

D I S T A N T L I G H T

Rockland Astronomy Club Journal ~ March 2004



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SAVE THE DATE!
PLANETARY ALIGNMENT
SPECTACULAR MARCH 27TH
[CLICK HERE FOR MORE DETAILS](#)



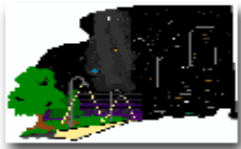
DISTANT LIGHT

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(requires Adobe Acrobat): send an email to Memberships@RocklandAstronomy.com

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International Dark Sky Association



Rockland Astronomy Club is proud to be the first astronomy club to become a lifetime member of the International Dark Sky Association, and is a longtime member of the Astronomical League.

[CLICK HERE TO GO TO APRIL SKYDATA: P. 7](#)

[CLICK HERE FOR RAC MEETINGS SCHEDULE AND ADVISORY COMMITTEE: P. 8](#)

RAC SPECIAL EVENT

A Planetary Alignment Spectacular!

Saturday March 27, 7 - 11 pm

Rockland Community College Fieldhouse Lawn

Don't miss this special opportunity to see Mercury, Venus, the first quarter Moon, Mars, Jupiter, and Saturn simultaneously. Come by at sunset to get a rare (and brief) opportunity to see Mercury at greatest elongation from the Sun. (Mercury is usually too close to the Sun's glare to view clearly).

LOCATION: Rockland Community College's lawn South of the Fieldhouse

Saturday March. 27, 2004, sunset to 11pm.

For directions to the exact location, or last minute weather cancellations, please call our hotline @ 201-768-2238.

We will also be sending out an Email postcard with more details shortly before the event. ★

RAC MEMBERSHIP APPLICATION

NOTE: Sky & Telescope subscription rates will increase to \$33.00 effective for expiration dates falling in the year 2004.

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City/State/Zip _____
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Type of Membership	Distant Light PDF via email (no print version available).
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NEWS FOCUS

New Hubble Images Show Deepest View of Universe

By Dennis Overbye
March 9, 2004

Like Moses being led to the mountain to see the Promised Land he would never visit, the Hubble Space Telescope has now seen to within “a stone’s throw” of the Big Bang itself, astronomers said today.

In a ceremony here that was part science workshop, part political rally and part starting gun for an astronomical gold rush, astronomers at the Space Telescope Science Institute on the Johns Hopkins University campus unveiled what they said was the deepest telescopic view into the universe that humankind had ever obtained.

Among the roughly 10,000 new galaxies revealed by a million-second exposure of a small patch of dark sky in the constellation Fornax are several dozen faint reddish spots that could be infant galaxies just emerging from the “dark ages” that prevailed in the first half-billion years after the Big Bang, when stars had not yet had time to form, the astronomers said.

“We might have seen the end of the beginning,” said Dr. Anton Koekenoe of the institute. He and others cautioned, however, that more work would be required before astronomers know if their surmises are correct.

Today’s look at the universe will not be superseded until the James Webb Space Telescope goes into orbit in 2011. When the new image, known officially as the Hubble Ultra Deep Field, has been analyzed, said Dr. Steven Beckwith, the director of the Space Telescope Science Institute, “we expect it to reveal new secrets to the origin of stars and galaxies, and ultimately ourselves.”



NASA

The image required 800 exposures taken over the course of 400 Hubble orbits around Earth.

The first bits of that work began with a frenzy today, when the institute simultaneously unveiled the images and made the raw data available to the entire world at hubblesite.org.

Before today, Dr. Beckwith said, only four people had seen the image and they had pledged among themselves not to work on it ahead of time, so as not to give the “home team” an advantage. “I wanted it to be like the great land rush where the gun is fired and everybody takes off,” Dr. Beckwith said.

The occasion also served as a reminder of the plight of the Hubble telescope, which is operating under a controversial death sentence. Since 1990, it has floated above the Earth’s murky atmosphere, providing astronomers with peerless views of the heavens, with the help of periodic refurbishments by astronauts.

