



The Sombrero Galaxy from HST
Credit: Hubble Heritage Team (AURA/STScI/NASA)

★ April 2004 Volume # 3 Issue # 4 ★
★ **STARS & SCOPES** ★
★

The Newsletter of the Rocky Mountain Astronomy Club (RMAC)
Web site : www.rmastronomy.org
Editor not responsible for errors, misprints, etc.

RMAC Officers for 2004
Phil Brown.....President
Ph # 564-2765
e-mail: pdndbrown@msn.com
Bill Brown.....Vice-President
Ph # 549-2683 or 583-0354
e-mail:
william.brown@colostate-pueblo.edu
u
Walt Russell.....Treasurer
Ph # 263-54583
e-mail: wdrussell1@juno.com
Bob Adams.....Secretary
Ph # N/A
e-mail: bovi9@aol.com
Mike Verry....Member-at-Large

Picture top left courtesy of : <http://antwrp.gsfc.nasa.gov/apod/archivepic.html>
Picture top left :The Sombrero Galaxy from HST
Credit : Hubble Heritage Team, (AURA / STScI / NASA)

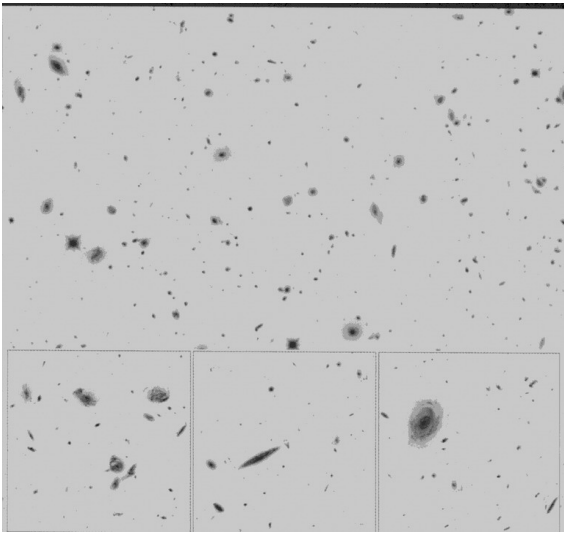
Welcome and greetings from the RMAC Board & Editor.
--- NOTICE ---
Regular RMAC Meetings meet in room # 242.

Science News, vol. 165, #11, 03/13/2004 issue, p164, article title "**Deepest Vision Yet, Hubble takes ultralong look at the cosmos.**" by R. Cowen

On March 9th astronomers unveiled the deepest visible-light portrait of the universe ever made. Compiled by the Hubble Space Telescope as it stared into a narrow corridor of space more than 13 billion light-years long, the mosaic of images also includes infrared pictures of what appear to be the most distant objects detected so far. The images were released as astronomers and members of Congress objected to NASA plans to cancel a shuttle mission to repair and upgrade the telescope.

Dubbed the Hubble Ultra Deep Field (UDF), the images feature a panoply of galaxy shapes, from the classic spirals and ellipticals common in the cosmos today to a zoo of misshapen oddballs that may be among the first galaxies to have coalesced. Located in a region of the Fornax cluster examined by a slew of other telescopes, UDF "takes us to within a stone's throw of the Big Bang itself," says Massimo Stiavelli of the Space Telescope Science Institute in Baltimore.

With 11.3 days of observing time spread over 4 months, UDF can depict objects as faint as the glow of a firefly on the moon. It reveals galaxies only one-fourth as bright as the faintest recorded by Hubble's previous deep-field studies.



Visible light & near-infrared portrait of galaxies.
Insets: Close-ups of a range of galaxy types.
Photo courtesy of Science News Vol. 165, #11, 03/13/04, p164 (Negative image by editor.)

Upcoming RMAC Events
Club Star Watch
April 17th, Graneros Gorge
May 22nd, June 19th,
July 17th, Aug. 14th,
Sept. 18th, Oct. 16th,
Nov. 13th, Dec. 11th
To be determined.
Public Star Watch
April 10th, May 15th,
June 12th, July 10th,
Aug. 07th, Sept. 11th,
Oct. 09th, Nov. 06th,
Dec. 11th
At the Raptor Center & CSUP Observatory.

The telescope's Advanced Camera for Surveys contributed the visible-light portion of UDF, which spans a sky region equivalent to one-hundredth the apparent area Continued on Page 2.

