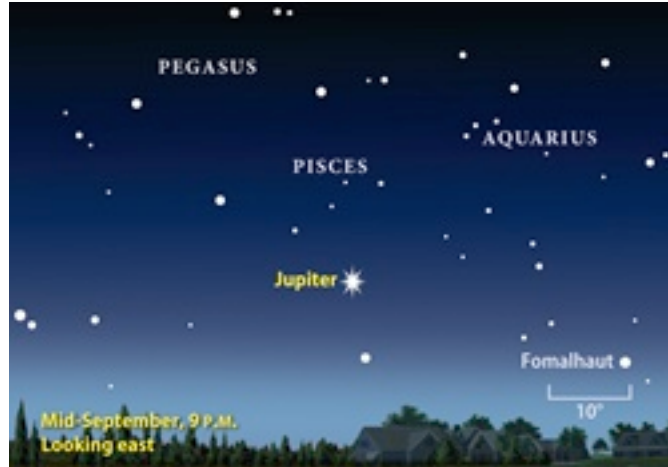
* **Mercury** - Is in inferior conjunction on the 3rd. Mercury is at greatest western elongation (18° above the eastern horizon) on the 19th. Mercury rises at 6:55 a.m. on the 1st and about 5:54 a.m. by month's end. Look for Mercury in the morning sky about mid-month. Mercury moves from the constellation of Sextans into Virgo this month shining at magnitude 0.5.

* **Venus** - Is at its greatest brilliancy on the 23rd, magnitude -4.8. Venus is visible in the west soon after sunset. Venus sets at 9:02 p.m. on the 1st and about 7:33 p.m. by month's end. Venus is in the constellation of Virgo this month.

* **Earth** - The Autumnal Equinox occurs at 11:09 p.m. EDT on the 22nd.

* **Mars** - Sets at 9:09 p.m. on the 1st and about 7:33 p.m. by month's end. Mars keeps pace with Venus all month, so watch our nearest planetary neighbors within a few degrees of each other all month long. Mars is in the constellation of Virgo this month shining at magnitude 1.5.

* **Jupiter** - Is at opposition on the 21st, rising as the Sun sets. Jupiter rises is 8:21 p.m. on the 1st and about 6:14 p.m. by month's end. Jupiter rises about the same time as Saturn sets this month. Look for Jupiter in the east and south in the evening and late evening. Jupiter is in the constellation of Pisces this month shining at magnitude -2.9.



* **Saturn** - Is in conjunction with the Sun on the 30th. Saturn rapidly disappears into the evening twilight glow as the month progresses, so catch a glimpse of Saturn soon after sunset during the first half of the month. Saturn sets at 8:38 p.m. on the 1st and about 6:48 p.m. by month's end. Look for Saturn in the evening low in the west after sunset. Saturn is in the constellation of Virgo shining at magnitude 1.0.

* **Uranus** - Is at opposition on the 21st, rising as the Sun sets. This month, Uranus remains even closer to Jupiter than it did last month, less than 1° north of Jupiter. Uranus rises at 8:14 p.m. on the 1st and about 6:13 p.m. by month's end, preceding Jupiter by just a few minutes all month. Uranus is in the constellation of Pisces shining at magnitude 5.7.



* **Neptune** - Rises at 6:54 p.m. on the 1st and about 4:54 p.m. by month's end. Neptune will be well above the eastern horizon by sunset this month making it a little easier to spot in the evening sky. Neptune is in the constellation of Capricornus this month shining at magnitude 7.8.

Dwarf Planets

* **Ceres** - Sets at 11:01 p.m. on the 1st and about 9:27 p.m. by month's end. Ceres moves into the constellation of Sagittarius this month shining at magnitude 8.8.

* **Pluto** - Sets at 1:28 a.m. on the 1st and about 11:26 p.m. by month's end. Pluto is in the constellation of Sagittarius shining at magnitude 14.0.

As always, good luck at spotting these two, a large telescope and dark skies will be needed.

Astronomical Events

Meteor Showers

* No significant meteor shower activity this month, but you can expect to see from 1 to 6 meteors per hour early in the month.

* For more information about Meteor Showers, visit Gary Kronk's Meteor Showers Online web page at [http://
meteorshowersonline.com/](http://meteorshowersonline.com/).

Comets

* "Comet 103P/Hartley could hit the headlines in the next 2 months. First, the comet comes closest to both the Sun and Earth in October's second half, when observers should get nice views through binoculars and telescopes and might glimpse it with naked eyes. Then, in early November, NASA's Deep Impact spacecraft will fly past the comet.