But on Jan. 17, just a day after the Hubble had completed its marathon squint, NASA’s administrator, Sean O’Keefe, said any space shuttle missions to the telescope would be too unsafe and canceled them, dooming the Hubble to die a lingering death in orbit within three years. The decision set off an

outcry among scientists, the public and on Capitol Hill. In response to a protest by Sen. Barbara Milulski, Democrat of Maryland, the home of the space telescope, Mr. O’Keefe agreed to get a “second opinion” from Adm. Harold W. Gehman Jr., who was chairman of an investigation into the loss of the shuttle Columbia last year. His response is expected soon.

Last week, Representative Mark Udall, Democrat of Colorado, and seven colleagues introduced a resolution in the House Science Committee calling on NASA to establish an independent panel to study the question.

The astronomers denied that today’s event was timed to capitalize on the uproar over Hubble, but Senator Mikulski walked in unannounced to the telescope institute today, garnering applause, and then helped pull the curtain to unveil the new picture. She said in a short speech that she would not stop her efforts to save the Hubble after Admiral Gehman’s opinion was delivered.

“The future of the Hubble,” she said, “should not be decided by one man in a NASA back room without a transparent process.” ★

CONSTELLATION

Cancer (The Crab)

Edited by
Bernard Sokolowski

In the late winter and early spring, Cancer the crab will be very close to the meridian at around eleven PM. Cancer is an obscure and rather dim constellation lying east of Gemini and west of the head of Leo, where it fills in a rather devoid region of night sky that is more apparent under moderate light pollution. Five stars mark the outline of the crab, all of which are quite dim. The brightest barely shining at magnitude 4. As a group the stars take the form of an inverted Y, which requires quite a bit of imagination to visualize it as the shape of a Crab. Because it is so dim, Cancer can easily be overlooked or forgotten when there are so many brighter more easily found constellations in the surrounding regions that contain many more objects to observe. But because there are two very interesting showcase objects, and a couple of very attractive double stars to observe within its boundaries, it should always be included on any early spring observing list.

The constellation, like so many others, has a mythological origin. As legend has it, Cancer joined the dreaded Hydra in battle against Hercules. It was only a bit part, but one which secured its immortality. The swamps of Lerna was home of the dreaded Hydra, an enormous water snake with nine heads (one of which was immortal), and with breath that would kill on contact. With the help of Athene, Hercules located the monster's lair, and the ensuing struggle was a standoff. When one head was sliced off, another appeared in its place. Then at Hydra's plea, a giant crab emerged from the swamp and bit into Hercules' foot. Hercules promptly killed the animal and then cut off the Hydra's immortal head, killing it as well. He then dipped his

arrows in Hydra's blood. The slightest scratch from one of these arrows would bring instant death to his enemies. Some scholars believe that astrologers later added the crab to the myth in order to have the Twelve Labors of Hercules reflect the Twelve Signs of the Zodiac. While it is difficult to associate all of Hercules' labors with the zodiac, it is true that the crab figured in Hercules' Second Labor, and is in fact the Second Sign of the Zodiac. In any case, for following its master's command and sacrificing its life, the crab was awarded with a heavenly home. But, because Cancer failed to defeat Hercules, the gods did not give Cancer bright stars to mark the constellation.

Zeta Cancri is a magnitude 5.2 multiple star of spectral type F8 and G0. It lies at an actual distance of about 70 light years, and is one of the most interesting of all multiple star systems. Zeta was first discovered to be a double star in 1756 by T. Mayer. A third component was discovered by Sir William Herschel in 1781, and later on was found to have a fourth component as well. The B star has a magnitude of 6.0 and lays 0.6 arcseconds

distant from the magnitude 5.6 primary. Its period of revolution is 59.6 years. The C component is further still at 6.0 arcseconds distant, shining at magnitude 6.2 with a revolutionary period of 1150 years. All three components are usually described as yellow in color. Interesting to note is that star C has an unseen companion which is now believed to be a white dwarf. The A and C stars are easy to separate in almost any size telescope. The A-B separation is considerably more difficult and requires a scope of 8 or more inches and really steady skies to split into completely separate components.

