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Stars and Scopes

Newsletter of the Rocky Mountain Astronomy Club
www.rmastronomy.org

RMAC Officers for 2003

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Sky-watchers were treated to a full lunar eclipse on Saturday, November 8, 2003.. Photograph courtesy of RMAC member Klaus Priebe.



Upcoming Events

Dec 8 – **Board Meeting**, 6pm, **Club Meeting** and Program, 7pm at Colorado State University, Pueblo

Dec 13 – **Public Star Watch**, 7pm, at the Raptor Center, Pueblo, CO

Jan 12 – **Board Meeting**, 6pm, **Club Meeting** and Program, 7pm at Colorado State University, Pueblo

Feb 9 – **Board Meeting**, 6pm, **Club Meeting** and Program, 7pm at Colorado State University, Pueblo

Clear Skies Provide View of Lunar Eclipse

CNN.com Web site

Sky-watchers in every continent but Australia reveled in the relative rarity of a total lunar eclipse Saturday night—but as stargazers have noted for centuries, it was a matter of celestial perspective. "From the moon, they're having a solar eclipse," said Dean Regas, an astronomer at the Cincinnati Observatory Center. A lunar eclipse occurs when the moon, Earth and sun are in alignment and the moon passes through the planet's shadow.

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Ejecting the Kuiper Belt

David Tytell, Sky & Telescope Website

It's been a little more than a decade since astronomers confirmed the existence of the Kuiper Belt — the ancient disk of planetesimals circling the Sun outside the orbit of Neptune. In that time astronomers have found more than 700 icy, asteroid-size objects in the classical Kuiper Belt and have learned that it has a sharp outer edge around 50 astronomical units from the Sun. There seem to be no objects larger than 200 kilometers in diameter beyond that boundary.

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Celestial Events

December 2003

Saturn; will be at its highest point in the sky in 30 years around midnight.

December 14, 2003

Geminid Meteor Shower; hourly rate of 75 meteors.

December 29, 2003

Comet 2P/Encke at perihelion, with a maximum of 4 mag.

June 8, 2004

Watch for a **transit of Venus**, observers in North America will only be able to view the end of the event at sunrise.

October 28, 2004

Total Lunar Eclipse; this event will be well placed for Observers in North America.

Regional SPs

February 16-21, 2004

Winter Star Party, near Key West, FL. For more information, go to: <http://www.scas.org/wsp2004.html>.

May 16-23, 2004

Texas Star Party, near Fort Davis, TX. For more information, go to: <http://www.texasstarparty.org>

June 12-19, 2004

Grand Canyon Star Party, at Yavapai Point. For more information, go to: <http://www.tucsonastronomy.org/gcsp.html>

Lunar Eclipse, continued from page 1

Unlike in May, when the last total lunar eclipse was visible from North America, the sky was mostly clear Saturday night (November 8)—except for light, feathery clouds at the moment the moon was totally covered, about 8:10 p.m. EST.

Total lunar eclipses can range in color—from dark brown and red to bright orange, yellow and even gray—depending on how much dust and clouds are in the Earth's atmosphere. Saturday night's eclipse appeared light red to many people and brownish to others.

Residents of the eastern United States could view the eclipse from beginning to end, about 6 p.m. to 10 p.m., but it was already under way when the moon rose around sunset in the West.

Lunar eclipses are expected on May 4 and October 28 next year, but the first will not be visible from North America, according to the National Aeronautics and Space Administration.

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 email me at kpphoto7@hotmail.com. Thanks! —Klaus

RMAC Officers for 2004

The elected RMAC officers for 2004 are as follows:

Phil Brown, President, pdndlbrown@msn.com
Bill Brown, Vice-President, william.brown@colostate-pueblo.edu
Walt Russell, Treasurer, wdrussell1@juno.com
Bob Adams, Secretary, bovi9@aol.com
Mike Verry, Member-at-large, rmacboardmem5@juno.com

The appointed RMAC officers for 2004 are as follows:

Mike Verry, newsletter editor, rmaceditor1@juno.com
Debbie Schermerhorn, webmaster/design, astrogirl@astrogirl.org
Brian Paulson, webmaster/technical, spectre013@spectre013.com

Thank you to the officers who volunteered their time and efforts for the club in 2003. We thank you all for your contributions and leadership!

Ejecting the Kuiper Belt, continued from page 1

But it remains unclear how the Kuiper Belt came to be. A new study published in the November 27th *Nature* by Harold F. Levison (Southwest Research Institute, Boulder) and Alessandro Morbidelli (Observatoire de la Côte d'Azur) sheds some light on the mystery. Their work suggests that Kuiper Belt objects formed inside the present orbit of Neptune and that the planet itself gradually pushed them outward.

