

Starscan

Johnson Space Center
Astronomical Society

Volume 24, Number 6 June 2008



**WE MADE THE HOUSTON CHRONICLE—
"ATTENDING AN AMATEUR ASTRONOMY
STAR-PARTY"
AND A FEW STARS WERE BORN....**

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Message from the el Presidente

Troops: Best wishes and safe travel to those (of any Club) heading to the Texas Star Party this year. I hope it isn't too hot and I hope you avoid the weather and lightning I heard about from last year! I hope someone will put together a TSP snippet for next month, of course from a JSCAS point of view.

Remember, this month (June) we are **meeting at Space Center Houston in the Zero G-Diner!!!** A special thanks to SCH for helping us out with an alternate meeting location.

Thanks to those that came out for the LPI star party. Most of all, thanks to Matt and Lisa Hommel who keep that educational vigil and connection going with the LPI.

Don't forget, we have a Moody Gardens Star Party on June 28th!

Clear skies everyone! David

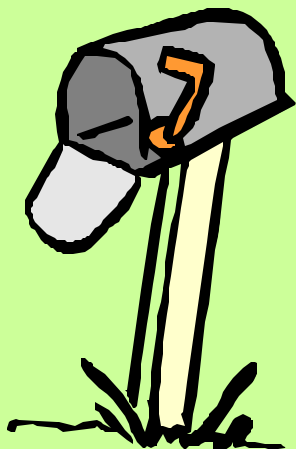
LETTER FROM THE EDITOR

By Connie Haviland

This month is a quiet month, but there were some interesting activities. Check out the article that spoke about our club and star-parties. Hopefully, this will spark some interests with astronomy and our club will begin to flourish and grow some more. I decided to add some information and activities for the kiddos, regarding Space Weather. With Summer here and the weather getting hotter, I thought it would be fun to learn about what goes on above us. I plan on building on this subject matter this summer, which will include articles about the Sun. Have fun, clear skies and not too many mosquitoes..

LETTER TO THE EDITOR

NONE THIS MONTH!!!!



Star Parties for 2008

By John Erickson

JUNE

June 01-08 - Texas Star Party
June 28 - Moody Gardens Star Party

JULY

July—No Star Party

AUGUST

August –No Star Party

SEPTEMBER

September 06 - Moody Gardens Star Party
September 27 - Haak Winery Star Party

OCTOBER

October 18 - Astronomy Day @ George Observatory
October 23 to 26 - Fort Mckavett StarParty

NOVEMBER

November 01 - Haak Winery Star Party

DECEMBER

December 12 - No Star Party



If you didn't see it in the Houston Chronicle, here is an article that mentioned US!!

Starry-eyed evenings - Local amateur astronomers setting up telescopes around the city to host 'star parties'

By TARA DOOLEY



Saturn is the gateway planet of the Houston skies. Sometimes all it takes is a single exposure, just one look through a telescope at the bright light with its rings and moons, to lure the vulnerable.

From Saturn, it's on to Mars. And the next thing you know, the unsuspecting will be hooked into a lifetime of searching the night skies for galaxies, nebulae, clusters and shiny objects listed in catalogs created by those whose lives took a similar turn hundreds of years ago.

"Saturn will do it to you," said Connie Haviland of Pearland. "I saw the rings of Saturn and I went,

'Whoa,' and it got me started."

Haviland now shares the hobby with her husband, David, president of the Johnson Space Center Astronomical Society, and just about anyone else interested enough to look through her telescope.

On a recent Wednesday evening, the Havilands were on the grounds of the Universities Space Research Association campus in Clear Lake with three members of the society in the hopes of drawing in children.

This particular crowd was an easy mark. The group of 5- to 15-year-old smart kids had been organized by Texas Parents of the Profoundly Gifted and was gathered for a lecture on black holes. For most, it wouldn't be their first celestial rodeo.

But just as the telescopes, some homemade and others operated by intricate computer systems, were set up, the clouds rolled in and covered the skies.

Kids didn't see stars, and the grown-ups missed out on a chance to show a bit of the universe to an enthusiastic crowd.

But then, most audiences are enthusiastic, David Haviland said. The sense of awe keeps many an amateur astronomer interested in lugging out the heavy equipment in the hopes of initiating newcomers.

"If it is a good scope and it is crisp and clear, you can just hear the jaws drop," he said. Despite the refineries, strip centers, homes and businesses that pollute the darkness of the night sky, thousands of local amateur astronomers set up telescopes in green patches around the city for "star parties," a mixture of social gathering and intellectual exchange.



Many are informal affairs such as the neighborhood ones hosted by Ken Fraley. He's just a guy with an 8-inch reflecting telescope who periodically sends out an invitation on the Woodland Heights' Internet bulletin board. Neighbors, dog walkers, joggers and children in PJs making a final stop before bedtime arrive on the Norhill Esplanade to get a closer look at the skies.

Others are mostly for amateur astronomy clubs, including the Houston Astronomical Society and the North Houston and Fort Bend Astronomy clubs.

Sunday, one of the largest in the country, The Texas Star Party, kicks off in West Texas near Fort Davis. The annual festival of amateur stargazers draws crowds from around the world. For astronomers from the Houston area, the week offers skies unblemished by the ever-expanding intrusion of urban light.

"The pollution from the city lights limits what you can see here," said Johnson Space society member Jim Cate, who will take his 16-inch telescope to West Texas for the star party next week. "You can see the planets. Out there it is a world of difference. The sky is filled with stars."

The Houston Astronomical Society, for example, offers "star parties" for schools and other educational programs close to home. About four times a year, the society holds parties for members and guests at a spot in Columbus where the skies are not as polluted, said Bill Flanagan, the society treasurer.

"In the city it is kind of limited in the things you can do," he said. "You can look at the moon and the planets, which are interesting, but the light blocks out the deep sky things like the galaxies."

An oasis closer to home is Brazos Bend State Park and its George Observatory, where the night sky still offers astronomers a good view the stars. The observatory, part of the Houston Museum of Natural Science, boasts a 36-inch research telescope that can take the amateur eye deep into the sky on Saturday nights, when it is open to the public, said manager Barbara Wilson.



of

On those nights, volunteers from the Fort Bend Astronomy Club also set up smaller telescopes on the outdoor observation deck and let the public take a peek.



Dennis Borgman, for example, gives lunar tours from his telescope, pointing out craters, fault lines and the location of the Apollo landings.