Iota Cancri is a magnitude 4.1 magnitude double star of spectral class G8 and A3 respectively. The apparent separation of the pair is 30 arcseconds. The A star shines at magnitude 4.2 and the B at 6.6. Both components are Yellow and Blue in color, very much resembling a dimmer Albireo (Beta Cygni) in Cygnus. This is a showpiece type double star and can be split in any size scope as well as most high power binoculars.

Continued on next page



CONSTELLATION OF THE MONTH

(continued from previous page)

M44 (NGC 2632) is a Magnitude 3.1 open cluster with an angular diameter of 95 arcminutes, an actual distance of 525 light years, and actual total diameter of 40 light years. Commonly known as the Beehive, and also as Praesepe, it is one of the largest, brightest, nearest, and most pronounced of all open clusters. According to legend, Praesepe was used to forecast the weather. Its invisibility in a clear night sky meant that a violent storm was on the way. Previous to 130BC, the beehive had been referred to as “little mist” and “little cloud”. The actual nature of the object did not become apparent till 1610 with the invention of the telescope. Galileo was the

first to observe the Beehive with the new instrument, discovering that it was made up of many glittering suns.

The bright central region of M44 is about 13 light years, with outer members increasing the size to 40 light years. Up to 350 stars have been counted for the group, but only 200 or so are believed to be actual members. 80 of the members are brighter than magnitude 10. Most of the 200 are main sequence stars, and range in spectral type from A2 to K6. The motion of M44 appears to be very nearly equal and parallel to The Hyades in Taurus. Both clusters seem to be identical in age, and it has been postulated that both clusters have a common origin.

Finding M44 is not difficult, it can easily be seen with the naked eye, or found just

2 degrees north and half degree west of Delta Cancr. The Beehive can be observed in almost any size optical instrument. Small rich field scopes and medium sized binoculars frame the cluster best.

