

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 # 263-54583

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 & Public Star Watch

Dec. 11th At the Raptor Center & CSUP Observatory.

★ December 2004  Volume # 3 Issue # 12 ★

 **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.

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

Picture top left :A Sharper View of a Tilted Planet

Credit & Copyright: Lawrence Sromovsky, (Univ. Wisconsin-Madison), Keck Observatory

Welcome and greetings from the RMAC Board & Editor.

Regular RMAC Meetings meet in the **Physics/Math Building room #126.**

RMAC meet every second Monday of the month.

The RMAC Board has proposed some changes to the Bylaws. The membership was sent the proposed changes. The 12/13/04 meeting will be a special meeting to vote on the proposed changes to the RMAC Bylaws, the proposed changes to the annual dues and the proposed merger with SCAS. A 2/3 vote of the membership is needed for the changes to take place. Family members get two votes. The proposed changes will make running RMAC smoother, the additional dues will provide funds to get the insurance from the Astronomical Society and the merger can benefit both organizations.

NASA still has the Mars rovers, Spirit & Opportunity, operating on the surface of Mars. They will continue until there is too much dust on their solar panels, which will no longer let enough solar radiation charge the batteries onboard.

The rovers have found several positive signs of Mars having water and there is the possibility of water below Mar's surface. To find more about the rovers and other NASA missions, log on WWW.NASA.gov.

Science News 04/17/04, vol 165 #16 Article title "**Sizing up a black hole**" by Ron Cowen

Astronomers are closing in on the dimensions of the supermassive black hole at our galaxy's center. By observing a strong source of radio waves emanating from the Milky Way's core, researchers have calculated that the black hole occupies a volume that would fit inside Earth's orbit around the sun.

Material spiraling into the central black hole emits intense radiation, including radio waves. Unlike visible light, radio waves can penetrate dust at the Milky Way's core, providing a window on the black hole's maelstrom of activity. That window, however, is not entirely transparent. Radio waves scatter off of electrons in the gas that lies between the black hole and Earth. The scattering, which is weaker at shorter radio wave-lengths, blurs the image of the radio-wave source, known as Sagittarius A*, that surrounds the black hole.

By modeling the effect of that blurring and by observing Sagittarius A* at a range of wavelengths, Geoffrey Bower of the University of California, Berkeley and his colleagues pinned down an upper limit on the size of the radio-emitting source. In so doing, the team has placed the "tightest constraint [ever obtained] on the size of the central black hole" powering Sagittarius A*, says Bower.

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

December 13-15, 2004

Geminids Meteor Shower

December 21, 2004

Winter Solstice.

For a list of all Star Parties goto:

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

Regional Star Parties

www.okie-tex.com/header.html

Texas Star Party

05/01 - 08/2005

www.texasstarparty.org

Desert Sunset Star Party, Arizona

05/04 - 08/2005

<http://chartmakers.tripod.com/sunsets.htm>

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 09/11/04 Vol 166 # 11 Article title "*Meteorites may have delivered phosphorus*" by Alexandra Goho

Phosphorus is an essential atomic ingredient in DNA, RNA, and cell membranes. But, compared with other must have elements such as carbon, hydrogen, oxygen, and nitrogen, phosphorus is the least abundant on Earth, says Matthew Pasek of the University of Arizona in Tucson. With so little phosphorus in the terrestrial environment, Pasek wondered how life could have emerged on Earth 4.5 billion years ago. The answer, he proposes, is meteorites.

Phosphorus occurs naturally on Earth in the form of the mineral apatite. However, previous experiments showed that dissolving apatite in water releases only small amounts of phosphorus, presumably not enough to have supported the origin of life. In recent years, evidence has been accumulating for the theory that meteorites supplied Earth with large amounts of organic material, providing the necessary building blocks for making the first forms of DNA, proteins, and cells.

Meteorites carry phosphorus mostly in an iron-nickel phosphide mineral known as schreibersite. So, the researchers mixed schreibersite with water to see what chemicals would leach out. They found that several different phosphorus containing compounds emerged, one of which was phosphate, a key player in photosynthesis and many other biochemical reactions. The amount of phosphate released from schreibersite was 10,000 times that produced by a similar watery preparation of apatite. The researchers suspect that iron meteorites brought phosphorous compounds to Earth since that type of meteorite is known to contain significantly more schreibersite than other types do.

Science News 09/04/04 Vol 166 #10 article title "*Sound power for deep-space travel beyond sun's reach.*" By Peter weiss

For voyages beyond Mars, sunlight is weak, so solar-power cells can't supply much electricity. For such missions, space-craft typically rely on thermoelectric generators, which contain materials that produce electricity in response to the difference in temperature between a hot mass of radioactive plutonium-238 and the chill of space. However, such generators convert only about 5 percent of heat into electricity.

Now, Scott N. Backhaus of Los Alamos (N.M.) National Laboratory and his colleagues have built a prototype power generator with much higher efficiency. It con-verts heat from the plutonium into acoustic energy and then into electricity.

