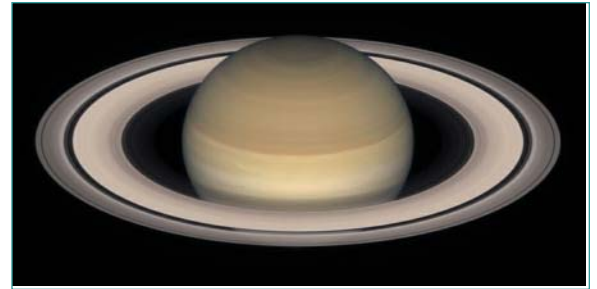




January 2003
Volume 1, Issue 20

Stars and Scopes

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



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Upcoming Events

Jan 4 – Club Star Watch, 7 pm,
Graneros Gorge, so. of Pueblo

Jan 13 – Board Meeting, 6 pm,
Club Meeting and Program,
7 pm, USC Tech Bldg., rm 244

Jan 25 – Star Watch, 6 pm,
Raptor Center, Pueblo

Feb 1–Club Star Watch, 7 pm,
Graneros Gorge, so. of Pueblo

Feb 10–Board Meeting, 6 pm,
Club Meeting and Program,
7 pm, USC Tech Bldg., rm 244

Feb 22 – Star Watch, 6 pm,
Raptor Center, Pueblo

Mar 1 – Club Star Watch,
location to be announced

Mar 10 – Board Meeting, 6 pm,
Club Meeting and Program,
7 pm, USC Tech Bldg., rm 244

Mar 29 – Star Watch, 6 pm, so.
Fishing area, Pueblo Res.

Observe a Ringed World

With Saturn putting on a fine show this winter, you'll want to explore the ringed planet at every opportunity.

By Alan M. MacRobert, *Sky & Telescope*

Ask amateur telescope users what's the most beautiful thing in the sky, and lots of them will say Saturn. In fact many say their first sight of it was what turned them on to astronomy. A view of Saturn in a good telescope often draws gasps from visitors, who after a lifetime of seeing cartoon ringed planets are awed by viewing the original. But you can never see Saturn as well as you want! The planet is tiny as telescopic targets go; it's barely 21" at its most favorable oppositions. Saturn's ring system is 2.25 times as wide as the ball — still smaller than the width of Jupiter near opposition. And the disk itself shows only about 1/6 the area of Jupiter. Try to magnify it too much and it defies you by turning into a blurry mess. Saturn is thus a jewel, exquisite but tiny.

However, with time, patience, and a top-quality 4-inch or larger telescope, you can tease out more of the planet's secrets than many observers suspect.

(continued on page 2)

Learning the Night Sky

"Making Sense of the Movements in the Sky and How to Find your Way Around;" Part 1

By Bill Brown

Beginning with January 2003, the presentation for the club meeting will address learning the night sky. The program will be based on the book called *40 Nights to Knowing the Sky* by Fred Schaaf. This will be part 1 of a series of discussions due to there being more to cover than can be done in a single night. These will be a very basic discussions and will not require any math skills. This is the time to get on board with the fundamentals . . .

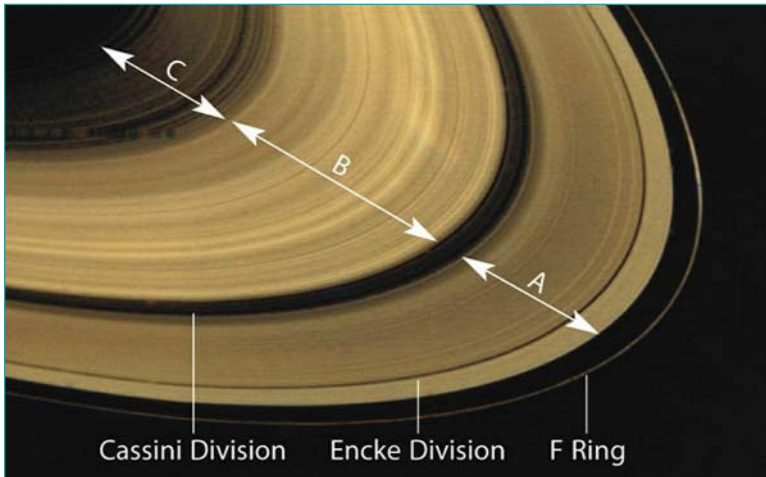
We will begin with the basic motions of objects in the sky and the sky itself. At the first meeting, we will specifically look at artificial lights; altitude-azimuth; stars, planets and the rotating Earth; the Moon's motion and its phases; artificial satellites; the Zodiac; the Superior planets; the Inferior planets; circumpolar and seasonal stars; and the Celestial Sphere. This will be your chance to "come up to speed" on beginning astronomy!