CSUP Observatory Open House

Open house will continue on Tuesdays nights.
About 1 hour after sunset.
Directions: Take Pueblo Blvd. to 11th street. Turn west on to 11th street. About 0.6 mile & at the top of the hill turn left into the Raptor Center Parking lot.
At the end there is a trail leading up to the Observatory. Please take a flashlight with you.
The observatory is run by volunteers & they may not be there always on time. Please be patient. The Observatory will not open during high winds (over 20 mph), rain, overcast, & snow.

Celestial Events

April 24, 2004
Astronomy Day Worldwide

June 08, 2004
Watch for a transit of Venus, observers in N. America will only be able to view the end of the event at sunrise.

October 28, 2004
Total Lunar Eclipse, this event will have good

Regional Star Parties

May 16-23, 2004
Texas Star Party, near Ft. Davis, TX. For more information go to:
www.texasstarparty.org

June 12-19, 2004
Grand Canyon Star Party, at Yavapai Point. For more information go to:
www.tusconastronomy.org/gcsp.html

“Deepest Vision Yet, Hubble takes ultralong look at the cosmos.”

Continued from page 1.

of the full moon. Hubble's recently revived Near Infrared Camera and Multi-Object Spectrograph covered about half that area for UDF. That camera detects the most-remote galaxies because cosmic expansion shifts the light emitted by distant galaxies into the near-infrared part of the spectrum.

Science News, vol. 165, #08, 02/21/2004 issue, p126, article title “Finding the star that was.” by R. Cowen

By sifting through archival images, astronomers have identified the star whose explosive demise was recorded by telescopes last year. It's the third time scientists have observed what a particular star looked like before it was blown to smithereens and the first time that they've uncovered the origin of the most common type of supernova. The discovery confirms the accepted theory that type II supernovas are produced when elderly, bloated stars known as red supergiants run out of nuclear fuel and collapse.

The researchers began their search for archived images of the star last June, after an amateur astronomer, using a backyard telescope, found a supernova in the galaxy M74, about 30 million light-years from Earth. As luck would have it, both the Hubble Space Telescope and the Gemini North Telescope on Hawaii's Mauna Kea had imaged the original star less than a year before the supernova find. The images reveal that the red supergiant star was about 8 times as massive as the sun, which is near the low end of what theory predicts for the mass of stars that can flame out in a supernova.

Science News, vol. 165, #12, 03/20/2004 issue, p188, article title “Revisiting a forgotten planet.” by R. Cowen

Engineers are readying a NASA spacecraft for a May 11 launch to one of the least-explored planets in the solar system. If all goes according to plan, the craft will begin orbiting Mercury, the sun's closest planet, in 2009 and take the first close-up images of the pockmarked body since 1975.

The craft, known as MESSENGER (for Mercury Surface, Space Environment, Geochemistry, and Ranging), will be the first to image the entire planet, a place of extremes. At any given moment, one side of Mercury is hot enough to melt zinc while the other is cold enough to freeze methane—a temperature range of 600°C.

During its mission, MESSENGER will search for signs of ice in permanently shaded craters and attempt to determine, by closely examining the orb's rotation, whether Mercury has a liquid core. To protect itself from the planet's intense heat, MESSENGER has a ceramic-fabric sun-shade and will pass only briefly over hot spots on the surface.

To reach its final destination, MESSENGER must get several gravitational boosts. They'll come from its three scheduled flybys of Venus, this November and in 2005 and 2006, and two of Mercury, in 2007 and 2008, before settling into its specific, year-long orbit around Mercury.

Article combination of articles from Astronomy & Science News.”A Pair of Pulsars”

A binary star system 2,000 light-years away, reported to contain a pulsar and a neutron star, actually has two pulsars, is the only known duo among the more than 1,400 pulsars found since 1967. The pulsars, designated PSR J0737—3039A and B, have a 2.4-hour orbit nearly edge-on to Earth. This means the B pulsar eclipses A periodically.

Andrew G. Lyne of the University of Manchester in England and his colleagues report the find in an upcoming Science.

The researchers had originally thought that the pair consists of a single pulsar spinning 44 times a second around a neutron star that isn't sending out radio pulses.

Continued on Page 3.