Small enough to fit inside a microwave oven, the generator consists of a loop of metal tubing filled with high-pressure helium gas. Heat differences along the loop cause rapid expansion and contraction of the gas: sound. The oscillations drive a pair of pistons connected to wire coils inside a magnetic field, thereby generating electricity. The generator works with an efficiency of up to 18 percent. Because the loop's stiff tubing doesn't transmit acoustic vibrations to the out-side, the generator operates silently, Backhaus explains.

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

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

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

Binocular & Small Telescope
Objects
Fall & Early Winter

M 56, 57 in Lyra
M 29, 39 in Cygnus
M 27 in Vulpecula
M 71 in Sagitta
M 30 in Capricornus
M 02, 72, 73 in Aquarius
M 15 in Pegasus
M 74 in Pisces
M 77 in Cetus

— 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.

Science News 09/25/04 Vol 166 #13 article title "*Orbiting relativity test gets slow start*" by Peter Weiss

Unexpected but necessary adjustments to a satellite borne test of relativity theory have consumed more than a quarter of the 13-month period the mission had allotted to collecting data. On Aug. 27, the Gravity Probe B (GP-B) experiment, which was launched into Earth orbit on April 20, finally began what's now expected to be a 10-month run of gravity measurements.

Despite the anticipated short fall of data, the experiment should achieve the measurement precision originally expected, says Bob Kahn, a mission spokesman. As a consequence of the delay, however, observations of a reference star won't be as thorough and so won't give scientists as much backup data as planned.

The GP-B spacecraft is essentially a large liquid-helium tank surrounding a tube containing four gyroscopes and a telescope. With these components, mission scientists expect to monitor two effects predicted by the general theory of relativity. One of them is that Earth's gravity bends space-time in the planet's vicinity. The other is that the planet drags the fabric of space-time with it as it rotates. Those effects ought to be discernible as a subtle drifting of the gyroscopes' axes with respect to the reference star.

Editor note: The scientists in charge have said they will withhold the data until they are finished. Then they will release the data.

Scientific American 08/2004 Vol 291 #2 article title "*Sloshing in Space : Analyzing how liquids affect the motion of ships.*" by Govert Schilling

The diminutive Dutchsatellite Sloshsat FLEVO will study the sloshing behavior of water in weightlessness for two weeks. Sloshing liquid, be it propellant or drinking water, may hamper docking maneuvers of unmanned cargo vehicles servicing the International Space Station.

Sloshsat FLEVO (Facility for Liquid Experimentation and Verification in Orbit) is a simple satellite. Basically, it is an 80-centimeter cube covered with solar cells and outfitted with small thrusters. Inside the cube is an 87-liter tank filled with 33.5 liters of ultrapure water. Heaters prevent the water from freezing. Using its thrusters, Sloshsat FLEVO is made to shake, rattle and roll. Delicate sensors on the tank walls then measure the sloshing behavior of the water, while sensitive accelerometers gauge the resulting motions of the spacecraft.

Indeed, predicting, anticipating and even using the motions induced by sloshing liquids on spacecraft may someday become routine. Arthur Veldman, a computational fluid dynamicist at the University of Groningen, hopes that Sloshsat FLEVO will verify his computer models, which may then be used to gain precise control over satellite motions. "Eventually we want to develop slosh-proof space systems," he asserts.

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.

RMAC Board Highlights

RMAC Board Meeting highlights: 1) Liability Ins. was discussed, agreed upon and to get the best/most cost efficient price, the club will have to join the Astronomical League. Costs for joining are \$5/member and a \$10 fee. The insurance quote from the national organization's insurance co. was \$327.00 per year. (This quote may change after RMAC joins the Astronomical League. 2) In order to keep RMAC in the black, a proposal to increase annual dues was presented to the RMAC membership and will be voted on at the Dec. 13th meeting. 3) The merger proposal was presented to the RMAC membership and will be voted on at the Dec. 13th meeting. 4) The proposed changes to the bylaws was presented to the RMAC membership and will be voted on at the Dec. 13th meeting.

The next Club/Public Star Watch, on Dec. 11th, 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 program for Dec.13, 2004 is from a DVD teaching series "*Supernovas*".

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

Saturn will be rising around 7:40 PM at the beginning this month and will rise earlier as the month progresses. Saturn is at a mag of - 0.2 and will present good viewing of its rings. Dec. 24th, the Cassini Spacecraft will release the Huygens probe into Titan's atmosphere. With luck the probe will land on Titan without damage. Jupiter shines at a mag of - 1.9 and rises 1 AM at the beginning of the month. Dec. 07th the crescent Moon passes in front of Jupiter. Venus & Mars are viewable in the early morning before sunrise. Venus at a mag of - 4.0 & Mars at a mag of 1.6. Mercury joins Venus in the early morning before sunrise and shines at a mag of - 0.3. Uranus & Neptune are still visible early in the evening.

The Geminid meteor shower happens in mid-December. Peak on Dec. 13th / 14th, 2 days after the new moon. Peak time is 3PM, so our area will miss the best of the peak, but the peak has a broad width and our area should see many meteors. A new comet, Comet Machholz (amateur discovery), will be below Orion & near Lepus. Shines at a mag of 11, but predictions may have it at a mag of 4 in January.