"Most people have been looking at the moon for most of their lives," he said. "You point out something new to them and you see a smile on their faces."

For many a stargazer, the interest was sparked in childhood. For some, it was a first look at Saturn, or in Wilson's case, Mars. David Haviland remembers being fascinated by the Apollo missions and especially the first moon landing as a child, though he received his first telescope as a gift when he was an adult. Others were introduced in scouting or school programs.

First inspiration launched an adult interest that grew with every new star cluster discovered or galaxy observed, amateurs said. But the passion for the hobby is fueled by a recognition that looking into the night sky is a way of observing millions of years of history. It is also a continued sense of wonder, Cate said. "To me it is part of creation," he said. "It is part of what is out there. There is a lot of science involved and there is a lot of mystery involved. It is just mysterious and beautiful."

And fun.

That's part of the reason Fraley periodically drags his telescope onto the Norhill Esplanade to share the view. On a recent evening, even without the official invitation, the telescope drew an impromptu crowd of neighbors, many of them Fraley's regulars.

As the skies turned from dark blue to night, Fraley pointed his telescope directly at Saturn and watched as the line formed to look in the viewer. Repeated expressions of amazement followed. Said Michael Brewster, for one, "I've never seen anything like that in my life."

tara.dooley@chron.com Copyright 2008 Houston Chronicle

Editor's note: I want to thank everyone who was a part of this star-party at the LPI. It isn't always easy to make an event during the week, with work and family and to give of your time so that we are part of the community is really great. These pictures will show who all were there and I want to thank them for doing

this for our club.







JUNE OBSERVING

★ **SSO:** (Solar System Objects) Summary for the 15 June 08

Object	Const	Mag	% Ill	Rise Time	Transit	Set Time
Sun	<u>Tau</u>	-26.7	100	06:20	13:20	20:21
Mercury	<u>Tau</u>	3.1	6	05:48	12:33	19:21
Venus	<u>Tau</u>	-3.9	100	06:31	13:30	20:34
Mars	Leo	1.6	93	10:38	17:16	23:59
Jupiter	<u>Sgr</u>	-2.7	100	22:03	03:12	08:21
Saturn	Leo	0.8	100	11:36	18:05	00:38
Uranus	<u>Aqr</u>	5.8	100	01:24	07:17	13:11
Neptune	Cap	7.9	100	00:00	05:30	11:00
Pluto	<u>Sgr</u>	13.9	99	20:22	01:44	07:06

Highlighted times denote daylight events.

Lunar phases for June 08

New 	First 	Full 	Third 
03 rd 14:23	10 th 10:04	18 th 12:30	26 th 07:10

Central Daylight Time

Meteor showers for June 08

Shower	Activity Period	Maximum Activity
June <u>Bootids</u> (JBO)	Jun 22-Jul 02	27-June

★ **BSO:** (Bright Sky Objects)

NGC 5662 (Mel 127, Cr 284) - Open Cluster in Centarus, Magnitude 5.5, Size 12.0', 70 Stars

NGC 5460 (Mel 123, Cr 280) - Open Cluster in Centarus, Magnitude 5.6, Size 25.0', 40 Stars

NGC 5904 (M 5) - Globular Cluster in Serpens, Magnitude 5.8, Size 17.4

NGC 5822 (Mel 130, Cr 289) - Open Cluster in Circinus/Lupus, Magnitude 6.5, Size 39.0', 150 Stars

★ **DSO:** (Dark Sky Objects)

NGC 5823 (C 88, Mel 131, Cr 290) - Open Cluster in Circinus, Magnitude 7.9, Size 10.0', 100 Stars

NGC 5925 (Cr 291) - Open Cluster in Norma, Magnitude 8.4, Size 14.0', 120 Stars

NGC 5694 (C 66) - Globular Cluster in Hydra, Magnitude 10.2, Size 3.6'

NGC 5665 (Arp-49) - Galaxy in Bootes, Magnitude 12.7, Size 2.5' x 1.6'

★ **CDMP:** (Chris' Don't Miss Pick)

NGC 5457 (M 101, Apr 26) Pinwheel Galaxy in Ursa Major, Magnitude 7.7, Size 28.9' x 26.9'

Messier 101 (M101, NGC 5457) was discovered by Pierre Méchain on March 27, 1781, and added as one of the last entries in Charles Messier's catalog. It was one of the first "spiral nebula" identified as such, in 1851 by William Parsons, the third Earl of Rosse.

Although extended 22 arc minutes on photos and quite bright, only the central region of this galaxy is visible in smaller telescopes, best at low powers. Suggestions of the spiral arms can be glimpsed in telescopes starting from 4 inch as nebulous patches. Several of these patches (i.e., spiral arm fragments) were assigned their own catalog numbers by William Herschel and later observers.

On photographs, however, the Pinwheel Galaxy M101 is revealed as one of the most prominent Grand Design spirals in the sky. While quite symmetric visually and in very short exposures which show only the central region, it is of remarkable unsymmetry, its core being considerably displaced from the center of the disk. Halton Arp has included M101 as No. 26 in his Catalogue of Peculiar Galaxies as a "Spiral with One Heavy Arm".

M101 is the brightest of a group of at least 9 galaxies, called the M101 Group. The brightest companions are NGC 5474 to the SSE and NGC 5585 to the NE.

The distance of M101 has been determined by the measurement of Cepheid variables with the Hubble Space Telescope in 1994/95 to be about 24 +/- 2 million light years, by the HST H0 Key Project Team. According to the recent recalibration of the Cepheid distance scale, the "true" distance of M101 should be closer to a 10 percent higher value (27 million light years).

Three supernovae have been discovered in M101: The first one, SN 1909A, appeared on January 26, 1909 and was discovered by Max Wolf; it was of peculiar type and reached mag 12.1. The second supernova 1951H was of type II, occurred in September 1951 and reached mag 17.5, while the third, SN 1970G, also type II, was discovered on July 30, 1970 by Michael Lovas, and reached mag 11.5.

Historical Observations and Descriptions

Messier: March 27, 1781. 101 Nebula without star, very obscure & pretty large, of 6 or 7 minutes [of arc] in diameter, between the left hand of Bootes & the tail of the great Bear [Ursa Major]. It is difficult to distinguish when one lits the [graticule] wires. (diam. 7')

William Herschel: To these may added the 1st, 3d, 27, 33, 57, 79, 81, 82, 101 [M101] [of Messier's catalog], which in my 7, 10, and 20-feet reflectors shewed a mottled kind of nebulosity, which I shall call resolvable; so that I expect my present telescope will, perhaps, render the stars visible of which I suppose them to be composed.