Stars and Scopes
1580 N. Cheshire Dr.
Pueblo West CO 81007

Editor
Michael Verry
Ph # 719-547-7957
e-mail
rmacboardmem5@juno.com

**Binocular & Small Telescope
Objects**

Winter
M 44, 67 in Cancer
M 48 in Hydra
M 40, 81, 82, 97, 101, 108,
109 in Ursa Major
M 65, 66, 95, 96, 105 in Leo
M 3, 51, 63, 94, 106 in Canes
Venatici

— Directions —

— RMAC Meetings —

Take Hwy. 47 to CSUP, Pueblo, CO.
In the technology building, room 244
at 6:00 pm for Board meetings and
7:00 pm for club meetings. The
technology building is next to the
radio station.

— Raptor Center —

Directions: Take Pueblo Blvd. to 11th
street. Turn west on to 11th street.
About 0.6 mile & at the top of the hill
turn left into the Raptor Center
Parking lot.

Please take a flashlight with you.

— So. Fishing Area —

From Pueblo Blvd., turn west on
Hwy. 96 (toward Wetmore) and travel
about 10.6 miles. Sign lake pueblo
state park on right Make a right turn.
Stay on the paved road for 1.6 miles
and take it till it ends.

— Graneros Gorge —

From Pueblo, take I25 south to exit
71 Graneros Road. (Next exit past
Colo. City.) Go over interstate &
make left (north) on the frontage
road. Pavement ends, make right over
cattle guard onto dirt (&bumpy) road
stay right, go 1 mile, road ends in a
cul-de-sac.

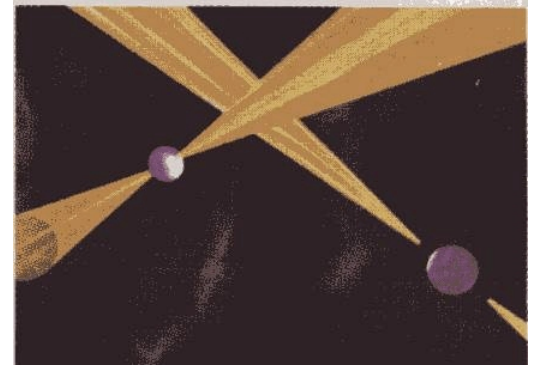
"A Pair of Pulsars"

Those initial findings were reported in 2002. Follow-up observations with radio telescopes in New South Wales, Australia, and at the University of Manchester revealed that the companion also pulses radio waves, but at a slower rate of once every 2.8 seconds. The interaction of these two ultradense bodies provides a unique opportunity to test the general theory of relativity, Lyne says.

stars that beam radiation. The more massive star in the pair evolved and went supernova, creating the A pulsar. As the B star became a red giant, the A pulsar began to pull gas from it. This sped up the A star's rotation. Finally, the B star also exploded, making a second pulsar.

The team expects to see orbital decay as the pulsars radiate gravity waves as relativity predicts; theory suggests they will spiral into each other about 85 million years from now.

Continued from page 2.



From a binary pair, to two pulsars. Each star exploded as a supernova. Picture courtesy of Science News Vol. 165, #10, 03/06/04, p156

By chance, the orbits of the partners lie nearly edge-on to Earth, so that one pulsar's signal periodically eclipses the other's. Moreover, the intensity of radio waves from the slower pulsar varies dramatically, almost petering out before returning to full strength. The variation is probably due to the blasts of radiation and the relentless wind of particles that this pulsar must with-stand as its elongated orbit takes it alter-natively nearer to and farther from its faster, brighter partner, the team suggests. The eclipsing and the signal variation offer astronomers the first opportunities to probe a pulsar's outer atmosphere. Study of the eclipses also shows that A's pulsar beam is blasting B's magnetosphere. This will give insights on pulsar beams and magnetospheres.

Science News, vol. 165, #12, 03/20/2004 issue, p188, article title "Wrenching Findings: Homing in on dark energy" by R. Cowen

Something is pulling the universe apart, causing galaxies to flee from each other at an ever-faster rate. Since 1998, when astronomers discovered this bewildering state of affairs, theorists have been struggling to comprehend the mysterious source driving the runaway expansion. Now, researchers have taken one of the first steps toward identifying this bizarre influence, often known as dark energy.

In an analysis of a group of bright but distant exploding stars called type 1A supernovas, researchers have found hints that dark energy is distributed uniformly throughout space and that its strength will remain constant throughout time. That would make dark energy resemble the cosmological constant,

Continued on Page 4.