Scientific American August 2004 article title "*The Darkening Earth.*" By David Appell

Much to their surprise, scientists have found that less sunlight has been reaching the earth's surface in recent decades. The sun isn't going dark; rather clouds, air pollution and aerosols are getting in the way. Researchers are learning that the phenomenon can interact with global warming in ways that had not been appreciated.

"This is something that people haven't been aware of," says Shabtai Cohen of the Institute of Soil, Water and Environmental Sciences in Bet Dagan, Israel. "And it's taken a long time to gain supporters in the scientific world." Cohen's colleague Gerald Stanhill first published his solar dimming results 15 years ago.

Estimates of the effect vary, but overall "the magnitude has surprised all of us," comments climatologist Veerabhadran Ramanathan of the University of California at San Diego. Stanhill and Cohen have pegged the solar reduction at 2.7 percent per decade over the period from 1958 to 1992. Put another way, the radiation reduction amounts to 0.5 watt per square meter per year, or about one third (in magnitude) of the warming that takes place because of carbon dioxide buildup in the atmosphere.

A separate analysis by climatologist Beate Liepert of Columbia University and her colleagues has found a 1.3 percent per decade decrease in solar radiation over the period from 1961 to 1990, with especially strong declines in North America. That's a total decline of up to 18 watts per square meter, out of the 200 watts per square meter or so that reaches the earth's surface.

A key culprit appears to be aerosols—micron-size particles (or smaller) consisting of sulfates, black and organic carbon, dust, and even sea salt. Aerosols have already been implicated in cooling tendencies, such as the slight decrease

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.

in global temperatures seen from about 1945 to 1975. Besides keeping temperatures from rising even higher than they already have, the aerosols complicate the modeling of global warming. The particulates act as the nuclei points for cloud condensation. They can lead to more cloudiness—a phenomenon called the indirect aerosol effect—which reflects sunlight away.

Solar dimming has consequences for the hydrological cycle as well. By the conventional wisdom, higher global temperatures mean that more water evaporates from the seas and falls as rain on land. But on a planet dimmed by aerosols and clouds, water vapor and rain stay in the atmosphere about half a day longer than they would in a non-aerosol world, according to Liepert's simulations. "All this debate on global warming is always discussed in terms of temperature," Liepert remarks. "I think we really have to discuss it more in terms of energy balance and water balance."

Cohen notes that the dimming effect could have consequences on farming—as a rule of thumb, agricultural productivity of light-loving plants such as peppers and tomatoes declines by 1 percent for each 1 percent decline in sunlight. Some plants, though, do better in more limited, diffuse light.

Science News 11/27/04 Vol 166 #22 article title "*Spinning Earth drags space*" by Peter Weiss

Our rotating planet's tug on space-time, known as frame dragging, takes place almost exactly as specified by relativity theory, report Ignazio Ciufolini of the University of Lecce in Italy and Eric C. Pavlis of the University of Maryland in Baltimore in the Oct. 21 Nature.

The theory predicts that the two satellites LAGEOS and LAGEOS2 should be dragged about 2 meters in the direction of Earth's rotation as they orbit. Using 11 years' measurements from laser beams bounced off the satellites, Ciufolini and Pavlis found 99 percent of the expected orbital shift. "This is the first accurate measurement" of frame dragging, claims Ciufolini.

Until recently, measurements of gravity variations around the world had lacked accuracy, fueling distrust of frame-dragging results based on those numbers. Still, skepticism about the laser method lingers, especially from researchers associated with a space experiment known as Gravity Probe B. Using a gyroscope-based technique, that mission is expected to report by 2006 a frame-dragging result at least 10 times more precise than the latest finding.

Science News 09/18/04 Vol 166 #12 Article title "*Beryllium data confirm stars' age*" by Ron Cowen

Astronomers have gathered additional evidence that stars began forming when the universe was less than 200 million years old. Although first-generation stars have never been observed, researchers can determine their age by measuring concentrations of heavy elements in the second generation of stars. The greater the time elapsed between the birth of the first stars

and of the next generation, the greater should be the concentration of heavy elements in the second generation.

One complication of this approach is that most heavy elements, considered by astronomers to be anything beyond helium were not evenly distributed in the early universe. Therefore, measuring the amount of, say, carbon in a few stars that formed long ago may not reflect the average cosmic concentration of that element at that time. Beryllium is a welcome anomaly. The early universe's supply of beryllium formed in the aftermath of collisions between heavy and light nuclei from dying stars. The high-speed collisions dispersed the beryllium evenly in space.

Using a spectrometer at the Very Large Telescope in Paranal, Chile, Luca Pasquini of the European Southern Observatory in Garching, Germany, and his colleagues have for the first time detected beryllium in two of the Milky Way's oldest stars, residing in the globular cluster NGC 6397. The minuscule amounts of beryllium detected indicate that only 200 million to 300 million years elapsed between the first and second generations of stars. Various evidence shows that the cluster NGC 6397 is 13.4 billion years old. With other observations pegging the universe's age at 13.7 billion years, the first stars must have formed less than 200 million years after the Big Bang, the team reports in an upcoming *Astronomy & Astrophysics*.