The biggest issue surrounding Kuiper Belt formation is the "missing mass problem." For the objects to form in their current locations like normal planets do, they would have needed an environment 100 times denser than exists there today — totaling about 10 Earth masses of material instead of the 0.1 Earth mass observed. Scientists have modeled various solutions to get rid of 99 percent of the original disk, but each fix requires that Neptune winds up well outside its current location.

Levison and Morbidelli instead propose that the primordial solar system stretched from the Sun to about 30 a.u. and that Neptune originally formed at 20 a.u. Over time, as objects came close to the gas giant, they were ejected. Some were thrown outward into wider orbits and others were tossed inward toward the Sun to encounter Uranus, Saturn, or Jupiter.

In each interaction Neptune exchanged orbital energy with the ejected body. Sometimes it lost energy, which drifted the planet in toward the Sun; sometimes it stole energy and widened its orbit a skosh as a result. But on average Neptune gained more energy than it lost, so eventually the planet crept through the planetesimals, dust, and gas between it and the edge of the disk. It stopped at 30 a.u. when there weren't any more planetesimals to steal energy from. It has remained there ever since.

Thus the Kuiper Belt we see beyond Neptune today represents the last fragmentary evidence of Neptune's journey. Objects thrown inward eventually collided with Uranus, Saturn, or Jupiter or were flung out of the solar system by them. Objects sent far outward were lost to space forever. Only bodies lucky enough to land in or migrate between one of the many stable orbital resonances with Neptune survived. Indeed, Levison notes, the current edge of the Kuiper Belt "appears to be at exactly the same location as Neptune's 1:2 resonance."

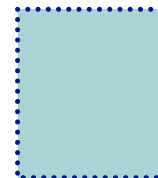
New RMAC Newsletter Editor

Please welcome Michael Verry as the new RMAC Newsletter Editor. Michael is currently serving on the RMAC Board as Member-at-large and has been an active member of the Rocky Mountain Astronomy Club since its inception.

Michael will assume editorship of *Star and Scopes* with the January 2004 issue. Please address any submissions for the newsletter to him at: rmaceditor1@juno.com. Also, please be sure to contact Michael with any changes or updates to your mailing address or email.



Did Kuiper Belt objects (KBOs) like Quaoar form inside the orbit of Neptune rather in their current location in the outer solar system? New models indicate that Neptune may have ejected these planetesimals early in the solar system's past. Artist concept courtesy NASA and G. Bacon (STScI).



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We're on the Web!
See us at:
www.rmastronomy.org

RMAC Membership Dues for 2004

Please remember that your membership dues for the Rocky Mountain Astronomy Club will be due at the January meeting or by January 30, 2004 at the latest. The current membership dues are as follows:

Individual memberships	\$18
Family memberships	\$20

Club benefits include a subscription to *Stars and Scopes*, voting rights, discounts on astronomy books and magazines as well as full access to all RMAC functions and facilities.

Please make your membership payment to Walt Russell, RMAC treasurer. If you are unable to attend the January meeting, please mail your dues to Walt at 67136 Russell Road, Boone, CO 80125. Be sure to include your name, current mailing address and email for newsletter purposes. If paying by check, please make your check payable to: "RMAC"

A Call for Newsletter Submissions

If you would like to contribute an **article**, **observing report** or **astrophoto** to be published in *Stars and Scopes*, please send them to Michael Verry at **rmaceditor1@juno.com** or 1580 N Cheshire Drive, Pueblo West, CO 81007. When sending photos, please send them in **JPG format** and as large as possible.



Rocky Mountain Astronomy Club

Membership Application

Name _____

Date _____

Address _____

City _____ **ZIP** _____

Phone _____

E-mail _____@_____

Areas of interest in astronomy

What activities or programs would you like the club to have?

Are there any locations in the pueblo area you think would be good for star watches?

Do you own a telescope? _____ If so, what kind?

Are there any accessories or equipment you are considering buying?

Renewals/Individuals: \$18/yr **Renewals/Family:** \$20/yr

New Members/Individuals: Jan-Mar, \$18/yr; Apr-Jun, \$13.50/yr;
Jul-Sep, \$9/yr; Oct-Dec, \$4.50/yr

New Members/Family: Jan-Mar, \$20/yr; Apr-Jun, \$15/yr;
Jul-Sep, \$10/yr; Oct-Dec, \$5/yr

Make checks payable to: "Rocky Mountain Astronomy Club" or "RMAC"
Mail to: Walt Russell, 67139 Russell Road, Boone, CO 81025