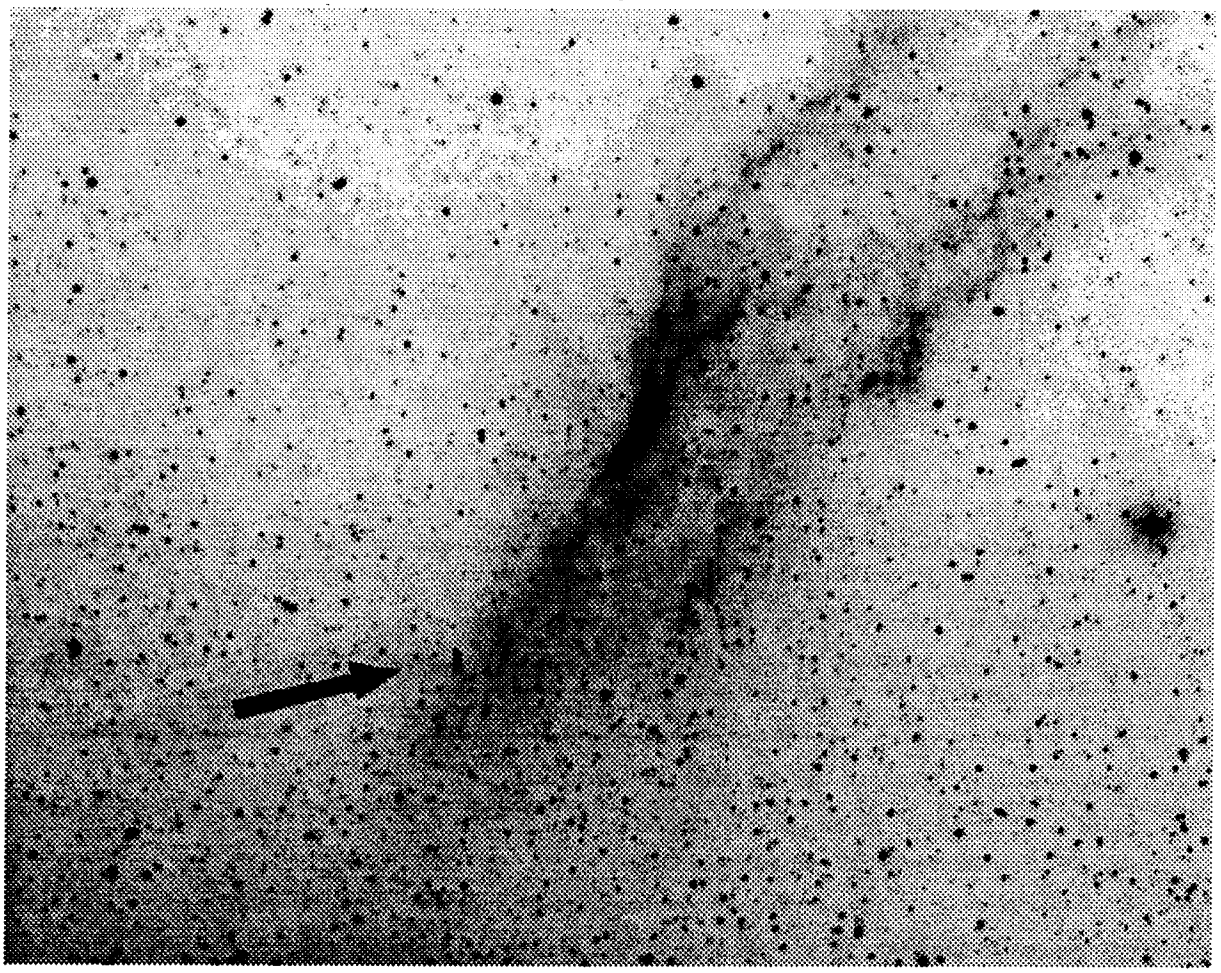
SASKATOON SKIES

Volume 24, Number 4 April, 1994



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In This Issue

Minutes of the March Executive Meeting

7:00 p.m., March 15, 1994
Room B-10, Health Sciences Building, U of S Campus

Present: Ed Kennedy, Richard Huziak, Scott Alexander, Sandy Ferguson, Gord Sarty, Al Hartridge