Currently, Comet Hartley is brightening quickly as it approaches Earth. Astronomers expect it to reach 10th magnitude by late September. The best views will come under a dark sky starting around the 24th. The comet then lies in Cassiopeia, south of

that constellation's familiar W-shaped asterism, and remains visible all night." (from Astronomy Magazine, September 2010, P. 42.)

* For information, orbital elements and ephemerides on observable comets visit the Observable Comets page from the Harvard-Smithsonian Center for Astrophysics (<http://cfa-www.harvard.edu/iau/Ephemerides/Comets/index.html>).

* For more information about Comets, visit Gary Kronk's Cometography.com web page at <http://cometography.com/>.

Eclipses

* No eclipse activity this month.

Observational Opportunities

* Jupiter appears at its best and brightest than it has since 1963 on the evening of the 21st. Jupiter will shine at magnitude -2.9 and subtends about 49.9 seconds of arc.

* While observing Jupiter, scan the nearby sky with a good pair of binoculars and spot Uranus within 1° north of Jupiter.

Asteroids (From west to east)

* **Flora** is at opposition on the 10th in the constellation of Aquarius.

* **Laetitia** is at opposition on the 14th in the constellation of Pisces.

* **Hebe** is at opposition on the 21st in the constellation of Cetus.

* **Iris** is in the constellation of Gemini.

* Information about the Minor Planets can be found at <http://www.minorplanetobserver.com> the Minor Planet Observer web site.

Occultations

* Information on various occultations can be found at <http://lunar-occultations.com/iota/iotandx.htm> , the International Occultation Timing Association's (IOTA) web site.

Planetary/Lunar Exploration Missions

(Excerpts from recent mission updates)

* **Cassini** - Aug. 26, 2010

Cassini Significant Events 08/18/10 - 08/24/10

"Wednesday, August 18 (DOY 230)

Today marked the 11th anniversary of Cassini's Earth flyby.

Friday, August 20 (DOY 232)

Spacecraft Operations (SCO) successfully completed real time commanding to load Command & Data Subsystem (CDS) flight software (FSW) V10.0 patches. This is the last planned software update for CDS FSW for the remainder of the Cassini Mission. The command loss timer will be set back to 110 hours on Sunday.

SCO completed the first long reaction wheel rest period during the CDS FSW uplink and checkout period. The objective for these wheel rest periods is to allow for a redistribution of lubricants within the bearing assemblies. Bearing consultants have recommended this approach to mitigate against increased friction in the bearings, but at this point there is still insufficient data to judge the effectiveness of this plan. Attitude control was switched from reaction wheels to thrusters on Aug. 18, and switched back to wheels today.

Monday, August 23 (DOY 235)

The Science Forum for S66 was held today. Topics included an overview of science planned for this sequence followed by highlights, unique activities, and highest priority observations as described by the Target Working Team (TWT) and Orbiter Science Team (OST) leads, with comments from the Investigation Scientists and other instrument team representatives.

Tuesday, August 24 (DOY 236)

This week the Radio Science team performed an operational readiness test with the DSN in preparation for the occultation observation on Sept. 2. The Magnetospheric and Plasma Science instruments performed an 11.5 hour survey. The Composite Infrared Spectrometer performed an 8 hour spectroscopic observation of the infrared star CW Leonis. The Cosmic Dust Analyzer continued its interstellar dust campaign."

Cassini Imaging Team's website - <http://ciclops.org>.

For the latest mission status reports, visit <http://saturn.jpl.nasa.gov/home/index.cfm>. The speed and location of the spacecraft can be viewed on the "Present Position" web page. (<http://saturn.jpl.nasa.gov/operations/present-position.cfm>)

*** New Horizons - No new news since July 27, 2010**
LORRI Looks Back at "Old Friend" Jupiter

"In early 2007 New Horizons flew through the Jupiter system, getting a speed-boost from the giant planet's gravity while snapping stunning, close-up images of Jupiter and its largest moons.

Fast forward to 2010 and New Horizons has given us another glimpse of old friend Jupiter, this time from a vantage point more than 16 times the distance between Earth and the Sun, and almost 1000 times as far away as when New Horizons reconnoitered Jupiter. While the planet is too far for the camera to pick up the swirling clouds and brewing, Earth-sized storms it saw just three years ago, "the picture is a dramatic reminder of just how far New Horizons, moving about a million miles a day, has traveled," says mission Principal Investigator Alan Stern, of the Southwest Research Institute.

http://pluto.jhuapl.edu/news_center/news/pictures/20100727/20100727_LORRILooksBack_lg.jpg"

New Horizons gallery <http://pluto.jhuapl.edu/gallery/sciencePhotos/>.