Observe a Ringed World (continued from page 1)

What to Look for

The **rings** should be visible in even the smallest telescope at 25x. A good 3-inch scope at 50x can show them as a separate structure detached on all sides from the ball of the planet.



Saturn has a more three-dimensional appearance than any other object in the sky — at least that's how it looks to me with a 6-inch scope on a night of fine seeing. The edges of the planet are limb-darkened, making Saturn look like a yellow-brown marble rather than just a disk, while the rings encircling it show no such effect and look as flat as a paper cutout. The **planet's shadow on the rings** adds to the 3-D appearance once you recognize the direction the sunlight is coming from and how the shadow is being cast.

The **rings' thin shadow on the planet** is subtler and visible only some of the time. It shifts from the inside edge to the outside edge of the ring system about every six months from our Earthly viewpoint. Saturn is prettier when the shadow is on the outside edge; a black line then divides the rings from the ball, improving the 3-D effect.

Details in the rings can be viewed with a small scope during spells of good seeing. The plainest is the black **Cassini Division** between the A and B rings. Its clarity is an excellent test of atmospheric steadiness and the telescope's optical quality. Shadings within the rings are even easier to discern. The outer A ring is plainly dimmer than the broader B ring inside it. To me, both the A and B rings usually seem to brighten smoothly to a maximum at the edges of the Cassini Division.

Dark belts and bright zones can often be made out on the ball. They're much vaguer than the similar belts and zones of Jupiter, but it's rare when my 6-inch reflector shows Saturn completely blank. And, of course, there are Saturn's many moons. A 2-inch scope will show **Titan**, and a half dozen are sometimes within reach of a 10-inch. That's about all Saturn displays to casual observers. But there's more.

Looking Deeper

In a high-quality planetary telescope of at least 6- or 8-inch aperture on a night of excellent seeing, the rings become quite a bit more interesting. About two-thirds of the way to the outer edge of the A ring is the **Encke Minimum**, a gray band. (At its outer edge is the extremely narrow Encke Division, which is almost never resolved separately.) On a night when the seeing was so steady I could use 450x on my 12.5-inch reflector, I observed the Encke Minimum well for the first time — a complex blur of threadlike details during moments when the air was perfectly steady.

The rings contain other thin, grayish minima in brightness. Julius Benton, the Saturn section coordinator for the **Association of Lunar and Planetary Observers (ALPO)**, claims that as many as 12 are detectable with large telescopes, "of which only about four show any real recurrent visibility from observing night to observing night." Interestingly, Benton claims these brightness minima are known to vary somewhat in both prominence and location.

Ring C, the crepe ring or dusky ring, can be difficult or easy to make out. Many have seen it without knowing it. Evidence of the C ring is easy to spot when the rings' shadow on the ball appears on their outside. At such times the duskiest you see against the planet just inside the B ring is the semitransparent C.

(continued on pg 4)

This enhanced color image of Saturn's rings was taken in 1981 by the Voyager 1 spacecraft, then 1.6 million kilometers above and beyond the planet. All the labeled portions of the Saturnian ring system, except ring F, are easily visible from Earth. Controversy surrounds the possibility that Earthbound observers may have seen ring F on several occasions in the 20th century. Click on the image to see the complete photograph. Sky & Telescope illustration; image courtesy NASA/JPL.

December Club Program

“Telescope Accessories”

Phil Brown gave an excellent program on telescope accessories to club members at the December meeting. He began the program by talking about **astronomy publications** as an essential accessory. Many people do not think about the many resources available to astronomers such as *Sky & Telescope* magazine or *Astronomy* magazine. Both publications offer amateur astronomers monthly star charts, ephemeris and product reviews. Another essential accessory is *StarWare* by Phillip Harrington. Considered the “Astronomer’s Bible,” Harrington’s book offers practical instruction and advice from a hands-on astro-veteran.

Phil continued his presentation with **collimation tools** as must have accessories. He stressed that even the best scope optics available will be useless if the scope is out of alignment. How can you tell if your scope needs a “tune-up?” Star images in the eyepiece should be crisp and sharp; if they are fuzzy and distorted, chances are that your scope could use an adjustment. Another way to test for alignment is to defocus a star and look for the defraction ring. If the center “dot” is off, your scope needs collimation (this method is known as star-testing). Phil suggested the Laser Max collimator due to its ease of use and target pattern. While good collimation tools are not inexpensive, they should be considered as an investment for the amateur astronomer.