1. Meeting called to order 7:05 p.m.
2. Apologies for non-attendance from B. Hydomako, G. Brett, M. Williams. J. Young is with Mr. Broughton.
3. Any questions/concerns for Mr. Broughton at the General Meeting? (R. Huziak)
   The Centre will inquire about a) the status of the Journal/Bulletin, b) why there are so many committees at the national level.
4. Mike Wesolowski has donated some books and Astronomy magazines to the Centre. (R. Huziak)
   We will probably be able to complete our collection as a result. S. Ferguson suggests we could sell extra copies to raise funds.
5. Light Pollution Committee:
   (a) Calgary Herald ran LP articles by Calgary RASC. (R. Huziak)
   (b) IDA membership discussed. Cost is $20 USD. (G. Sarty) Motion that the Saskatoon Centre join the IDA: A. Hartridge; Seconded: S. Alexander; Carried unanimously. R. Huziak will inform M. Williams to pay the IDA for a one-year membership.
6. Telescope Committee report.
   (a) Executive requested to give OK to proceed with construction of 16 inch telescope. (R. Huziak) Costs are $500-$600 for mirror mount; $1000 for forks. Approved.
   (b) Cheque requested for 14-ft dome in Minnesota for $100 USD. (R. Huziak) Approved. M. Williams will be instructed to send a cheque to R. Brummond in Minnesota.
7. U of S Observatory display is mostly ready except for the titles. R. Huziak can get them printed. (S. Ferguson)
8. Librarian position is still vacant. S. Shadick declined the position when offered. (R. Huziak)
9. Observer's Group
   (a) *My Messier Album* presented to executive for approval for OG activity by R. Huziak. Copies the MMA will sell for $1.00 each to recover copy costs.
   (b) Astrobuddies update. (S. Ferguson) So far 6 people have requested "astrobuddies" and will be paired up. Sandy credits David Cornish for the good idea of beginning "astrobuddies".
10. Sky and Telescope subscriptions.
    (a) Info has been received. R. Huziak will ensure everyone is signed up OK. An article will appear in the next *Saskatoon Skies* explaining the rules.
    (b) Members also get a 10% discount on books from S&T due to the Centre registration program.
11. Promotional Materials: The following have been ordered:
    (a) 250 S&T reprints: *How to Get Started*
    (b) 120 Solar filter glasses from National Office
    (c) National has provided us with a list of RASC promo materials which will be forwarded to G. Brett.
12. Astronomy Day and Star Night: April 16, 1994. (S. Ferguson) The display will be at Market Mall, not Lawson Hts as previously suggested. Star night will be at Diefenbaker Pk.
13. Meeting adjourned 7:55 p.m.

APRIL GENERAL MEETING

The April General Meeting will be held on Monday, April 18, 1994, in Room A-226, Health Sciences Building, U of S Campus, at 8:00 p.m. This months presentation is entitled "Comets" and will be presented by Gord Sarty and Richard Huziak.

EXECUTIVE MEMBERS

There will be a regular meeting of the executive at 7:00 p.m. in Room B-10 on April 18.