For more information on the New Horizons mission - the first mission to the ninth planet - visit the New Horizons home page: <http://pluto.jhuapl.edu/>.

*** Dawn - No new news since June 29, 2010**
Engineers Assess Dawn's Reaction Wheel

"Engineers are studying the reaction wheels on NASA's Dawn spacecraft after automatic sensors detected excess friction building up in one of them and powered it off early on the morning of June 17, 2010. Reaction wheels spin to help a spacecraft maintain attitude control, and Dawn, which is exploring the asteroid belt, uses three wheels in normal operations.

The three other reaction wheels are functioning normally. Mission managers said plans for Dawn to visit the asteroid Vesta in 2011 and 2012 and dwarf planet Ceres in 2015 will not be not affected."

For more information on the Dawn mission, visit the Dawn home page: http://www.nasa.gov/mission_pages/dawn/main/index.html.

* **MESSENGER** - August 17, 2010

Vulcanoid Search Continues as MESSENGER Reaches Orbital Perihelion

"Today MESSENGER will pass within 0.308 astronomical units (AU) of the Sun (one AU is Earth's distance from the Sun, approximately 150 million kilometers or 93 million miles), providing MESSENGER scientists with another opportunity to search for vulcanoids. Named after the hypothetical planet Vulcan, whose existence was disproven in 1915, vulcanoids are asteroids that orbit the Sun inside the orbit of the planet Mercury.

No vulcanoids have yet been discovered, and it is not known if any exist. But should they be found, these small, rocky asteroids may yield insights into the formation and early evolution of the solar system. They might contain material left over from the earliest period of planet formation and help determine the conditions under which the terrestrial planets, particularly Mercury, formed. Vulcanoids would also represent an additional population of impactors that contributed to the cratering history of Mercury much more than that of any other body. Impacts by vulcanoids would make the planet's surface appear older, relative to the surfaces of the Moon and other inner planets, than it actually is."

For more information on the MESSENGER mission, visit the MESSENGER home page: <http://messenger.jhuapl.edu/>.

* **Pack Your Backpack**

Calling all explorers! Tour JPL with our new Virtual Field Trip site. Stops include Mission Control and the Rover Lab. Your guided tour starts when you select a "face" that will be yours throughout the visit. Cool space images and souvenirs are all included in your visit.

+ <http://virtualfieldtrip.jpl.nasa.gov/>

* Past, Present, Future and Proposed JPL Missions - <http://www.jpl.nasa.gov/missions>.

* For special JPL programs and presentations in your area visit the JPL Solar System Ambassador web site at <http://www2.jpl.nasa.gov/ambassador/index.html>.

Mars Missions

* **Mars Odyssey Orbiter** - No new news since July 23, 2010
NASA Spacecraft Camera Yields Most Accurate Mars Map Ever

"PASADENA, Calif. - A camera aboard NASA's Mars Odyssey spacecraft has helped develop the most accurate global Martian map ever. Researchers and the public can access the map via several websites and explore and survey the entire surface of the Red Planet.

The map was constructed using nearly 21,000 images from the Thermal Emission Imaging System, or THEMIS, a multi-band infrared camera on Odyssey. Researchers at Arizona State University's Mars Space Flight Facility in Tempe, in collaboration with NASA's Jet Propulsion Laboratory in Pasadena, Calif., have been compiling the map since THEMIS observations began eight years ago.

The pictures have been smoothed, matched, blended and cartographically controlled to make a giant mosaic. Users can pan around images and zoom into them. At full zoom, the smallest surface details are 100 meters (330 feet) wide. While portions of Mars have been mapped at higher resolution, this map provides the most accurate view so far of the entire planet.

The new map is available at: http://www.mars.asu.edu/maps/?layer=thm_dayir_100m_v11."

"A simulated fly-through using the newly assembled imagery is available online at http://www.nasa.gov/mission_pages/mars/missions/odyssey/20060313.html.

The fly-through plus tools for wandering across and zooming into the large image are at <http://themis.asu.edu/>."

DAILY MARS ODYSSEY THEMIS IMAGES

Thermal Emission Imaging System (THEMIS) web site: (<http://themis.la.asu.edu/latest.html>)

The Odyssey data are available through a new online access system established by the Planetary Data System at: <http://starbrite.jpl.nasa.gov/pds/>

Visit the Mars Odyssey Mission page at <http://mars.jpl.nasa.gov/odyssey/index.html>.

