



© ESA/DLR/FU Berlin (G. Neukum)



March 2005



Volume # 4 Issue # 03



STARS & SCOPES



The Newsletter of the Rocky Mountain Astronomy Club (RMAC)

Web site : www.rmastronomy.info



Editor not responsible for errors, misprints, etc. Some photos, digital images, etc. may be changed or adjusted in order to fit in the Newsletter. The editor has no intention of causing any intended harm or malice by production of this newsletter.



RMAC Officers for 2004/2005

Bill Brown.....President

Ph # 549-2683 or 583-0354

e-mail:

william.brown@colostate-pueblo.edu

Klaus Priebe.....Vice-President

Ph # 545-3931 Cell # 240-0020

e-mail: kpphoto7@hotmail.com

Walt Russell.....Treasurer

Ph # 263-5483

e-mail: wdrussell1@juno.com

Doug Knight.....Secretary

Ph # 547-3214

e-mail: dknight5@mindspring.com

Mike Verry....Member-at-Large

Ph # 547-7957

e-mail:

rmaemikebrdmbr@yahoo.com

Upcoming RMAC Events

Club Star Watch

03/12 N. Fishing area #1, Directions at end of newsletter.

The following To be announced:

04/09 , 05/07 , 06/04 , 07/09 , 08/06 , 09/03 , 10/01 , 11/05 , 12/03

Public Star Watch

At the Raptor Center & CSUP Observatory.

03/05 , 04/02 , 05/14 , 06/11 , 07/16 , 08/13 , 09/10 , 10/08 , 11/12 , 12/10

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

Picture top left courtesy of : <http://antwrp.gsfc.nasa.gov/apod/archivepix.html>

Picture top left : Melas, Candor and Ophir : Valleys of Mariner

Credit & Copyright: G. Neukum (FU Berlin) et al , Mars Express, DLR, ESA

Welcome and greetings from the RMAC Board & Editor.

Regular RMAC Meetings start at 7 PM and meet in the **Physics/Math Building room #103**. RMAC meet every second Monday of the month.

The RMAC Annual Dues are due by the end of January. If you have not already paid the Annual dues, then please send your Dues to Walter Russell, 67136 Russell Rd., Boone, CO 81025 or bring them to the March 14th regular meeting.

Last December 2004, the RMAC Membership decided to merge with Southern Colorado Astronomical Society (SCAS.) According to the merger agreement, (RMAC membership voted & approved this), a name change for the new merged club is to be voted on. A simple majority is all that is required for the name change. Please pick a new name for the merged clubs, SCAS or Pueblo Astronomy Club ((PAC), by or at the 03/14/05 meeting.

Science News 02/05/05 Vol. 167 #6, article title "Detecting life on Mars" by Christen Brownlee

Despite ample evidence for liquid water on Mars, scientists remain unsure whether life ever resided there. Results from a 1976 Viking probe to the Red Planet failed to find any chemical sign of life, but many scientists argue that the probe wasn't sensitive enough to do so.

Alison M. Skelley and her colleagues have come up with a new way to search for Martian life. They started with an existing device, the Mars Organic Detector, that would remove trace amino acids—the building blocks of proteins—from Martian soil, if they are there. However, the mere presence of amino acids isn't a definite sign of life, but a key geometric trait of the molecules can be.

So, Skelley's team designed a complementary device, the Mars Organic Analyzer. It would take amino acid residues from the detector and then determine whether the molecules have a left-handed or right-handed configuration. Amino acids can exist in either form in nature. A lifeless setting would have about equal amounts of each, but in living organisms, amino acids invariably assume the left-handed form. Detecting a lopsided abundance of one or the other form of amino acids on Mars, therefore, could be a sign of life.

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

04/08/05 partial solar eclipse. 20% totality fo CO.

Lyrid shower April 21/22

Lunar Phases – 4th quarter

02/03/05, new 02/10/05, 1st quarter

02/17/05, full 02/25/05.

For a list of all Star Parties goto:

<http://skyandtelescope.com/resources/calender>

Regional Star Parties

International dark sky meeting,

04/06 to 04/08, Tucson AZ email

ida@darkskyorg or

www.darksky.org

SO. NM Star Party, 04/07to04/10,

Faywood NM [www.astronomy-](http://www.astronomy-national-public-observatory.org)

[national-public-observatory.org](http://www.astronomy-national-public-observatory.org)

Desert Starlight– Carlsbad NM

04/08 to 04/10

www.livingdesertastronomy.com

Other Astronomy Organizations

CO Springs Astronomical Society

www.csastro.org

Denver Astronomical Society

www.denverastrosociety.org

Longmont Astronomical Society

www.longmontastro.org

Northern CO Astronomical Society

www.ncastro.org

Western CO Astronomical Club

www.coloradowestastronomy.org

For complete list of all astronomical organizations goto:

www.amsky.com/whitepages

Science News 02/12/05 Vol. 167 # 7, article title "Proton storm erupts from the sun" by Ron Cowen

Between Jan.15 and 20, a single collection of sunspots erupted seven times. Four of these events event hurled into space powerful X-ray-emitting flares accompanied by billion-ton clouds of charged particles. The eruptions themselves weren't record breakers, but one was accompanied by a storm of high-energy protons that was the most energetic proton squall that's been recorded near Earth in 15 years.