John Herschel (1833): h 1744. : 5' Faint; very large; round; first gradually then very suddenly much brighter toward the middle; 5' [diameter].

Smyth: DIII [503]. M101 : "A pale white nebula, in the nebulous field *np* the right hand of Boötis; it is 5d north-north-east of Alkaid, and a similar distance east-half-south from Mizar. This object was discovered by Mechain in 1781, in whose instruments it was very obscure; and it only exhibited a mottled nebulosity to WH [William Herschel]. Under a very favourable view it is large and well spread, though somewhat faint except towards the center, where it brightens. There are several telescopic stars in the field, one of which is very close to the nebula. From the nature of this neighborhood, and a trifling uncertainty in the earlier data, this object may be 214 H I [this is actually NGC 5474]; but that astronomer does not appear to have been aware of the identity. It is one of those globular nebulae that seem to be caused by a vast agglomeration of stars, rather than by a mass of diffused luminous matter; and though the idea of too dense a crowd may intrude, yet the paleness tells of its inconceivable distance, and probable discreteness."

Lord Rosse : 8 observations. "Sketched 3 times. Mar. 1, 1851. Large spiral; faintish; several arms and knots; 14' across at least. See fig . 35, Plate XXIX." [A table with marked knots and positions follows]

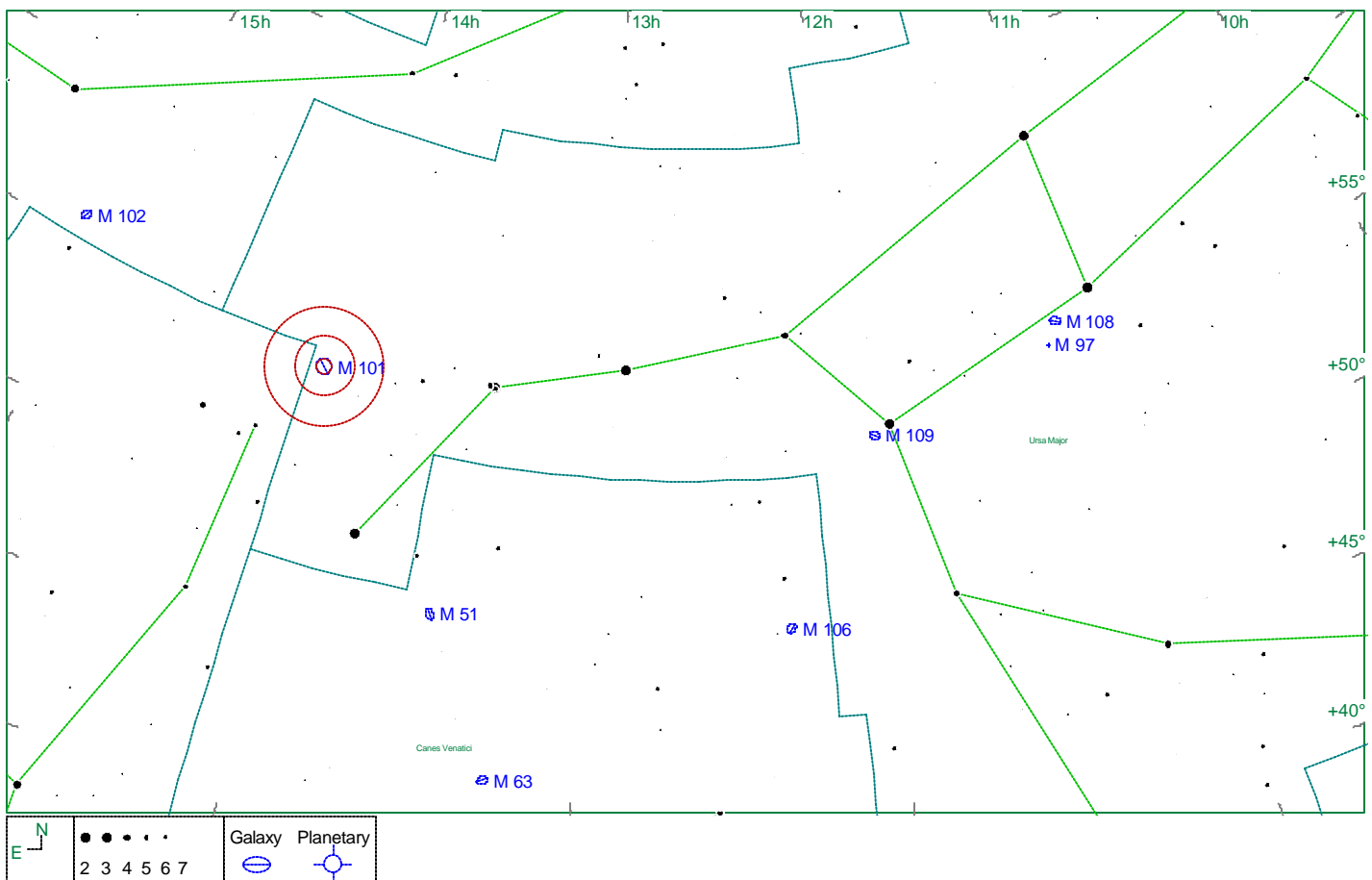
John Herschel, General Catalogue : GC 3770. :Pretty bright; very large; irregularly round; gradually, then very suddenly, much brighter toward the middle, where there is a bright small nucleus. Remarks: [with GC 3760 = 3766, 3762, 3763, 3764, 3767, 3771, 3773, 3774] h. 1744 = M.101, and its attendents in more or less intimate nebulous connexion. Of those in Lord Rosse's woodcut, PT 1861, p. 729, N, the

