April 2003
Volume 2, Issue 4

Stars and Scopes

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

Upcoming Events

Apr 5 – **Private Club Grand Opening,** 7 pm at the So. Colo. Observatory

Apr 12 – **Public Star Watch,** 7 pm at the So. Colorado Observatory

Apr 14 – **Board Meeting,** 6 pm, **Club Meeting** and Program, 7 pm at University of Southern Colorado

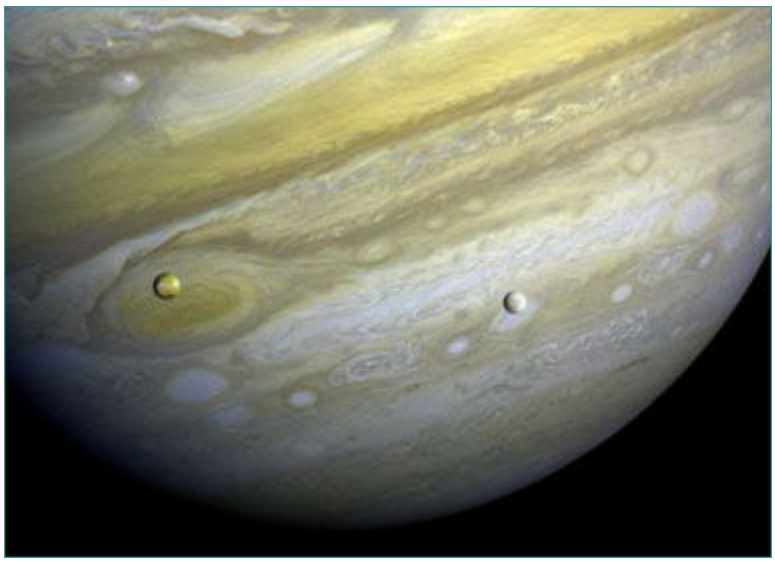
May 3 – **Club Star Party,** 7 pm at the so. fishing area, Pueblo Reservoir

May 12 – **Board Meeting,** 6 pm, **Club Meeting** and Program, 7 pm at University of Southern Colorado

May 15 – **Eclipse Watch,** To be announced

May 24 – **Public Star Watch,** 7 pm at the So. Colorado Observatory

May 31 – **Club Star Party,** 7 pm at Graneros Gorge



Jupiter's moon Io hovers above the planet's Great Red Spot while Europa hangs in the foreground to its right. A host of unusual observations can be made whenever two moons line up precisely with Earth or the Sun — something they do often until June 2003. Courtesy NASA/JPL.

Jupiter's Moon Dances

At rare times one of Jupiter's satellites can hide another with its own disk or shadow.

By Jean Meeus, Sky & Telescope

Jupiter's four large moons travel in orbits that are tilted only slightly to the plane of the ecliptic, and a popular observing project is to watch in a telescope as they pass in front of or behind the giant planet's disk. But twice in every revolution of Jupiter around the Sun, or roughly every six years, the satellites' orbits are presented so nearly edge on to our view

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Comet Juels-Holvorcem at Dusk and Dawn

By Paul Deans, Sky & Telescope

Comet C/2002 Y1 (Juels-Holvorcem) was discovered December 28th, 2002, by two amateur astronomers — Charles W. Juels (Fountain Hills, Arizona) and Paulo R. Holvorcem (Campinas, Brazil) — who were collaborating on an observing project via the Internet. The comet appeared as a fuzzy, 15th-magnitude object on CCD images taken with a 120-mm f/5.0 refractor in Arizona.

The comet has brightened considerably since its discovery and is now an easy binocular object in the constellation Andromeda. It's currently visible in both the evening sky (right after dark) and the morning sky (just before dawn). The view is better at dawn because the comet, as seen from 40° north, is higher in the sky than during the evening.

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Celestial Events

Jupiter and Saturn are at their best views—Saturn's rings at greatest openness

May 15, 2003
Lunar eclipse; Moon rises in eclipse—totality lasts 55 minutes.

August 27, 2003
Mars closest to Earth in many centuries. Don't miss it!

October 2003
Comet Encke; 3.3 year orbit will bring it close enough to almost see naked eye nice with binoculars or scopes.

November 23, 2003
Lunar eclipse; totality lasts 24 minutes

December 2003
At Midnight, **Saturn** will be at its highest point in the sky in 30 years. Spectacular viewing!