Minutes of the March General Meeting

8:00 p.m, March 15, 1994
Room A-226, Health Sciences Building, U of S Campus

1. Meeting called to order 8:10 p.m.
2. Members welcomed, RASC described, J. Phillips and Mr. Broughton introduced. (R. Huziak)
3. Motion that the March minutes be adopted as published. (Motioner/Seconder not recorded). Carried.
4. Promotional items for sale:
   One 1994 RASC Calendars is still available for $6.50.
   Many Beginning Observer Guides, $9.50 each.
   Asteroid Charts 1994, $5.00 each.
   My Messier Album, $1.00 each.
5. Librarian executive positions yet to be filled. A call for nominations from floor. No nominations received.
6. Calgary Herald ran light pollution articles by Calgary RASC. (R. Huziak)
7. Astro-Buddies program described to the membership. (S. Ferguson)
8. OG Meeting set at April 9 with backup on April 16, 1994 (=Starnight).
9. Sky and Telescope subscriptions.
   (a) Info has been received. R. Huziak will ensure everyone is signed up OK.
   (b) Members also get a 10% discount on books from S&T.
10. Upcoming activities reports:
    (a) Astronomy Day and Star Night, April 16, 1994. Note the change to Market Mall. (S. Ferguson)
    (b) May solar eclipse will probably be a public event. (R. Huziak)
11. Call for new business: A supernova has been discovered in NGC 4526.
12. Presentation "What is the RASC?" by Mr. Peter Broughton, National President. Mr. Broughton presented a talk and slide presentation on the history of the RASC including the involvement of E. Kennedy and others in the early formation of the "modern" Centre. Mr. Broughton's book was displayed as well.
13. A question period followed Mr. Broughton's presentation. Mr. Broughton fielded many diverse questions from members.
14. Meeting Adjourned 10:15 p.m.

16-Inch Telescope Report

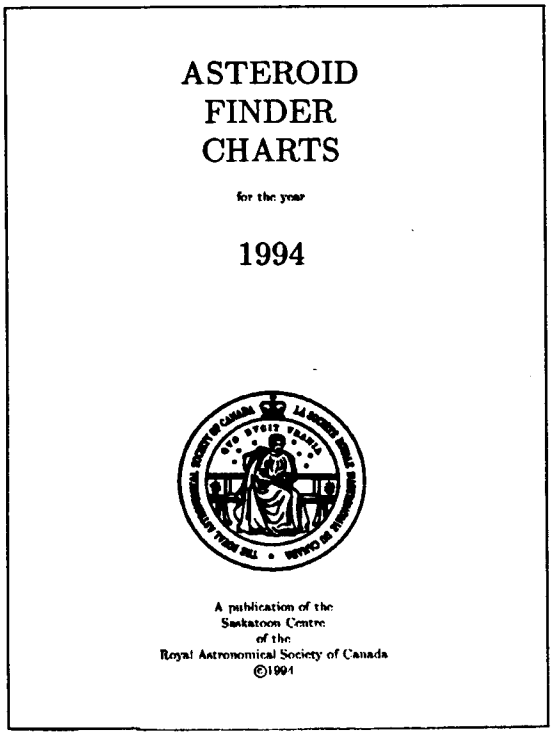
This is the second in the modern series of 16-inch reports. I do not have much to report in firm progress this month, though many fine details have been worked out. We have now officially purchased the 14-foot observatory dome in Minnesota and will have to go down there to pick it up later in the spring.

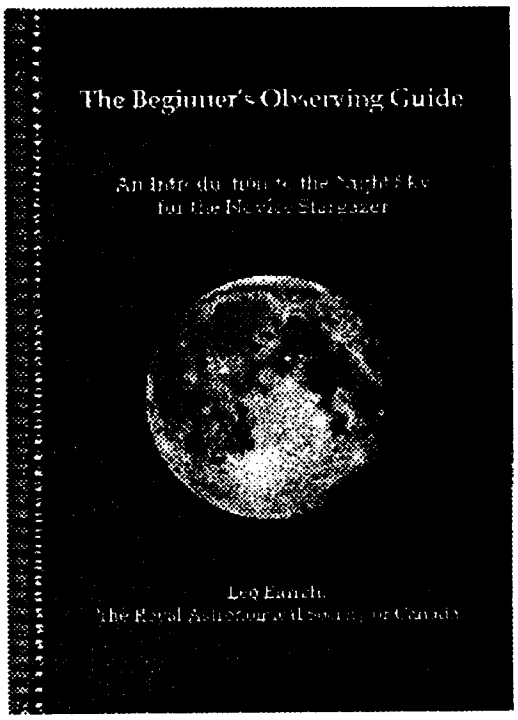
The mirror got some extra work done on it. When it was cored, we found that the original hole had been drilled approximately 1/16-inch off-center from the back. This was due the mirror front and back surfaces nor being coplanar to begin with, causing the hole to be drilled slightly crooked. Bill and I fixed the problem for the most part by spending an evening reaming out the core somewhat to recenter the hole. We originally had decided to grind the mirror flat on the back to fix the "wedging" caused by the non-coplanarity, but decided against if after consulting with Gordon. He suggested we just build a tapering shim to take up the slack in the mirror cell. This we will do.