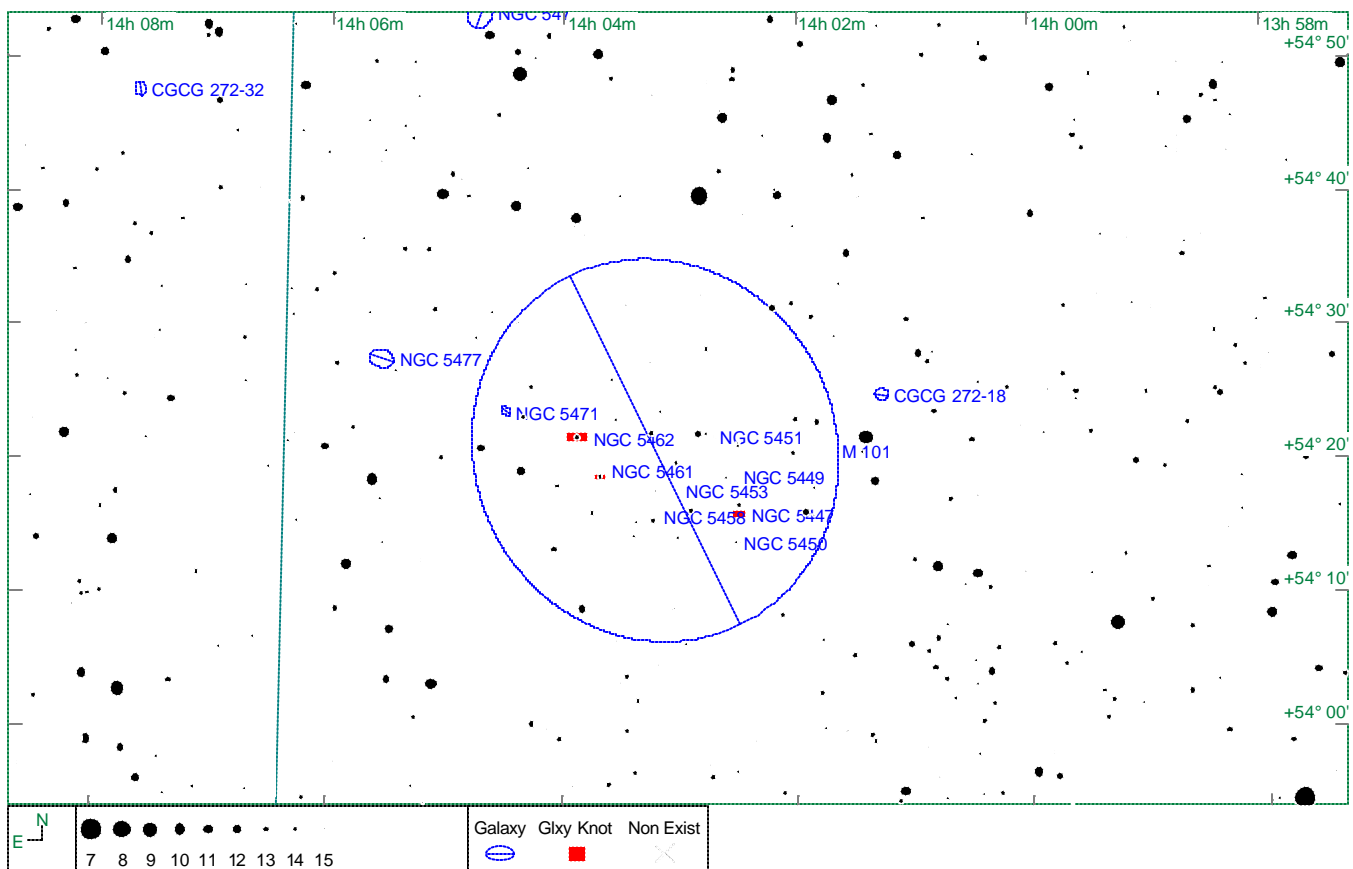
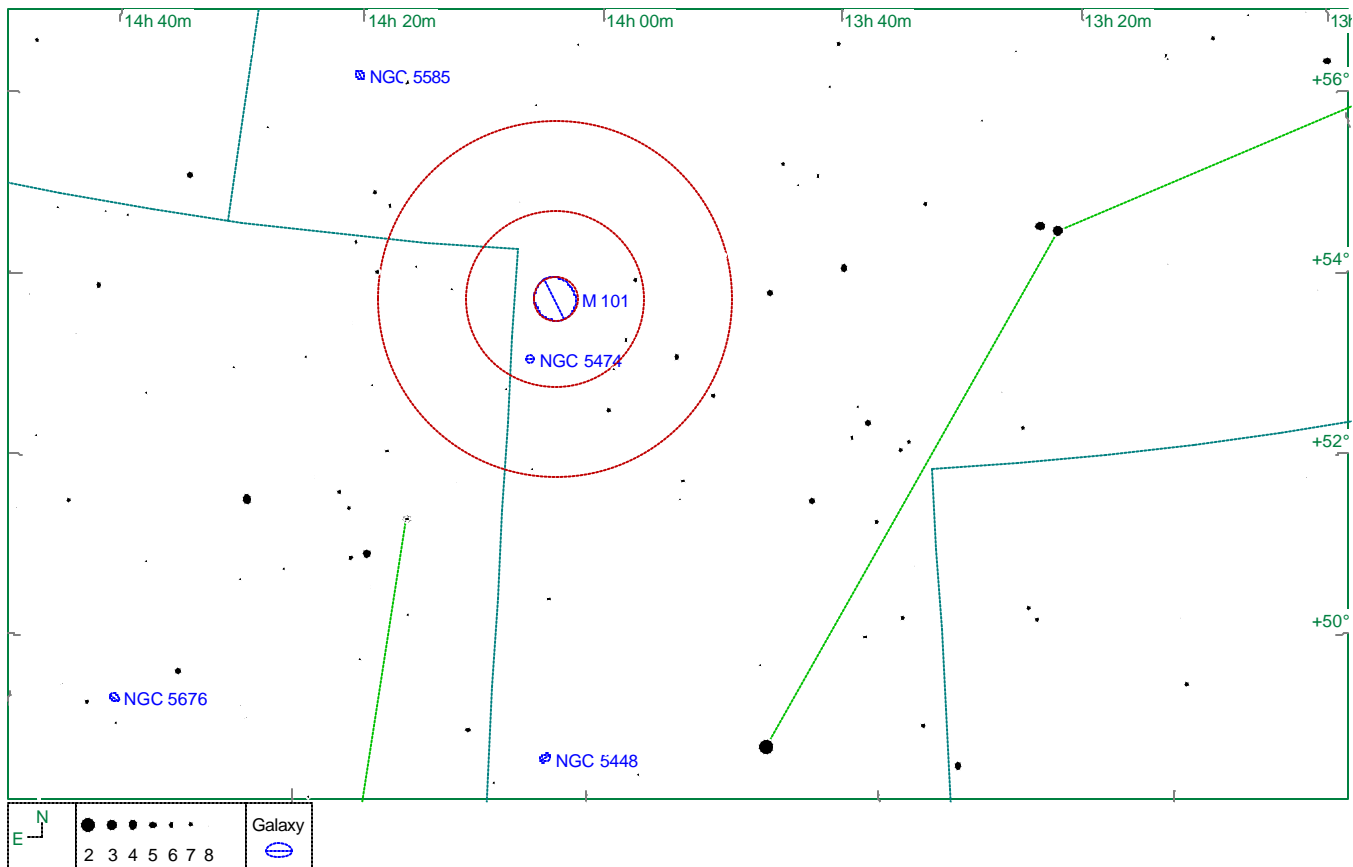
principle nucleus, is No. 3770 = h. 1774; n1 = No. 3774 = 1744, i; n2 No. 3773 = 1744, h. The others are not lettered, and are made out from the joint evidence of this diagram and the measures of the position and distance of the stars compared with the copper plate, fig. 35 - 1744, a is not improbably = [H] III.787.