* **Mars Exploration Rover Mission** (Spirit and Opportunity) - August 25, 2010

SPIRIT UPDATE: Spirit Remains Silent at 'Troy' - sols 2356-2361, August 19-24, 2010:

"Spirit remains silent at her location on the west side of Home Plate. No communication has been received from the rover since Sol 2210 (March 22, 2010).

It is likely that Spirit has experienced a low-power fault and has turned off all sub-systems, including communication and gone into a deep sleep, trying to recharge her batteries. There is the additional risk that the rover may trip a mission clock fault. To respond to either case, the project is both listening for Spirit with the Deep Space Network and Mars Odyssey orbiter for autonomous recovery communication from the low-power fault case, and conducting a "Sweep & Beep" strategy to stimulate the rover in the case of a mission clock fault.

Although power levels are estimated to be improving with the advancing springtime in the southern hemisphere of Mars, atmospheric conditions historically deteriorate (higher atmospheric opacity) at this time. So, a response from Spirit is still not expected for some time.

Total odometry is unchanged at 7,730.50 meters (4.80 miles)."

OPPORTUNITY UPDATE: Opportunity Stops to Check Out Rocks - sols 2336-2341, August 19-25, 2010:

"Opportunity has paused in her trek toward Endeavour crater to examine an exposed outcrop of rock that is of interest to the science team.

On Sol 2336 (Aug. 19, 2010), the rover performed a 7-meter (23-foot) backward turn with a forward bump to approach the outcrop contact. On the next sol, Opportunity performed a short turn to place surface targets within reach of the robotic arm

(Instrument Deployment Device, IDD). On Sol 2339 (Aug. 23, 2010), Opportunity conducted a relay test pass with Mars Express as part of a regular checkout of the Mars Express relay. On the next sol, the rover used the robotic arm to collect a microscopic imager (MI) mosaic of a surface target, called "Clarín Beach," which was followed by a placement of the alpha particle X-ray spectrometer (APXS) on the same target for integration. On Sol 2341 (Aug. 25, 2010), Opportunity continued the investigation of this outcrop contact, collecting another set of microscopic imager mosaics of new targets and then a placement of the APXS on a target called "Duero Beach."

As of Sol 2340 (Aug. 24, 2010), solar array energy production was 562 watt-hours with atmospheric opacity (τ) of 0.334 and the solar array dust factor of 0.7285.

Total odometry as is 22,647.85 meters (22.65 kilometers, or 14.07 miles)."

Landing sites link - <http://marsoweb.nas.nasa.gov/landingsites/>

Visit the Mars Exploration Rover page at <http://marsrovers.jpl.nasa.gov/home/index.html>.

*** Mars Reconnaissance Orbiter Mission - August 04, 2010
Hundreds of New Views from Telescope Orbiting Mars**

"The latest set of new images from the telescopic High Resolution Imaging Science Experiment Camera on NASA's Mars Reconnaissance Orbiter offers detailed views of diverse Martian landscapes.

Features as small as desks are revealed in the 314 observations made between June 6 and July 7, 2010, now available on the camera team's site (<http://hirise.lpl.arizona.edu/>) and NASA's Planetary Data System (<http://pds.jpl.nasa.gov/>)."

MARS RECONNAISSANCE ORBITER HIRISE IMAGES

All of the HiRISE images are archived here: <http://hirise.lpl.arizona.edu/>.

More information about the MRO mission is available online at <http://www.nasa.gov/mro>.

* Mars Missions Status - New Mars missions are being planned to include several new rover and sample collection missions. Check out the Mars Missions web page: <http://mars.jpl.nasa.gov/missions/> and the Mars Exploration page: <http://marsprogram.jpl.nasa.gov/>.

Links and Other Space News

(If you have a link you would like to recommend to our readers, please feel free to submit it.)

*** **NEW** *** **Astronomy A-Go-Go** - <http://astronomy.libsyn.com/>
In the car, at work or under the night time sky astronomy goes where you go!

* **"TheSky" Software** - <http://www.bisque.com>

* **A Short Guide to Celestial Navigation** - <http://www.celnav.de/>

* **Astrogirl Homepage** - <http://www.astrogirl.org>

* **Astronomical Lexicon** - <http://www.ki0ar.com/astrolex.html>
Many of the astronomical terms used in this newsletter are defined here.