Regional SPs

April 27-May 4, 2003
Texas Star Party, Prude Ranch, near Fort Davis, TX. Hosted by TSP and AL Southwest Region, go to: http://www.metronet.com/~tsp for more info.

June 26-29, 2003
Rocky Mountain Star Stare, Pike Nat. forest near Tarryall, CO. Hosted by the Colorado Springs Astronomical Society, go to: http://www.rmss.org/rmss/index.htm for more info.

July 27-August 1, 2003
Nebraska Star Party, Merritt reservoir near Valentine, NE. Hosted by Prairie Astronomy Club and Omaha Astro Society, go to: http://www.nebraskastarparty.org for more info.

March Club Program

"The Motions in the Sky and Finding Your Way Around, part 3"

Bill Brown presented the third and final portion of his series on Making Sense of the Movements in the Sky and How to Find your Way Around. The series, based on the Fred Schaff book, ***40 Nights to Knowing the Sky,*** explained basic astronomy, terminology and methods used by amateur and professional astronomers. Bill began his discussion with an in-depth look at the **Moon and its features.** He explained that the Moon has a **synchronous rotation** which accounts for why only one "face" is turned towards the Earth at all times. He also explained that the notion of a "dark side" is incorrect since every portion of the Moon receives sunlight during its rotation and orbit. He also discussed **libation,** where the "wobble" of the Moon on its axis allows for extended portions of its limb or edge to be visible. This accounts for how we can see up to 59% of the Moon's surface during any given month.

Bill continued his series with a more in-depth look at the **planets** and **variable stars.** He also discussed **comets and their origins.** Bill explained the differences between short-period and long-period comets and gave some examples of short-period comets—those occurring 200 years or less. Most originate from the Kuiper Belt and as close in as Jupiter and have highly elliptic orbits. Long term comets, on the other hand, tend to originate from the Kuiper Belt and the Oort Cloud. Many short-term comets do not survive their first encounter with the Sun due to being pulled to the Sun's surface by it's gravitational force. Bill explained that comet tails always point away from the direction of the Sun while their debris trails always follow the path of the comet. Bill concluded his discussion with a look at **asteroids** and took questions from members and visitors. **Many thanks go to Bill for his excellent presentation!**

This month: Our April guest speaker will be Phil Brown who will give a hands-on discussion of Starry Night Pro software for navigating the night sky.

Comet Juels-Holvorcem

(continued from page 1)

From the end of March until mid-April, Comet Juels-Holvorcem is predicted to be a 5th-magnitude object only visible just before dawn. Its perihelion passage occurs April 13th, after which the comet will no longer be visible to Northern Hemisphere skywatchers.

At the end of April, Southern Hemisphere observers finally get a chance to see the comet when it appears at dawn. Unfortunately, by then it will be 6th-magnitude and fading as it moves from Pisces to Cetus.

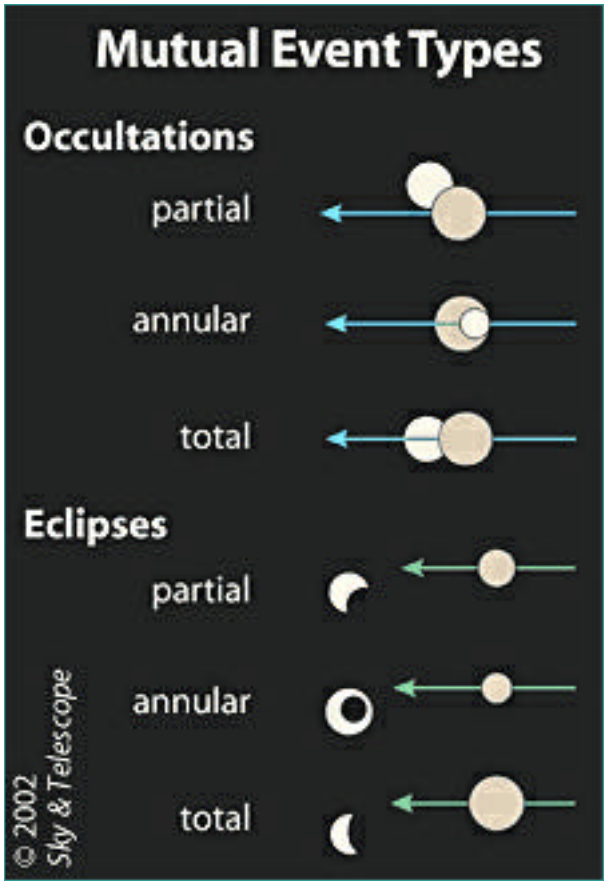
On January 25th Konrad Horn of Salem, Germany, imaged Comet C/2002 Y1 using a 100-mm, f/5 Genesis refractor with an Audine CCD camera. The tail is roughly 6 arcminutes long.