Dreyer. NGC 5457. Pretty bright, very large, irregularly round, gradually, then very suddenly, much brighter toward the middle, where there is a bright small nucleus.

Curtis : This unusually beautiful spiral is about 16' in diameter. There is an almost stellar nucleus, with two bright condensations very close which give a tri-nuclear appearance. The open whorls show a multitude of stellar condensations. [NGCs] 5449, 5450, 5451, 5453, 5455, 5458, 5461, 5462, are simply brighter knots in the great nebula. 10 s.n.

For this and further info go <http://www.seds.org/> or <http://www.ngcic.org/> for more information





What's Happening at the George!!!

Cynthia Gustava

George Observatory June Events

Friday Night Groups (all times are 19:30 to 22:00)...Volunteers for domes and deck scopes are needed. Contact Cynthia Gustava at cynm31@comcast.net.

June 6 – Friday Night Group (FNG)...Aldine Teacher's Stargazing Night

June 20 – Brownie Overnight

June 27 – FNG...Cub Scout Pack 870 (80-100)

Saturday Night Public Viewing (dusk to 23:00)...Volunteers for domes and deck scopes are needed. Contact the building manager teams below.

June 7 – Cynthia Gustava and open position cynm31@comcast.net

June 14 – Tracy Knauss and Keith Rivich birdbarn2000@yahoo.com

June 21 – Mary Lockwood and Joe Mills mplockwood@att.net or k5jmm@yahoo.com

June 28 – Barbara and Buster Wilson bwilson@hmns.org or retsub@ix.netcom.com

Need volunteers



NEWS FROM AROUND THE CLUB

We have so many who are willing to help others, so we thought it would be nice to show their efforts.



These are comet Holmes and the North America Nebula region of Cygnus, taken by Andy Saulietis and processed by Al Kelly.



JSCAS LIBRARY & BOOK REVIEW

By Bob and Karen Taylor





FORT (Forward Observing Recon Team)

By Ken Lester (special operations team)

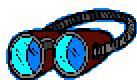


Well, Lisa and I have been communicating back and forth regarding her getting a position in the local schools. I want to announce that we now have a member of our club, working for Junction Elementary and I see trips to the school for presentations from our club while we are visiting Ft. Mac. CONGRATS LISA!!!! Here is what she had to tell me.....

Well, I received a phone call from the principal of Junction Elementary. She offered me a job teaching the Science Discovery classes to the 2nd -5th graders. I could barely hear her because she was in Harper, Texas standing outside the gym. She's going to call me back tomorrow with all the details but she wanted to offer me the job this evening! I'm so glad as I don't think I'd have slept if I didn't know something. If they do the Discovery program like they did this year I will have 1 class of students for 45 minutes and then they will go to PE or back to their regular class and I'll have another class for 45 minutes. This means I'll be planning lessons for 4 different grade levels each week but it will only be science and they have plans in place that I can use or change up (I guess). Since I love astronomy and am interested in most areas of science I think that I'm going to enjoy this!


I next evening I heard from the principal. She told me that she'd given my number to the secretary at the district office who would contact me about the paperwork. Then we talked at length about the position....what they had done with it the past 2 years and how they'd like to see it change. We discussed a few ideas, when I can come up during the summer to start going through the materials, etc. She closed with how excited everyone is that I'm going to take over this position and that they know that the students and the staff will learn a lot about science from me!

It wasn't until I got off the phone that I realized I don't know how much I'm getting paid. I hope to hear from the gal at the district office






We have had several things coming and going in previous months, but we don't have anything to post this month.



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"Bluebonnet" Country
Call: 713-569-7529

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JSCAS Mirror Lab

Matt Hommel

NOTHING THIS MONTH





M3

Date: 9+10.May 2008: seeing 5-7/10; Transp. 6-9/10

Scope: 5 " TMB Apo f/9

CCD: SXV H16 - 3 hours - luminance; 1x1 bin 6 darks; 3.5 hours

R,G,B 2x2 bin. 6 darks for 2x2bin.

Software: AstroArt4 image acqu. guiding. Maxim DL preprocessing

Processing: postprocess. PS CS2 and Pix InSight LE



Something really cool to check out....

ATV and ISS Tracking Website

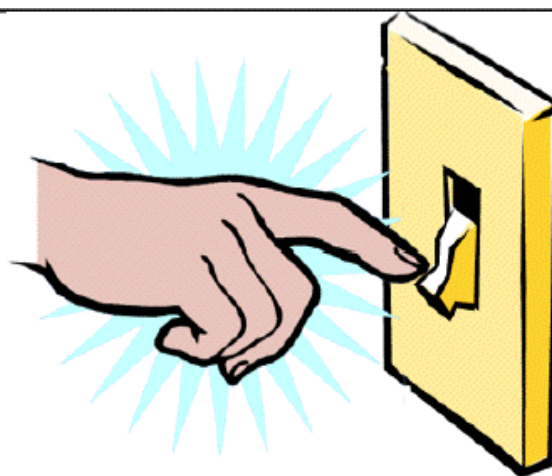
<http://www.lizard-tail.com/isana/tracking/index.html?&target=atv>

Help turn off the lights...

Join the
International Dark-Sky Association (IDA)

<http://www.darksky.org>

"To preserve and protect the nighttime environment and our heritage of dark skies through quality outdoor lighting."



Brazosport Astronomy Club

Meets the Third Tuesday of the month, 7:45p.m.

At the Planetarium

400 College Drive

Clute, Texas (For more information, contact Judi James at the Planetarium 979-265-3376)

Fort Bend Astronomy Club <http://www.fbac.org>

Meets the third Friday of the month, 7:00 p.m.