The storm, detected by a weather satellite within minutes of a Jan. 20 solar flare, was particularly rich in protons packing more than 100 million electron-volts (MeV) of energy. Protons of this energy can burrow through 11 centimeters of water. The proton storm caused several satellites to shut down temporarily. Among these were the infrared Spitzer Space Telescope and Gravity Probe B, a mission to test Albert Einstein's theory of gravitation.

Earth's thick atmosphere and magnetic field shielded the planet from these high-energy protons and other forms of solar radiation. But this storm was so intense that detectors on the ground recorded elevated numbers of energetic neutrons. These are typically generated when a burst of protons with energies greater than 500 MeV bombards the atmosphere.

A cloud of slower-moving charged particles, known as a coronal mass ejection, arrived near Earth about 36 hours after the proton barrage, treating Europeans to one of the brightest auroras in years. Scientists are uncertain whether the energetic protons were accelerated by the Jan. 20 flare itself or by a coronal mass ejection associated with the eruption, says Bernhard Fleck, a European Space Agency astrophysicist based at NASA's Goddard Space Flight Center in Greenbelt, Md.

Science News 02/19/05 Vol. 167 #8, article title "Meteorite on mars" by Ron Cowen

Opportunity, one of the twin rovers on Mars, has discovered the first meteorite on a planet other than Earth. Initial observations, taken from a distance with the rover's thermal-emission spectrometer, indicated that the pitted, basketball-size body is a metal-rich meteorite. Driving close enough to use its X-ray and gamma-ray spectrometers, Opportunity confirmed the object's meteorite status and revealed that it's made mostly of iron and nickel, NASA announced on Jan. 21.

The metallic composition indicates that the rock came from an asteroid or planetary chunk large enough for its mixture of minerals to have separated into a dense, metallic core and a lighter, rocky mantle, notes rover researcher Steve Squyres of Cornell University.

Scientists have dubbed the meteorite Heat Shield Rock because it lies near debris from Opportunity's heat shield in Meridiani Planum, the cratered plain where the rover landed on Jan. 24, 2004. Metal-rich meteorites are relatively rare on Earth, and scientists have hypothesized that Mars is also bombarded by many more rocky meteorites than metallic ones, notes Squyres. Other clumps of material seen at the surface of Meridiani Planum may be rocky meteorites, he suggests.

Given the multitude of meteorites that scientists have already studied on Earth, meteorites on Mars are more interesting for what they might reveal about the Red Planet than about the rocks themselves. For example, determining the number of exposed meteorites at Meridiani Planum could indicate whether the

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

Editor – Michael Verry
Ph # 719-547-7957
e-mail
rmacmikebrdmmbbr@yahoo.com

Binocular & Small Telescope
Objects -- Late 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.

flatland is gradually eroding or being built up by ongoing geophysical processes.

Science News 02/19/05 Vol. 167 #8 article title "Spying Saturn's Light Show – Anomalous aurora dazzles scientists" by Ron Cowen

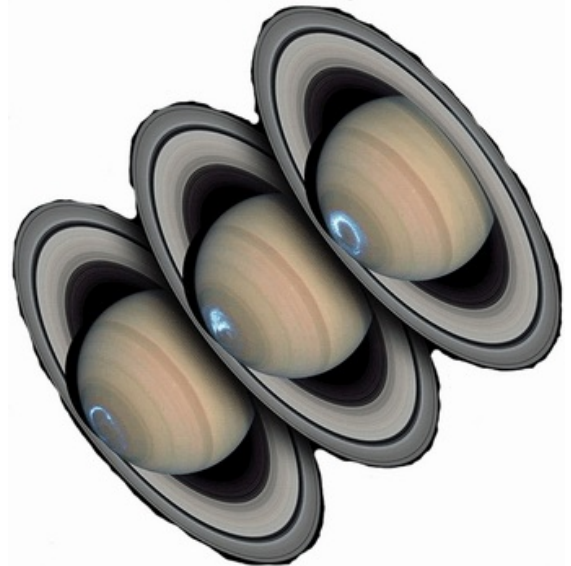
Among the solar system's auroras, the dancing lights that paint Saturn's skies show a distinct style. Three reports in the Feb. 17 Nature describe a choreographed experiment conducted 13 months ago, in which the Earth-orbiting Hubble Space Telescope and the Cassini spacecraft, then en route to Saturn, both examined Saturn's south pole. Hubble took ultraviolet pictures of Saturn's auroras while Cassini recorded radio emissions from the same regions of the planet. Cassini also measured the solar wind, the flow of charged particles from the sun.

