



The Prairie Astronomer

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Saturn's Clutter of Tiny Moons

The Saturnian system revealed by Voyager 2 is "icier, whiter, brighter, and junkier" than Jupiter's, according to JPL's Torrence V. Johnson. In addition to nine major satellites, there are spacegoing icebergs trapped in gravitationally stable Trojan points of the satellite Tethys, 60° in front of and behind it in its orbit. There is another iceberg in the Trojan point ahead of Dione. There are "co-orbital" satellites playing tag with each other in their common orbit just outside the rings, and there are two irregular "shepherd" satellites, one just to the inside and one to the outside of the pencil-thin F ring. There is a tiny "guardian" satellite just outside the bright A ring, and there are the billions of icy fragments in the rings themselves.

Eugene Shoemaker of the California Institute of Technology has formulated a tentative theory of what caused all that space rubble. As Shoemaker sees it, the outer solar system was aswarm with cometary nuclei in its early years. A conservatively estimated 100 billion dirty balls of snow and ice several kilometers in diameter orbited in irregular paths from Jupiter on out. Close encounters with the large outer planets tended to eject them from the solar system, and by about 3.5 billion years ago, most had joined the

Oort cloud, a vast spherical halo of iceballs surrounding the sun some 0.1 light year out. Only when a passing

(Continued on Page 4)

October Meeting

Election of club officers for the Class of 1981-82 will be held at the regular Prairie Astronomy Club meeting, Tuesday night, October 27, 7:30 p.m., at Hyde Observatory. Preliminary nominations were made at the September meeting, but nominations remain open until the balloting begins. Those nominated in September are:

PRESIDENT -- Russ Genzmer

VICE PRESIDENT-- David Knisely
Ron Veys

SECRETARY -- Merton Sprengel*

TREASURER -- Lee Thomas*

PROGRAM CHAIRMAN-- John Lortz

In addition to those incumbents running for re-election, designated by an asterisk (*), presidential candidate Russ Genzmer is the incumbent Program Chairman, and Ron Veys, a candidate for Vice President, is our incumbent President. (Ask yourself: Would Ronald Reagan run in 1984 to succeed George Bush?)

The program this month will be a slide-tape show on the space shuttle. This show was produced after the April launch, and contains the latest information.

PRESIDENT'S REPORT:

Next month you'll be reading a message from someone else in this space. By all appearances, that "someone" will be Russ Genzmer, since, at this time, he is the only nominee for the office of President. I honestly don't think you could have found a better man for the job. Russ has been in the club a little over two years and in that time I've come to know him as a very good friend. Russ is full of energy and dedication. When he joined the club, he knew, by his own admission, practically nothing about amateur astronomy, except that he was interested in learning about it.

Since then, he has studied the subject, worked his way through the Messier list with his 4½-inch telescope (receiving his M-Award at last summer's Regional Convention), been actively involved in all of the club's projects, served as our Program Chairman, and is presently building a 10-inch telescope. Without a doubt, he is now one of the club's most knowledgeable and seriously-involved members. He will make an excellent president.

For myself, I'd like to say thanks once more to all of you who have helped me out through these last three years as President. I've really enjoyed the experience, and I look forward to working on some pet astronomical projects of my own. Hopefully, I'll be sharing some of these with you in the future.

-- RON VEYS

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OBSERVING CHAIRMAN'S REPORT:

One complaint which I commonly receive from users of small telescopes is that they find it difficult to see many of the fainter objects which I list, such as galaxies and planetary nebulae. I think the problem here is that people try and find a few objects which are marginal in small instruments and fail miserably, making them give up entirely.

Galaxies and especially planetary nebulae are difficult to see. However, by properly choosing the object, many difficulties can be avoided. In my four year "internship" with a 2.4-inch refractor, I managed to see 12 galaxies and 2 planetary nebulae. (I'm sure others in the club could easily beat my score on this.)

Upgrading to an 8-inch reflector showed me the greatest problem present with small telescopes. The big problem is not the small size of the telescope but the size and quality of the finder. To locate deep sky objects, most people are forced to use the star-hopping method, but those miniscule finders make this almost impossible. You need at least 25 mm of clear aperture at about six power to see the faintest stars in the Skalnate Pleso Atlas clearly enough to recognize star patterns.

Most finders on small telescopes have a small single objective lens with an aperture stop inside the tube of the finder to control the chromatic aberration of a single lens. If it is possible, remove this stop. The stars may look a bit fuzzy, but at least you'll see them.

Next, make sure the finder holder

rings are firm. The finder must be lined up exactly with the field of view and must stay that way. If your finder or holder can't be made firm, go buy a new and larger finder (the bigger the better, in spite of what you may have read.)

After all this fabulous advice, try to find the giant Helix Nebula NGC 7293 in southern Aquarius. Look about a degree west of Upsilon Aquarii with a pair of binoculars for a faint fuzzy spot. This object is quite large, so those with large telescopes should use very low power and a wide field of view. Some vague detail can be seen with an 8-inch telescope.

--DAVID KNISELY

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Tirions Arrive; Handbooks And Calendars Yet To Come

If you ordered and paid for your Tirion Sky Atlas 2000.0, pick it up at the October meeting. At our press deadline, no RASC Handbooks, and no Hansen Wonders of the Universe -1982 Calendars had arrived. There is still a chance, however, so if you ordered either, don't miss the meeting.

Saturn System--from Page 1

star perturbs one of these objects back into the inner solar system do earthlings see it as a comet.

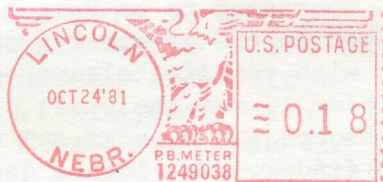
Before all these dirty snowballs were ejected, however, the outer planets--and their satellites--must have been subjected to a savage pummeling. The record is there on the crater-blasted faces of Tethys, Rhea, and Dione, and in the huge crater that nearly shattered little Mimas.

All this is well known and pretty well accepted. But Shoemaker goes a step further. He speculates that the satellites now in orbit around Saturn are not the original ones. The original system might have looked much more like the Galilean system of Jupiter, with several large bodies the size of Titan. Any such object would

have been large enough to begin internal differentiation, he points out. Rocky material would sink toward the center of a larger globe of ice, heating the body by the release of gravitational energy. The cometary bombardment would heat the object still more, until the ice was nice and soft--and then wham! A larger comet, perhaps 200 kilometers across, would blast it to smithereens. Only later, as the bombardment was tapering off, would the fragments reaccrete into the smaller satellites seen today.

Titan, in this picture, was the only original satellite to survive, probably because it was quite far out. Saturn's gravity would have focussed the cometary bombardment into the inner part of the system. Moons and the rings may be fragments of the original system.

THE PRAIRIE ASTRONOMER
c/o Prairie Astronomy Club, Inc.
P.O. Box 80553
Lincoln, Nebraska 68501



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