First Colony Conference Center

3232 Austin Pkwy

Sugarland, Texas

Houston Astronomical Society <http://spacibm.rice.edu/~has>

Meets the first Friday of the month, 8:00 p.m.

University of Houston, University Park

Science and Research Building, Room 117

North Houston Astronomy Club <http://www.astronomyclub.org>

Meets the fourth Friday of the month, 7:30 p.m.

In the Teaching Theatre at Kingwood College

20000 Kingwood Drive

Kingwood, Texas

Houston

Area

Astronomy

Clubs

Johnson Space Center Astronomical Society

2008-Club Officers

President – David Haviland
Vice President – Chris Randall
Secretary – David Haviland
Starscan Editor – Connie Haviland
Star Party Chairperson – John Erickson
Librarian – Bob and Karen Taylor
Historian – Susan De Chellis
Scientific Expeditions – Paul Maley
Web Master—Chris Randall

SIGS

Observing Awards – Triple Nickel
Astronomy 101 — Triple Nickel
CCD Imaging – Al Kelly
Binocular Observing – “OPEN”
Telescope Making – Bob Taylor
Deep Sky Observing – Chris Randall

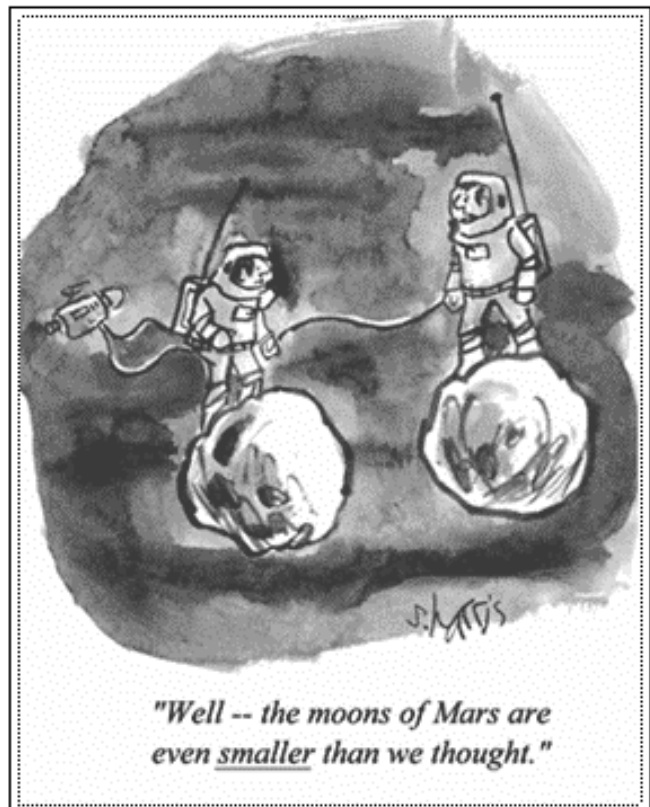
Starscan Submission Procedures

Original articles of some relation to astronomy will be accepted up to 6 p. m. (18:00 hrs) on the 25th of each month. THE most convenient way to submit articles or a Calendar of Events is by email and is preferred, but hard copies (CD, disk) are also accepted. All articles must include author's name and phone number. Also include any picture credits. Word, WordPerfect, and text files will be accepted. I have set up a special email account so that I can keep all of the Starscan articles, pictures, information, etc, separate from all of the other email I get. This makes it much easier to edit and set up the Starscan

Please send all submissions to:

conniesstarscanaccount@gmail.com

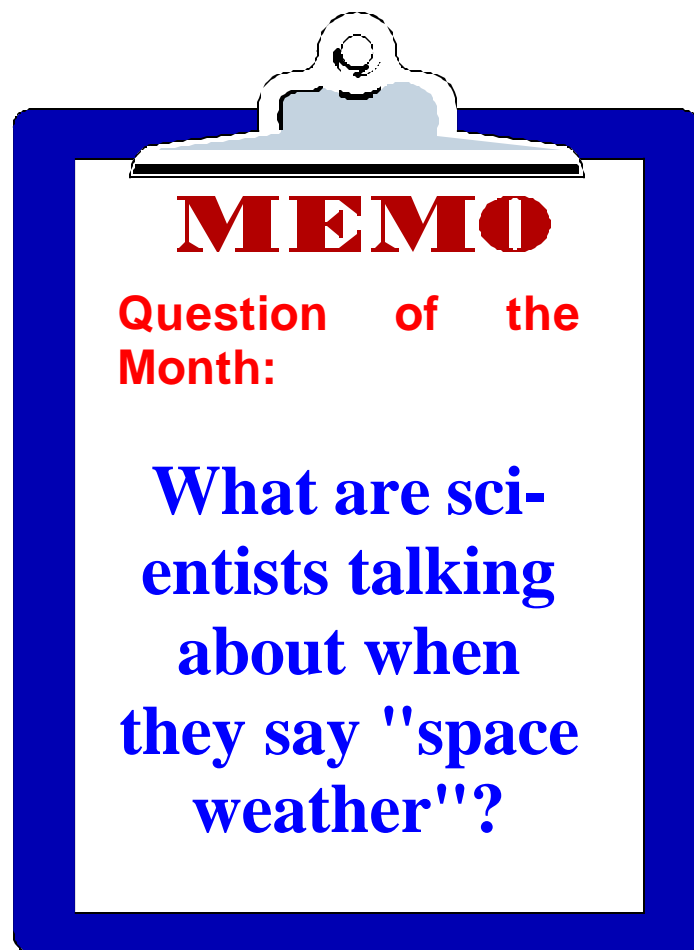
The author of individual articles bears all responsibility for publishing any e-mail addresses in the article on the World Wide Web



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Astronomy and Kids

This is the section strictly for kids (or kids at heart). We will be including information, stories, ideas, puzzles or anything that has to do with astronomy. The only difference here is, it will be directed for children. We don't discourage parents or any other adult to get involved. In fact, we encourage it strongly. So we hope you enjoy this section and if it touches a child's interest in astronomy, our



WORD SEARCH SOLUTION

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(Over,Down,Direction)
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 BETELGEUSE(7,8,SE)
 CANESVENATICI(13,15,SW)
 CASSIOPEIA(1,13,E)
 DELTASCUTI(13,10,NE)
 DENEbola(28,26,W)
 DUMBBELL(12,14,NW)
 MAGNETISM(20,4,S)
 MESSIER(13,9,E)
 OCCULTATION(23,26,NW)
 POLES(12,11,SE)
 SEYFERTGALAXY(1,1,SE)
 SOMBRERO(13,8,N)
 SUNSPOT(21,7,NE)
 URSAMAJOR(27,6,SW)
 VIRGO(19,17,S)
 VIRGOCLUSTER(16,26,W)

COLOR US!