Jupiter's Moon Dance (continued from page 1)

that the satellites can be seen going behind or in front of each other. The geometry favoring these **"mutual events"** lasts for a number of months, and a new season is well underway.

Because these events normally last just a few minutes, careful timings of them can serve as a valuable check on the mathematical expressions used to describe the moons' motions over many centuries. (To contribute to such efforts, visit the PHEMU03 Web site at http://www.bdl.fr/Phemu03/phemu03_eng.html) Even when two moons appear too close to be distinguished in a small telescope, the drop in their combined light can be quite noticeable. Historically, before visits to the Jovian system by the Pioneer and Voyager spacecraft, Earth-based observations of mutual events provided our most reliable clues concerning the surface characteristics of the individual moons.

These events also offer extraordinary challenges for testing a telescope's resolution and image quality. Each satellite presents a disk only about 1 arcsecond across, so even a weak partial occultation provides a close "double star" whose orientation and spacing change rapidly before our eyes. Today's digital and video imaging techniques, which need less exposure time than film photography, should be capable of capturing these events with unparalleled clarity.



Mutual satellite events can occur in any of six ways, depending on slight differences in the moon's angular sizes and relative positions. Sky & Telescope illustration.

Mutual Events April-June, 2003

April 11 — Callisto occults Io
During the time when Callisto partially occults Io, both moons are in transit over Jupiter's disk.

June 8 — Ganymede eclipses Io
Io is in transit over Jupiter when eclipsed by Ganymede (which is also transiting).

June 15 — Ganymede occults Io
Both satellites are in transit over Jupiter.

June 22 — Ganymede occults Io
During this partial occultation, the angular separation between the satellites' centers undergoes two minima. The first is at 9:45 (with a magnitude of 38 percent), and the second is at 11:17 (37 percent).

Southern Colorado Observatory Grand Opening — April 5, 2003

All Rocky Mountain Astronomy Club members are invited to the Grand Opening of the new observatory on April 5th. This is a private event for the club that will begin at dusk (7 pm). Members will be able to test drive the 14" SCT "loaner" scope in the new facility and are encouraged to bring their own scopes to set up as well. Classes for observatory operators will also begin in April. If you would like to learn how to operate the SCO scope, please contact Bill Brown at brownwc@uscolo.edu or call him at 583-0354.

A Call for Submissions

If you would like to contribute an article to the RMAC newsletter, please contact Debbie Schermerhorn at astrogirl@astrogirl.org or PO Box 25396, Colorado Springs, CO 80936-5396.

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Flashlight LED Modification

All observers learn quickly that white light will destroy night vision. That is why they use red-lensed flashlights during their field observations. But even red-lensed flashlights can be a bit too bright and commercially made LED lights are costly. Instead, try making your own LED flashlight which will produce a true red light. To modify your own flashlight you will need the following: **A small standard flashlight** (I used a waterproof Sports version); **Super-bright LED** (Radio Shack #276-086); **100-ohm resistor** (Radio Shack #271-1311); **a soldering iron** and **soldering lead.**

1. Remove the light bulb from your flashlight.
2. Using a pair of pliers, place the bulb's glass tip in a napkin and crush or twist the bulb until the glass part comes off. Take care not to crush the metal holder while removing all traces of the bulb's glass and glue. It is the metal light holder that you will be modifying.
3. Place the tip of a hot soldering iron on the end of the metal light bulb holder where you should see a tip of solder. Hold the bulb holder so that the pre-soldered tip is facing up, and when hot enough, the remaining pieces of the bulb will fall out of the bottom.
4. Trim the positive lead on the LED as short as possible and solder the resistor to it.
5. Bend the negative lead on the LED up and out 90 degrees.
6. Heat the pre-soldered tip of the bulb holder and slip the positive LED lead into the hole, firmly soldering it where the bulb pieces once were.
7. Solder the 90 degree-bend negative lead to the outer case of the bulb holder.
8. Replace the bulb assembly into the flashlight, and you're done!