Work travel commitments stalled Bill and the welder from beginning actual construction of the telescope parts, but with both of these guys back, construction should start the week of April 1st, with the mirror cell being made, followed by the welding of the forks. The final optical path and baffling design is being worked on by Doug Miller. Doug has advised us that providing a Newtonian and Cassegrain design with interchangeable secondary mirrors on the same head will cause us to have an undesireably slow Cassegrain system at f/24. Photographers would find this a pain as the field of view is small and photographic speed slow. We will most likely build this dual design immediately anyway, as the slow f/ratio will be good for planets and CCD cameras (higher magnifications available). This also indicates that we should immediately consider building the second interchangeable head to provide a much more reasonable Cassegrain focus of around f/12 to f/16.

Rick Huziak

1994 RASC Publications for Sale





A limited supply of 1994 RASC Calendars (1) are still available to purchase. These calendars are excellent quality, professionally done and feature super pictures of the sky by Canadian RASC astrophotographers. At only $6.50 each, they are a steal.

The new 1994 *Asteroid Finder Charts* are now available for $5.00 each. These charts, prepared by our our Saskatoon member, Gord Sarty, make asteroid hunting very easy. They are designed to be easy to use at the telescope, being Cerlox bound with a stiff, clear cover. The charts are similar to the Comet Shoemaker-Levy 9 finder chart printed on the last page of last months newsletter.

For deep sky hunters, Rick Huziak has prepared a booklet of observing forms called *My Messier Album*. It is useful for collecting your observations of Messier objects together and is being sold for $1.00.

Finally, the *Beginning Observer's Guides*, 1994 edition (45 copies available) are being sold for $9.50 each. These excellent guides are for the rank beginner or for those who instruct rank beginners. They are packed with loads of information on how to get started and what to see. They are excellent for beginning adults, school-age kids, cubs, guides, brownies, and make excellent presents for up and coming amateurs. Written by a Canadian amateur, Leo Enright, for the Canadian audience. An excellent buy.

You can pick any of these up at the next General Meeting or, if you'd like any of these mailed out to you, please add $2.00 for postage, or I'll deliver them for free anywhere in town, if you give me a call: Rick Huziak, 665-3392. All proceeds go to the Saskatoon Centre.

Astro-Buddies

At the suggestion of member David Cornish, we have initiated an "Astro-buddy" system within the group, in which experienced observers are paired up with novices so that they can learn more about the sky, equipment and other things astronomical. If you wish to be part of this program, either as a beginner or as an educator, please give me a call and we will arrange an astro-buddy for you. My home number is 931-3184.

Sandy Ferguson

Astronomy Day 1994

On Saturday, April 16, 1994, Canadian astronomers, both amateur and professional, will be joining their colleagues in many countries around the world to celebrate International Astronomy Day. This is the 18th year Canadian astronomers will have been part of the festivities and is a day set aside to share with the public our interest in astronomy.

This year our theme for the day is "Astronomy for Children". We will have our display tables set up from 9:00 a.m. to 5:00 p.m. at the Market Mall. We also expect to have Rick Huziak's solar scope set up outside, so that everyone can get a glimpse of the Sun (and hopefully some spots), should the day be fair.

In the evening a starnight is planned (weather permitting, of course) at Diefenbaker Park. We will be set up on the southwest side of the hill, behind the trees, where we hold all our summer starnights. This provides lots of space to set up scopes, as well as adequate parking. Signs will be posted at the entrance to the park and at local intersections.