Observing Request

If anyone is interested in trying some astrophotography or would just like to get out and do some viewing, please contact Klaus Priebe at 719-240-0020 or e-mail me at kpphoto7@hotmail.com . Thanks! Klaus

“Wrenching Findings: Homing in on dark energy”

Continued from page 3.

a term that Albert Einstein introduced into his general relativity theory in 1917. The cosmological constant refers to an unspecified property of space that could add to or oppose gravitational attraction.

Adam G. Riess of the Space Telescope Science Institute in Baltimore announced the new findings last week. In the study, Riess and his collaborators analyzed the brightness and colors of 16 type 1A supernovas, all of which the Hubble Space Telescope had discovered. The group includes six of the seven most distant supernovas known.

Because all type Ia supernovas have about the same intrinsic brightness, they serve as cosmic markers, enabling researchers to measure the size and expansion rate of the universe at different times in the past. From the expansion rate calculated from the new data, Riess' team suggests that the universe experiences a constant push. This finding is consistent with dark energy being the cosmological constant.

Because the cosmological constant would exist even in the absence of matter or radiation, dark energy might be an intrinsic property of space itself. Space on the subatomic scale isn't empty but seething with elementary particles that pop in and out of existence on extremely short time scales. Dark energy might result from the activity of some of these particles.

The fate of the universe hinges on whether the strength of dark energy varies over time. In the cosmological-constant scenario, the steady push provided by dark energy causes space-time to expand and the galaxies that lie within it to become ever more distant from one another, but they don't fall apart. In such a rarefied universe, a resident of the Milky Way billions of years from now would not see a single other galaxy in the sky.

In a competing theory known as quintessence, which Steinhardt and other theorists have proposed, dark energy is not a fundamental property of space. Instead, it's associated with some unidentified energy field that has variable strength. If this field grows stronger, it will not only expand space-time but also shred every galaxy, star, and even atoms, ending the universe in what's called the Big Rip. If the energy field weakens sufficiently, the gravitational tug of matter will eventually overwhelm it, and the universe will ultimately collapse, ending in a Big Crunch.

The new study of exploding stars doubles the precision of previous supernova-derived data on the character of dark energy. At the same time, both Steinhardt and Riess agree, the new data don't rule out most versions of quintessence.

RMAC Board Highlights

The March 2004, RMAC Board meeting did business as usual. The Board is looking at different options for possible Liability Ins coverage. This will protect the club if there is an accident at a RMAC Club function. The Board is looking at possibly joining a public outreach section of NASA. There was talk of possibly joining the Astronomical League and/or an associated Club/League, this option may give the club a better price on Liability Ins. As usual, the Public Star Watches will be at the Raptor Center Parking Lot and at the CSUP Observatory. Start time at least an hour after sunset. Viewing gets better after the twilight. The next Club Star Watch will be at Graneros Gorge on April 17th. The program for April 12, 2004 is Dan Lesniewski – "Black holes."

PLANET & OTHER OBJECT HIGHLIGHTS. *(Information from Astronomy Magazine)*

Venus will be bright in the sky at a mag of – 4.5 in the evening. Venus's phase shrinks from half lit to a crescent. Venus sets 4 hours after sunset and is 25° above the western horizon. Mars is fading away at a mag of 1.3. Jupiter shines at a mag of – 2.3, with good viewing all night. Saturn is at a mag of 0.1 and the Cassini Spacecraft will be arriving on 07/01/2004. Uranus and Neptune are lost in the sun's glare, since both are at solar conjunction. In May, Mars, Venus & saturn will line up in conjunction. The Lyre's meteor shower is this month, with the peak around midnight on April 21/22.

Around mid-month, Comet C/2002 T7 is visible at about 7° from the horizon. The comet is still near the 3rd mag. Gamma star in Pegasus and look to the right. The comet is forecasted to reach a brightness of 2 mag. Comet C/2001 Q4 will appear in the sky in May. Asteroid 1 Ceres has a mag. of 8.3 and travels between Castor & Pollux in Gemini.

A Call for Newsletter Submissions

If you would like to contribute an article, observing report, astro-photo, etc. to be published in the Stars and Scopes Newsletter, then submit them to Michael Verry, 1580 N. Cheshire Dr., Pueblo West CO 81007 or e-mail them to rmaceditor1@juno.com. When sending photos, please send them in JPG format and as large as possible. Please note that I can scan photographs, negatives and slides. I can return your photo/slide/negative at a RMAC meeting or event or contact me & we can work something out. If you would like to see something in the newsletter or would something changed, submit your request.