ANSWER TO LAST MONTH'S "QUESTION OF THE MONTH"

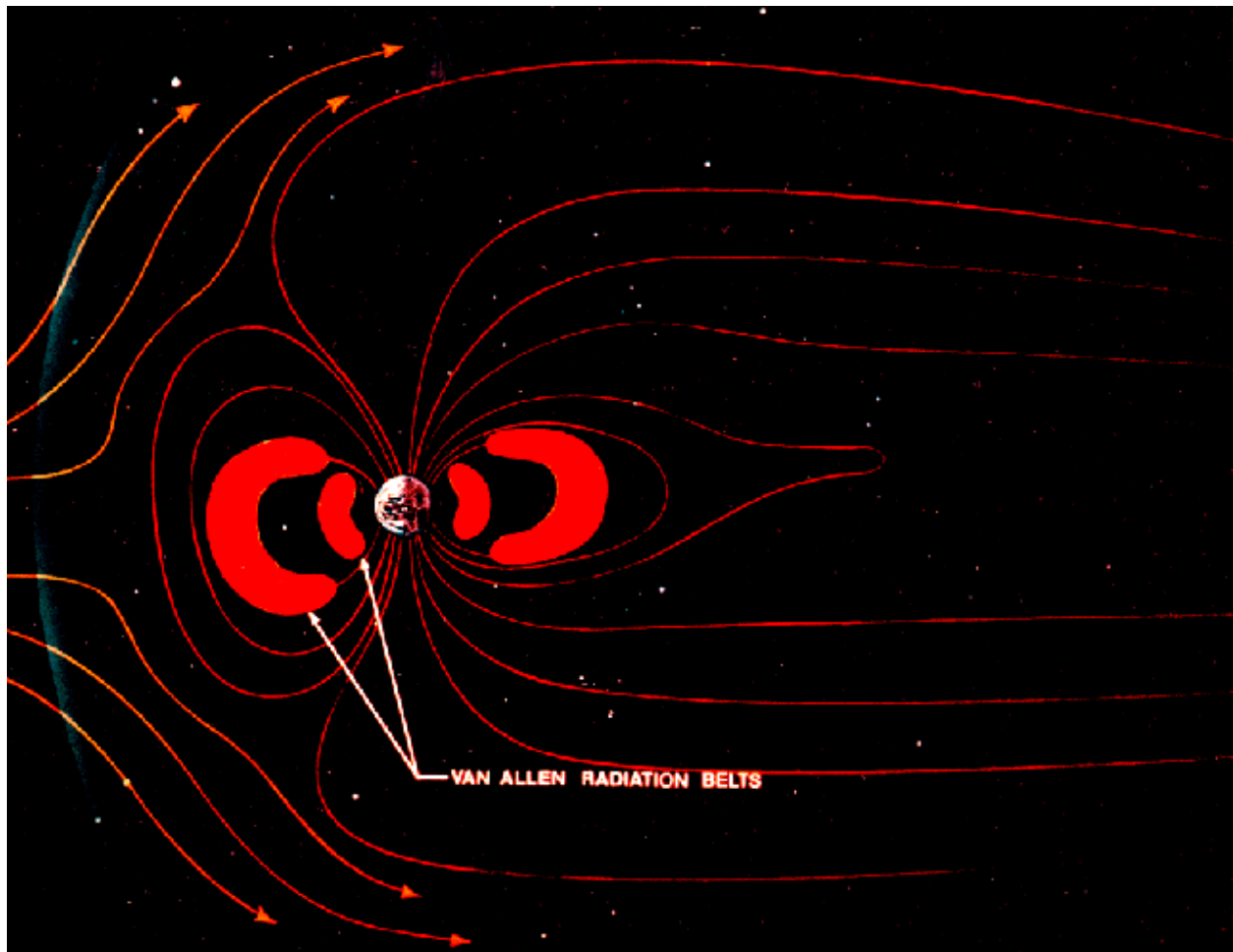
What are the Van Allen Belts?

Radiation Belts and Trapped Particles

Invisible clouds of particles orbit Earth. Scientists study them to protect our astronauts and our expensive satellite resources in space. <http://radbelts.gsfc.nasa.gov/outreach/outreach.html>

The Earth's Van Allen Belts consists of highly energetic ionized particles trapped in the Earth's geomagnetic fields. On the sunward side of the Earth, the geomagnetic fields are compressed by the Solar Wind while on the opposite side of the Earth, the geomagnetic fields extend to three Earth Radii. As a result, the geomagnetic field form an elongated cavity, known as the Chapman-Ferraro Cavity, around the Earth. Within this cavity, reside the Van Allen Radiation Belts. These radiation belts are composed of electrons with thousand eV energies, and protons with million eV energies.

The particles in the belts are not directly injected by the Solar Wind. Magnetic fields of a magnitude of 0.3 gauss prevent the Solar Wind from directly entering the radiation belts. Most of the particles result from neutron Albedo. Neutron Albedo is the process where Solar Flare particles interact



Courtesy of http://lasp.colorado.edu/strv/vanallen_strv.html

The Answer

David Stern, a researcher in another lab here at Goddard, has graciously supplied an answer to your question, given below:

"The radiation belts are regions of high-energy particles, mainly protons and electrons, held captive by the magnetic influence of the Earth. They have two main sources. A small but very intense "inner belt" (some call it "The Van Allen Belt" because it was discovered in 1958 by James Van Allen of the University of Iowa) is trapped within 4000 miles or so of the Earth's surface. It consists mainly a high-energy protons (10-50 MeV) and is a by-product of the cosmic radiation, a thin drizzle of very fast protons and nuclei which apparently fill all our galaxy.

" In addition there exist electrons and protons (and also oxygen particles from the upper atmosphere) given moderate energies (say 1-100 keV; 1 MeV = 1000 keV) by processes inside the domain of the Earth's magnetic field. Some of these electrons produce the polar aurora ("northern lights") when they hit the upper atmosphere, but many get trapped, and among those, protons and positive particles have most of the energy .