If anyone is able to donate an hour or two of their time that day to help at our display tables, or to stand watch at the solar scope, your assistance would be greatly appreciated. Also, anyone who can provide time, telescopes and astronomy knowledge will be most welcome at the starnight in Diefenbaker Park in the evening as well.

Please call me at 931-3184 or Rick Huziak at 665-3392 for more information.

Sandy Ferguson

Two New Supernovae

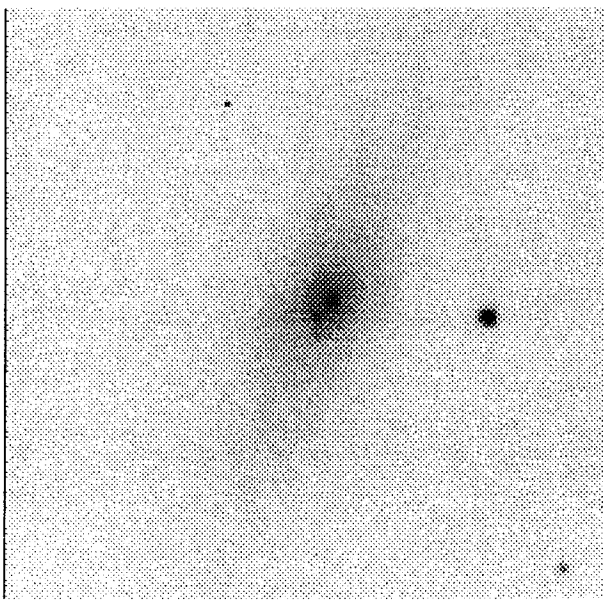
A couple of supernova are presently visible to those with fairly large (at least 8 inch) telescopes and dark skies. They are SN 1994D in NGC 4526, a Virgo cluster galaxy and SN 1994I in M52, the famous whirlpool galaxy.

The picture of SN 1994D on the left shows a 6x6 arcmin field and was taken by Alex Filippenko with the Berkeley Automatic Imaging Telescope, and made available on the internet by Michael Richmond of Princeton University. NGC 4526 is a fairly easy 10th-magnitude galaxy in northern Virgo, located at right ascension 12h 24m, declination 7.7 deg. The supernova is 9 sec west and 7 sec north of its nucleus. It was discovered on March 7 and is presently around 12th magnitude.

SN 1993I in M51 was discovered April 1, 1994 23:00 EST by Jerry Armstrong and Tim Puckett, members of the Atlanta Astronomy club.

The nova is magnitude 13.5, and is located 20 sec east and 5 sec south of the nucleus. It is significant that this supernova is so faint. M51 is a relatively near galaxy, and a supernova in it would be expected to be around magnitude 9. It has been suggested that we are seeing the nova through clouds of M51's interstellar gas and dust. If true, this will provide us with a unique opportunity to "X-Ray" the galaxy.

The image below right is the discovery image and was posted to the internet by the Atlanta Astronomy Club. It is a 1200 second CCD exposure with a 16 inch Newtonian reflector.



Al Hartridge's Asteroid

A member of the Saskatoon Centre, Dr. Al Hartridge, has possibly discovered an earth-crossing asteroid in a photograph taken on March 5 (UT) with a Schmidt camera. Unfortunately, the asteroid image was discovered several days later and bad weather and a bright moon interfered with a confimation photo. Although we reported it to the IAU Bureau for Astronomical Telegrams, this object will remain "lost" without a confirmation.

The image was found on a single exposure through an 8 inch Schmidt camera on hypered Techpan 2415 film. A short asteroid trail appeared near the following (E) edge of the California Nebula (NGC 1499). The image appears sharply delineated (asteroidal, not cometary), though it is immersed within the edge nebulosity of NGC 1499.

The exposure began on 1994, March 5, 04 hrs 45 min UT, ±15 min and ended after a 30 minute (±2 min) exposure. The asteroid appears to be approximately 9th magnitude.