* **Astronomy Picture of the Day** - <http://antwrp.gsfc.nasa.gov/apod/astropix.html>

* **Black Hole Encyclopedia** - <http://blackholes.stardate.org/>
Excellent site from StarDate - University of Texas McDonald Observatory (<http://mcdonaldobservatory.org/>)

* **Celestron Telescopes** - <http://www.celestron.com/c2/index.php> -
New beta website

* **Cloudbait Observatory**, Guffey Colorado - <http://www.cloudbait.com> - Submit your fireball reports here.
Interesting, knowledgeable site.

* **The Constellations and Their Stars** - <http://www.astro.wisc.edu/~dolan/constellations/constellations.html>
Good site for finding out more about the 88 constellations and their associated stars.

- * **Denver Astronomical Society** - <http://www.denverastrosociety.org>
- * **Distant Suns** - <http://www.distantsons.com/>
Desktop Astronomy package for PCs.
- * **Eric's Black Sun Eclipse website** - <http://www.ericblackseclipse.com>
- * **Groovy Adventures** - <http://www.groovyadventures.com>
Unique adventures and vacations including astronomy related vacations.
- * **The International Dark-Sky Association** - <http://www.darksky.org>
To preserve and protect the nighttime environment and our heritage of dark skies.
- * **JPL Solar System Ambassador Program** - <http://www.jpl.nasa.gov/ambassador/front.html>
- * **JPL Solar System** - http://www.jpl.nasa.gov/solar_system/
- * **Meade Advanced Products Users Group** - <http://www.mapug-astronomy.net/> - Mapug-Astronomy Topical Archive & information resource, containing a massive 335 page archive of discussions about Meade equipment, and much more: observatories, observing lists, permanent piers, equatorial wedges, remote operations, software, eyepieces, etc.
- * **My Stars Live** - <http://www.mystarslive.com/>
Interactive Star Chart
- * **NASA Science News** - <http://science.nasa.gov/>
- * **Northern Colorado Astronomical Society** - <http://ncastro.org/>
- * **Sangre Stargazers** - <http://sangrestargazers.skymtn.com/> - New astronomy club in the Wet Mountain Valley of Custer County (about 45 miles due west of Pueblo, CO).
- * **Sky and Space** - <http://www.skyandspace.com.au/public/home.ehtml>
Astronomy from Down Under - The Southern Hemisphere's first astronomy and space magazine.

* **Skymaps.com** - <http://www.skymaps.com/>

* **Skywatch Sightings from NASA** - <http://spaceflight.nasa.gov/realdata/sightings/>

This site gives you the best times to watch the ISS pass over or near your location.

* **Southern Colorado Astronomical Society** - <http://www.scasastronomy.info/>

* **Space.com** - <http://space.com>

Interesting space and astronomy articles.

* **Space.com** - Sky Watch Calendar - http://www.space.com/spacewatch/sky_calendar.html

* **Spaceflight Now** - <http://spaceflightnow.com/>

* **"SpaceRef.com"** - <http://www.spaceref.com/> - SpaceRef's 21 news and reference web sites are designed to allow both the novice and specialist alike to explore outer space and Earth observation.

This site includes links to planetary updates such as Mercury Today, Venus Today, Earth Today, Moon Today, Mars Today, Jupiter Today, Saturn Today, Pluto Today, etc.

* **Stellarium** - <http://www.stellarium.org>

Free, downloadable planetarium/astronomy software.

* **Universe Today** - <http://www.universetoday.com>

* **Wikisky** - <http://www.wikisky.org>

WIKISKY is a non-commercial project. The main purpose of WIKISKY is to consolidate astronomical, astrophysical and other information about different space objects and astrophysical facts.

Acknowledgments and References

Much of the information in this newsletter is from "Astronomy Magazine" (Kalmbach Publishing), JPL mission status reports, "Meteor Showers - A Descriptive Catalog" by Gary W. Kronk and other astronomical sources that I have stashed on my book shelves.

The author will accept any suggestions, constructive criticisms, and corrections. Please feel free to send me any new links or articles to share as well. I will try to accommodate any reasonable requests. Please feel free to send questions, comments, criticisms, or donations to the email address listed below. Enjoy!

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- Full documentation of the online administration system is available at <http://www.freelists.org/help/>. We encourage you to get the most out of the web interfaces, and we encourage subscribers to do the same. Please let your list members know about the advantages of exploring the FreeLists Web Login.
- The latest version of the newsletter is accessible from <http://www.ki0ar.com/astro.html>.

Keep looking UP!

73 from KI0AR

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