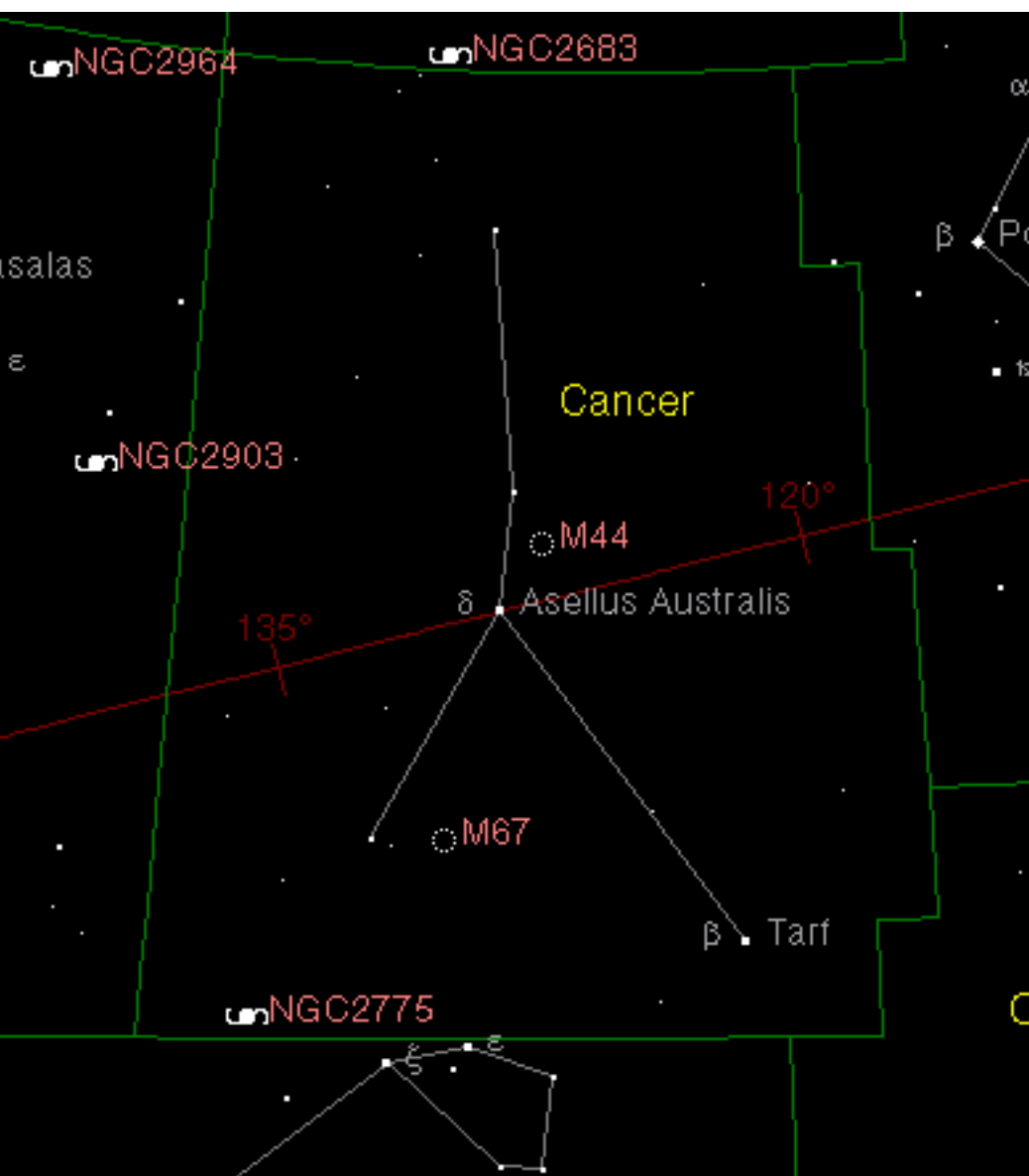
M67 (NGC 2682) is a magnitude 6.9 open cluster with an angular diameter of 30 arcminutes an actual distance of 2500 light years, and a true diameter of 12 light years. It is a rather compact group with an estimated total of 500 stars as members. The member stars range in magnitude from 10 to 16 and in spectral type from B9 (Blue) to K4 (Orange). The cluster is easily found just 1.5 degrees west of Alpha Cancr. When observing the cluster, one can see the wide variety of star colors from Blue-white to Orange, and makes M67 one of the more attractive ones to observe. M67 is unusual in two respects. One is that it lies 1500 light year above the galactic plane, where as most Open clusters lie within the galactic plane. Second being that M67 is one of the oldest (10 billion years) of all open clusters known. Only NGC 188 in Cepheus is older. This puts M67 very close to the same age as globular clusters.

Most globular clusters are devoid of heavier elements, especially metals. M67 contains them in greater abundance and the percentages are very similar to our own sun.

You can observe this cluster with nearly any telescope. A 6 or 8-inch scope at low power seems to frame the cluster best. When observing this cluster, try looking for the differing color contrasts between the individual stars.

There are very few observable galaxies in Cancer, and most are so dim that they are not within the reach of most commonly owned telescopes. However the following object may be of interest for those with larger (8” or over) scopes.

NGC 2775 is magnitude 10.1 Sa spiral galaxy with an apparent diameter of 4.3 x 3.3 arcminutes. It is best observed in an 8” or larger scope from a dark sky. The appearance is best described as: a bright core with a dim halo. ★



SPACE GALLERY

Space Phenomenon Imitates Art in Universe's Version of van Gogh Painting

"Starry Night," Vincent van Gogh's famous painting, is renowned for its bold whorls of light sweeping across a raging night sky. Although this image of the heavens came only from the artist's restless imagination, a new picture from NASA's Hubble Space Telescope bears remarkable similarities to the van Gogh work, complete with never-before-seen spirals of dust swirling across trillions of miles of interstellar space.