"I looked up a typical satellite passing the radiation belts (elliptic orbit, 200 miles to 20000 miles) and the radiation dosage per year is about 2500 rem, assuming one is shielded by 1 gr/cm-square of aluminum (about 1/8" thick plate) almost all of it while passing the inner belt. But there is no danger. The way the particles move in the magnetic field prevents them from hitting the atmosphere, and even if they are scattered so their orbit does intersect the ground, the atmosphere absorbs them long before they get very far. Even the space station would be safe, because the orbits usually stop above it--any particles dipping deeper down are lost much faster than they can be replenished.

"If all this sounds too technical but you still want to find out-- what ions and magnetic fields and cosmic rays are, etc.--you will find a long detailed exposition (both without math) on the World Wide Web at: <http://www.phy6.org/Education/Intro.html>

Courtesy of David Stern a researcher Goddard

Note:

Another point of particular interest to us in high-energy astrophysics is the South Atlantic Anomaly. This is a region of very high particle flux about 250 km above the Atlantic Ocean off the coast of Brazil and is a result of the fact that the Earth's rotational and magnetic axes are not aligned (see <http://www.oulu.fi/~spaceweb/textbook/radbelts.html>). The particle flux is so high in this region that often the detectors on our satellites must be shut off (or at least placed in a "safe" mode) to protect them from the radiation.

Courtesy of Andy Ptak with Ask an Astrophysicist (http://imagine.gsfc.nasa.gov/docs/ask_astro/answers/970228a.html)

WORD SEARCH

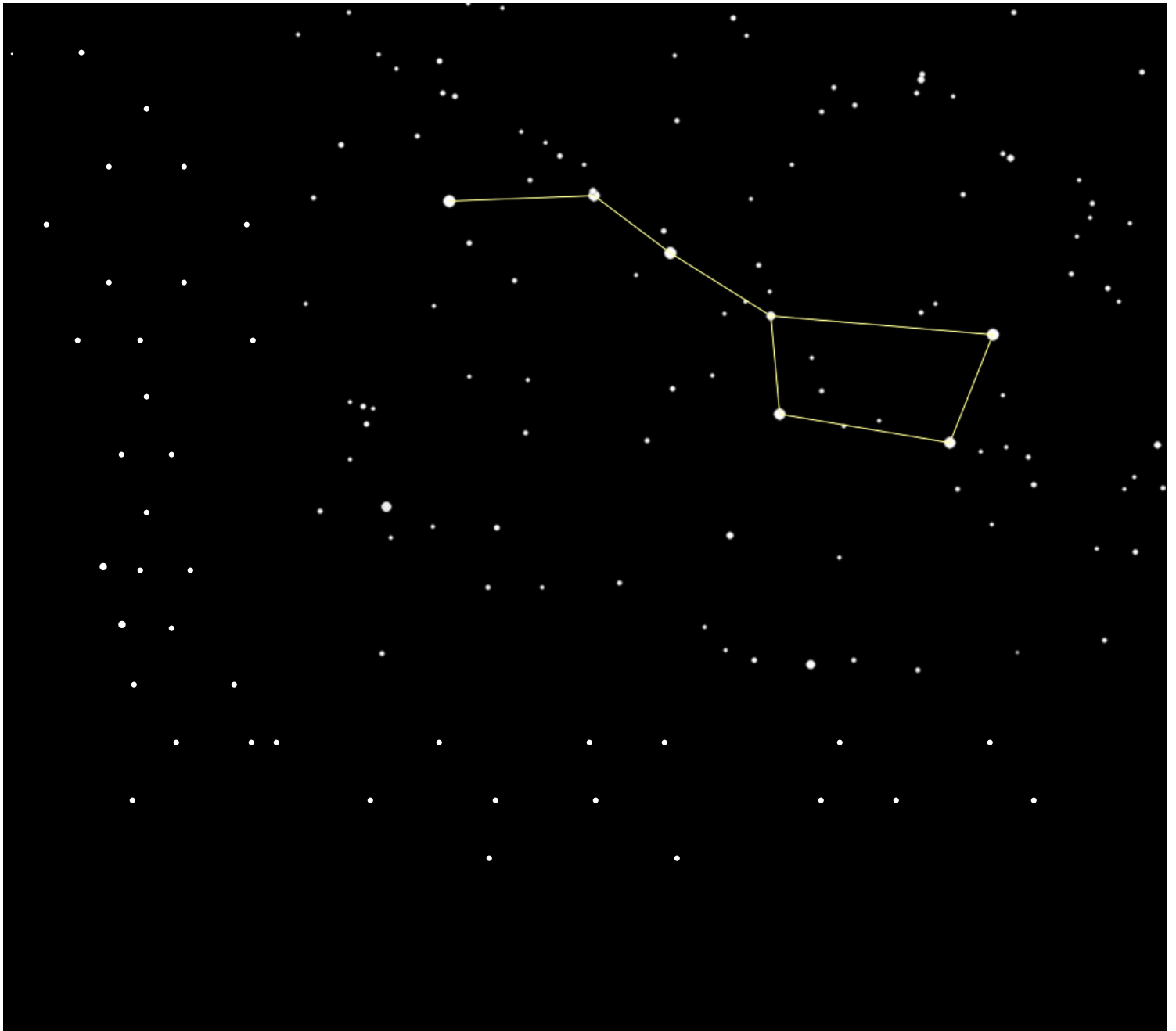
Space Weather

F F M A T A V S P C A F A E A Q Q W J O O P D Q L T M E N G
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F H D O Y V K O B Q W T Z R O A M G L C P M J C C B Y P L V
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T C N O B O M U F S F C X Y R Y M W A G I R U M M Y S O C G
M W D Y U R P A J A P E Y L C N R G O W L I E D A D Q T K A
J M Q X L S E L C Y C L I G F X Z A N F U E V H L Y Z O O L
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T X C A M I F X R L R Y U O P A K M A W W O J V H D G I Q D
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Y S E X U S A D T P S T Y E V C C F O N C N V J T L W D H R

Magnetosphere
Radiation
Magnetic fields
Solar flares
Coronal Mass Ejections
Cycles

Climate
Active region
Satellites
Xray
Ultraviolet
Solarwind

Geomagnetic
Blackouts
Ionospheric
Geostationary orbit
Atmospheric drag
photosphere



*Snoopy says, never stop looking
up..reach for the stars and may you al-
ways have clear skies!!!!*