Auroras, such as Earth's northern lights, arise when charged particles from space strike a planet's magnetosphere, the bubble-shaped region defined by a planet's magnetic field. Particles streaming into the upper atmosphere collide with atoms and molecules there and produce flashes of radiation ranging from ultraviolet to radio wavelengths.

Scientists have made detailed observations of auroras only on Earth, Jupiter, and now Saturn. Earth's auroras are driven by charged particles from the solar wind. The particles driving Jupiter's auroras come from gases spewed by that planet's volcanically active moon Io. On Saturn, auroras might arise either from the solar wind or from material evaporating from a moon.

Even though there are similarities among the different planets' auroras, Saturn's stand out in several ways. Following an outburst from the sun, Saturn's auroras become brighter, as do auroras on Earth. But on Saturn, the intensifying light then shrinks, becoming confined to high latitudes. On Earth, in contrast, strong auroras tend to expand to lower latitudes. Auroras on Jupiter remain relatively constant in both intensity and extent.

Frank Crary of the Southwest Research Institute in San Antonio and his colleagues found that Saturn's auroras strengthened in response to



Persistent Saturnian Auroras
Credit: J. Clarke (Boston U) & Z. Levay (STScI), ESA, NASA
<http://antwrp.gsfc.nasa.gov/apod/archivepix.html>

The Stargate Observatory, located in Canon City, CO and owned by RMAC member Steve Abraas. The observatory houses a Sky Watcher 6-inch refractor with an 80mm finder scope and a Meade ETX-105, which Steve uses as a photographic tool while he guides through his refractor. RMAC members can contact Steve as abraas610@netzero.net and can visit his website at www.Stargateobservatory.com. The observatory is open to other RMAC members for celestial viewing. His website contains information on the observatory and some images he has taken.

"Spying Saturn's Light Show – Anomalous aurora dazzles scientists" Continued from page 3.

increased pressure from the solar wind but not to the alignment of the wind's magnetic field. On Earth, auroral activity is strongest when the solar wind's magnetic field opposes that of the planet.

Saturn's auroras also differ from Earth's in that they become brighter on the sector of the planet where night is turning to day. On Earth, it's just the opposite—the aurora appears brighter where day is turning to night. Saturn's auroras also have their own shape. On Earth and Jupiter, auroras form a ring, but on Saturn they often appear as a spiral.

Theorist Stan Cowley of the University of Leicester in England has modeled the aurora's spiral-forming process and suggests that the shape is triggered by sudden gusts of solar wind. In his model, these gusts liberate gas from one side of Saturn's magnetosphere, and the gas is then swept up and heated by Saturn's rapid rotation to form the glowing spiral.

Cassini entered orbit about Saturn last summer, about the same time that Hubble's main ultraviolet detector failed. This week, Cassini researchers plan to reexamine the planet's aurora by coordinating observations with another detector on Hubble.

RMAC Board Highlights

RMAC Board Meeting highlights: 1) Voting for the new merged club name will be voted on at the 03/14/05 meeting. Simple majority vote. Email votes will be counted. 2) The club is applying to the Astronomical League. Costs for joining are \$5/member and a \$10 fee. You will be kept informed of the progress and costs.

This year will be more interesting and productive than last year. We are now working on star occultation by asteroids and sending the data to a national organization. The organization can make profiles of the asteroid using the collected data.

The observatory telescope will have several adjustments to it and then a flip mirror and the CCD camera will fit on the telescope at the same time. This will allow CCD images and visual images at the same viewing session. Also more access to the CCD camera for imaging celestial objects by club members.

The club will be working on detecting asteroids with the telescope and CCD camera.

Also, any club member pet projects or additional viewing sessions can be easier to arrange.

The program for March 14, 2005 is "Archaeo-Astronomy" by Chuck Percival.

The next Public Star Watch, on March 5th, 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, on March 12th, will be at the N. Fishing Area #1, a new location to be tried out by the club members. Start time at least an hour after sunset. Viewing gets better after the twilight.