This image, obtained with the Advanced Camera for Surveys on February 8, 2004, is Hubble's latest view of an expanding halo of light around a distant star, named V838 Monocerotis (V838 Mon). The illumination of interstellar dust comes

from the red supergiant star at the middle of the image, which gave off a flashbulb-like pulse of light two years ago. V838 Mon is located about 20,000 light-years away from Earth in the direction of the constellation Monoceros, placing the star at the outer edge of our Milky Way galaxy.

Called a light echo, the expanding illumination of a dusty cloud around the star has been revealing remarkable structures ever since the star suddenly brightened for several weeks in early 2002. Though Hubble has followed the light echo in several snapshots, this new image shows swirls or eddies in the dusty cloud for the first time. These eddies are probably caused by turbulence in the dust and gas around the star as they slowly expand away. The dust and gas



were likely ejected from the star in a previous explosion, similar to the 2002 event, which occurred some tens of thousands of years ago. The surrounding dust remained invisible and unsuspected until suddenly illuminated by the brilliant explosion of the central star two years ago.

The Hubble telescope has imaged V838 Mon and its light echo several times since the star's outburst in January 2002, in order to follow the constantly changing appearance of the dust as the pulse of illumination continues to expand away from the star at the speed of light. During the outburst event, the normally faint star suddenly brightened, becoming 600,000 times more luminous than our Sun. It was thus one of the brightest stars in the

entire Milky Way, until it faded away again in April 2002. The star has some similarities to a class of objects called "novae," which suddenly increase in brightness due to thermonuclear explosions at their surfaces; however, the detailed behavior of V838 Mon, in particular its extremely red color, has been completely different from any previously known nova.

Nature's own piece of performance art, this structure will continue to change its appearance in coming years as the light from the stellar outburst continues to propagate outward and bounce off more distant black clouds of dust. Astronomers expect the echoes to remain visible for at least the rest of the current decade. ★

NASA and The Hubble Heritage Team (AURA/STScI)

MARCH'S HOT LINK

Superb Free Lunar Atlas

Alan Chu (Hong Kong contingent) has released a superb lunar atlas which may be downloaded/accessed as a web-based version, CD version, or PDF printable book form (my own choice is the book format)!

Available here at no charge, courtesy of Alan:

<http://moonbook.hkas.org.hk>

Check it out... you will not be disappointed, trust me! — Paul Hyndman



Full
Mar 6

Last Qtr
Mar 20

New
Mar 20

1st Qtr
Mar 28

MARCH SKYDATA

Highlights

- Mar 1 05:00 Saturn is 4.5 deg south of the Moon.
- Mar 4 12:00 Jupiter is at opposition.
- Mar 6 Jupiter will be approx 3 deg south of the full Moon.
- Mar 20 01:50 Spring Equinox.
- Mar 22 03:00 Maximum of March Geminids meteor shower (30 per hour).
- Mar 24 16:00 Venus is 2.2 north deg of the Moon.
- Mar 25 20:10 Mars will be .25 deg south of the Moon.
- Mar 27 20:00 **Alignment of Venus, Mars, Moon Jupiter and Saturn.**
- Mar 28 03:00 Triple shadow transit on Jupiter.

16 minutes when the day and night should be perfectly equal?

The cause of the mystery comes from the Earth's atmosphere. The spherical layer of air deforms images causing an effect known as refraction. The bigger the layer of air, the bigger the refraction is. When the Sun is on the horizon, either at sunset or sunrise, its low light cuts through the thickest cross section of air and its image is pulled up, or refracted, by 0.5 deg.

This corresponds to the maximum refraction of the Sun. Each day it moves back by 1 deg, to go around the sky in a year (360deg). Between rising and setting it recedes by 0.5 deg angular distance, which it covers in two minutes. The length of time that it stays visible is therefore increased by two minutes.