Phil went on to discuss the merits of eyepiece filters. He handed out two comparison sheets showing the best uses for **light-pollution filters** and **colored filters**. Phil stated that many astronomers develop a personal preference for certain colored filters based on their performance. He stressed that an absolute must-have for every astronomer is a good quality **solar filter**. The most effective types cover the corrector plate or front spider to safely protect your eyes from heat and UV rays. An accessory to “forget” about . . . screw-on solar filters— you know, the ones that screw on to the bottom of an eyepiece. They are dangerous and ineffective in protecting your eyes from damage and resulting blindness.

Another beneficial accessory is a **2-power Barlow eyepiece**. With a Barlow, you can double the viewing range of your eyepiece collection – helpful if you only have a few good eyepieces to begin with. Phil also discussed the importance of a good **finder scope**. Several finder scopes were compared according to their strong-points. Once again, the type of scope you use will be a matter of personal preference.

Phil continued his presentation with a comparison of **star atlases** and **software programs**. Concerning an atlas, you will want one that is easy to read and understand. A personal preference of Phil’s is to use *Starry Night* to create his own personalized star charts. He can also run the program in the field from a laptop computer. Phil ended his discussion with “overlooked” accessories such as a good set of **binoculars**, a **red flashlight** and the importance of **warm, layered clothing**. **Some accessories to avoid:** *zoom eyepieces, flimsy mounts, dew heaters, cheap eyepieces, optics cleaning kits, poor quality focusers* and last of all – *inexpensive department store scopes and binoculars*.

RMAC Membership Survey Requested

Your opinion matters!

RMAC wants to know what direction the membership would like to see the club move toward. For instance, do you enjoy attending star parties at Graneros Gorge or at the Raptor Center? Is there another dark-sky site that you would like to suggest? Do you prefer attending meetings at the University of Southern Colorado or would you like to see the club hold monthly meetings at the new observatory?

This is your time to speak! We welcome your concerns and suggestions on how to keep Rocky Mountain Astronomy Club an exciting, enjoyable organization. Please send your survey to either **Phil Brown** or the **newsletter editor** – their contact information is on the front of the newsletter.



Celestial Events

January 4-5, 2003

Jupiter passes in front of M1, the Crab Nebula.

May 15, 2003

Lunar 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!

New Members

Welcome to **Richard Chaparro** and his family. We look forward to observing and getting to know you better!

Thank You!

I would like to extend the club’s gratitude to each of the 2002 RMAC officers. Each did an outstanding job – some even ran for a second term! Your 2002 RMAC Officers were . . . **Phil Brown**, president; **Bill Brown**, vice-president; **Walt Russell**, treasurer; **Bill Mott**, secretary & editor; **Michael Verry**, member-at-large.

A special thank you goes to **Bill and Sharon Mott** who served as the RMAC newsletter editors. Being the newsletter editor of any organization is a large task – you both did a terrific job and we appreciate all of your hard work and efforts!



Observe a Ringed World (continued from page 2)

Changes in the belts and zones become apparent, even obvious, to regular Saturn-watchers — one of the benefits of long-term study. Sketching them is the best way to record what you see. The larger and better your scope the more likely you are to see enough detail to note changes within it.

Spots and other markings occasionally appear amid the belts and zones. Major white eruptions happen about every 30 years (once per Saturnian year). Lesser bright and dark spots appear more commonly. To predict when a spot will be back at the same location, remember that Saturn's equatorial parts rotate once in about 10 hours 14 minutes. Higher latitudes rotate more slowly, in about 10 hours 38 minutes.

Colors change on Saturn too, but only subtly. The best way to pin them down is to note the relative brightnesses of different areas as seen through red, green, and blue filters. Oddly, the two ends (ansea) of the ring system sometimes appear to differ slightly in color. Using red and blue filters, see if one end looks brighter than the other in either color of light.

Overall, I find that a yellow filter sharpens up the whole planet a trace, probably by suppressing the differences in atmospheric turbulence at the far ends of the spectrum. (Red and blue images quiver and shimmer out of phase with the yellow near the middle of the spectrum. This is the same effect that causes the bright winter star Sirius to twinkle in vivid colors.) A light green filter may slightly improve contrast in the planet's belts and zones.

Saturn enthusiasts interested in long-term observing programs can learn more about the **ALPO Saturn Section** (<http://www.lpl.arizona.edu/~rhill/alpo/sat.html>) where observation forms are available online.

Stars and Scopes

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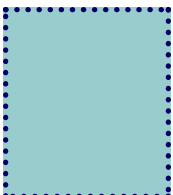
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