Directions to N. Fishing Area #1: from Pueblo take Hwy 50 west to McCulloch Blvd. Turn south on McCulloch Blvd. Several miles (not sure of exact distance) there is a green sign indicating the entrance to Lake Pueblo State Park, turn south on Nicholas Road. Just before the park entrance make a right hand turn onto a dirt road. This road also leads to Turkey Creek. Stay to the left after the going over the bridge, then stay on the main road till it ends, about 2 miles. This area also is good viewing of any eagles that happen to be around and the nesting poles are within view. There is a restroom facility at this area. If you have any questions with the directions, feel free to contact me, Michael Verry 547-7957. I may have better distances later this week.

On 03/06 at 11:51 PM Ganymede makes a shadow on Jupiter and several of us will view and try to capture the image. The same is on 03/16 at 11:39 PM with the moon Io.

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 rmacmikebrmmbr@yahoo.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 will return your photo/slide/negative. If you would like to see something in the newsletter or would something changed, submit your request.

The dues for RMAC are as follows: Individual member – \$18.00/yr, Family member – \$20.00/yr. Dues are pro-rated for new members by the quarter year. Regular member dues are due at the beginning of the year. Contact one of the Board members on page one for more information.

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

Mercury is viewable before sunset starting March 01st, and shines at a mag of -1.4 and is 6° above the horizon. Greatest elongation on March 12th and will shine at a mag of -0.4 and will be 11° above the horizon.

Saturn will be rising around 7 PM this month and will be at a mag of -0.2 and will present good viewing of its rings. Jupiter shines at a mag of -2.4 . March 6/7, Jupiter's moon Ganymede will produce a shadow on Jupiter. Starting 11:39 PM and crosses in 2 hours & 12 minutes. March 16/17, Jupiter's moon Io will produce a shadow on Jupiter. Starting 11:39 PM and crosses in 2 hours & 12 minutes. Mars is around 2 AM on 03/01 & shines at a mag of 1.1.

To the west there are faint meteors all March, but you will need dark, clear skies. Comet Machholz passes between Polaris and Draco. This comet is easily seen with binoculars or naked eye in very dark locations. Look for the tail.

Scientific American, October 2004, Vol. 291, #4, Article title "A Universe of Disks" by Omer Blaes Part 3 of 4.
An Astronomical Racetrack

Fortunately, A spectacular breakthrough in the turbulence problem came in 1991. Steven Balbus and John Hawley of the University of Virginia realized that if the material in the accretion disk was highly electrically conductive and magnetized, even if only weakly, then the magnetic field would produce a fluid instability in the disk. The instability would invariably cause a turbulent flow that would transport angular momentum outward and dissipate gravitational binding energy. This effect, which was called the magnetorotational instability (IMIRI), is now believed to play a central role in the way many accretion disks operate.

Magnetic field lines in a highly conductive medium must move with the medium's underlying flow. Where the material goes, so goes the field. Magnetic field lines also exert forces on the medium. In particular, just like elastic strings, the field lines exert tension forces when they are bent or curved.

To understand the effect of magnetic field lines, imagine two particles in orbit about Earth that are tethered together by an elastic coil. If the particles are momentarily pulled apart (with one particle moved a bit closer to Earth and the other a bit farther away), most people would assume that the resulting tension in the coil would cause them to snap back to their original configuration. If the tension is sufficiently weak, however, its presence can actually drive the particles farther apart. The particle moved inward must speed up in its orbit to conserve angular momentum, and the particle perturbed outward must slow down for the same reason. The stretched coil acts to slow the faster, inner particle and speed the slower, outer particle. Deprived of some of its kinetic energy, the inner particle falls farther inward (and paradoxically speeds up in its orbit), while the velocity boost flings the outer particle farther out (where it moves even more slowly). In effect, the coil is transferring angular momentum from the inner to the outer particle. In an accretion disk composed of charged particles, magnetic field lines work in exactly the same way.

The discovery of the MRI has revolutionized our understanding of accretion disks. Now astrophysicists have deduced the mechanism that powers even greater energy sources such as quasars and active galactic nuclei (highly energetic galactic cores that are also thought to be fueled by matter falling into supermassive black holes). Researchers are currently exploring how MRI turbulence works in different physical situations and how that might explain the observed deviations in behavior among various types of accretion disks.

My group and others are trying to figure out how MRI works in hot, opaque accretion disks around black holes. The turbulence in these disks can be effectively supersonic, forming and reforming shock waves of charged particles just as supersonic aircraft produce sonic booms. Because these motions can kick photons to high energies, and because the photons can move more easily through the relatively transparent regions between shock waves, MRI turbulence can produce characteristic patterns of radiation that astronomers should be able to observe from black hole systems.