THE SPRING EQUINOX MYSTERY

The word "Equinox" comes from the Latin aequinoctium and means that day and night are of equal length. However we can see that this is not true. The Spring equinox takes place on the 20th at 1:50am. On that day the Sun rises at 6:23am and sets at 6:31 pm. The length of time when the Sun is up is 12 hours and 8 minutes, and the night lasts for 11 hours and 52 minutes. Why is there this discrepancy of

In total, refraction is responsible for increasing the presents of the Sun above the horizon by four minutes and its daily movement by two minutes making six extra minutes. Another two minutes are added because this year equinox takes place at 1:50am and not 12noon. This is why day and night are not perfectly equal even at the exact moment of the equinox. Mystery solved! ★

Prime Observing Window

Saturday Mar 13 thru Tuesday Mar 23

Sun & Moon Rise & Set Times

Date	Sunrise	Set	Moonrise	Set	Phase
Mar 6	06:45	18:16	18:08	20:34	Full
Mar 13	06:34	18:23	01:21	02:45	Last Qtr
Mar 20	06:23	18:31	06:31	05:44	New
Mar 28	06:10	18:39	06:39	00:24	1st Qtr

Planetary

Visible Planets in the Night Sky

March 1, 2004

	Const	Rise	Transit	Set	Mag
Sun		06:48	12:32	18:16	-28.6
Mercury	Aqr	06:54	12:27	18:02	-1.6
Venus	Psc	08:30	15:13	21:57	-4.2
Mars	Ari	09:28	16:39	23:48	1.1
Jupiter	Leo	18:12	00:42	07:13	-2.5
Saturn	Gem	12:39	20:07	03:34	2.2

March 15

	Const	Rise	Transit	Set	Mag
Sun		06:26	12:29	18:30	-28.6
Mercury	Psc	06:55	13:09	19:25	1.3
Venus	Ari	08:09	15:16	22:23	-4.3
Mars	Tau	09:00	16:20	23:39	-1.3
Jupiter	Leo	17:08	23:41	06:13	-2.5
Saturn	Gem	11:40	19:12	02:39	2.3

March 30

	Const	Rise	Transit	Set	Mag
Sun		06:00	12:24	18:46	-28.6
Mercury	Ari	06:32	13:29	20:23	0.4
Venus	Tau	07:49	15:19	22:48	-4.4
Mars	Tau	08:32	16:00	23:28	1.4
Jupiter	Leo	15:56	22:31	05:06	-2.4
Saturn	Gem	10:40	18:11	01:38	2.4



The RAC Essentials

MARCH CALENDAR

- 201-768-2238** **Message Hotline: The latest information or last minute changes to club events.**
- Tuesday, March 9 Advisory Committee Meeting
- Sat March 13, 7pm** **RAC Annual Dinner**
- Saturday, March 27 7-11pm** **Planetary Alignment Viewing Lawn near RCC Fieldhouse (see page 2 for more details)**
- Prime Observing Period March 13 through 23

KEY PERSONNEL

Contact any person on this list for advice on a specific topic:

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- Senior Advisor**
 Al Nagler

LOCATIONS

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- | | |
|---|---|
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Hammond Road, Thiells, NY | Jose Alvira
Frank Bifulco |
| Rockland Community College
College Road, Suffern, NY | Jim Burnell
Mark Hettinger |
| Lower Hudson Valley Challenger Center
Rt. 59, Suffern, NY | Mies Hora
Rob Lyons |
| Anthony Wayne Recreation Area*
Exit 17, P.I.P., NY | Keith Murdock
Al Nagler |
| Silvermine Ski Area*
Exit 18, P.I.P., NY | Dr. Jack Rosen
Audry Salvatore |
| Wawayanda State Park*
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Highland Lakes, NJ | Len Salvatore
Ed Siemenn, <i>Chair</i> |
| Tahganic State Park*
Taconic State Parkway,
Ancram, NY | Bill Thys
Alan Traino
Don Urban |

- Life & Honorary Members**
 Robin Brennan (H)
 Tom Massey (L)
 Al Nagler (L)
 Andrew Warrington (H)

*Special permits required to observe at these locations. Contact Don Urban for permit copies.