Imprecise coordinates are as follows (direction of motion is indeterminate):
"Beginning": RA 04 hr 05 min 49 sec; Decl.+36 deg 04 min 35 sec
"Ending": RA 04 hr 05 min 44 sec; Decl.+36 deg 05 min 57 sec
(Epoch 2000). Error in measurements may be several minutes from true position in all dimensions, as we do not have the facilities to do precise measurements. The photo was measured by enlarging a copy of the appropriate Uranometria 2000 chart on a photocopier and overlaying it on a print of the photograph. The asteroid appears to have been moving approximately 130 arc-minutes per day.

Gareth Williams, Associate Director, of the IAU has said in reply to our report of Al's discovery, "I can tell you that there was no 9th magnitude minor planet near the position indicated by Dr. Hartridge's photograph on the date stated. If the image is of a genuine object (and not a flaw of some kind), then the object would appear to be new.

"However, we can not give a designation to the object and credit Dr. Hartridge with the discovery as the observations are on only one night and are (at best) approximate. Minor Planet Center rules, endorsed by Commission 20 of the IAU, require precise observations (reported to 0s01 in R.A. and 0″1 in Decl.) on two nights before a designation can be assigned immediately. (We do have a mechanism for designating so-called 'one-night stands', but these do not receive designations for more than 12 months, and still require precise positions.)

"The daily motion of 65′ could be indicative of a Hungaria- or Phocaea-type object, or possibly something more exotic, but without precise measurements and a second night, we will never know for sure." [The motion was actually closer to 130′ per day as mentioned above.]

When photographed on Mar 5, 04:45 UT, the asteroid was moving in an approximate PA of 15 degrees or PA 195 degrees at the rate of 130 arcminutes per day. Since the object seems to be an earth crosser, simply multiplying the daily movement by the number of elapsed days is not sufficent to calculate where the asteroid would be X-days after the photo, and it is likely that projected line of sight velocities varied widely before or after the photo. As such, we are interested in obtaining images anywhere along the stated position angles from the the original image taken within hours, days or weeks of Mar 5.

Rick Huziak has sent e-mail to many people in hope of finding another photograph of the asteroid but we've not had any replies. I have also sent a print of Al's photo to Dr. Tatum at the University of Victora for more precise measurments and so that he can see that the asteroid is not a photographic flaw.

Ida's Moon

(The following are exerpts from an article posted to the internet by Ron Baalke of JPL on March 23, 1994.)

The first-ever photograph of a moon of an asteroid, sent to Earth by NASA's Galileo spacecraft, was released on March 23. The photo, of asteroid 243 Ida and its newly discovered natural satellite, was taken by Galileo as the spacecraft flew past Ida last August 28. It was not transmitted to Earth until recently because the spacecraft is sending back data at a very slow rate.

According to team scientists at NASA's Jet Propulsion Laboratory, the image together with data from Galileo's near-infrared mapping spectrometer are the first conclusive evidence that natural satellites of asteroids exist.

From the photo and spectrometer data, team scientists estimate that the natural satellite is about 1.5 kilometer (1 mile) across in this view, and appears to be at a distance of about 100 kilometers (60 miles), plus or minus 50 kilometers (30 miles), from Ida's center. The position will be more accurately determined as new data are analyzed. Ida itself is about 56 by 24 by 21 kilometers (35 by 15 by 13 miles) in size.

As yet they do not know the parameters of the object's orbit – critical information that can reveal Ida's mass. Combined with measurements of Ida's size and volume, that can tell scientists the asteroid's density, offering more clues as to what it is made of.

Ida is a member of the Koronis family of asteroids, which scientists believe was created when a larger body perhaps 200 to 300 kilometers (120 to 180 miles) in diameter was smashed relatively recently – at least considerably after the solar system formed some 4.5 billion years ago. (The family was named for Koronis, one of the asteroids that belongs to it.)

Alternatively, it is possible that Ida was hit by a smaller object even more recently, leaving a crater on the asteroid and throwing off the material that became the small moon.

Galileo scientists also believe it is virtually impossible that the moon is a "captured object", something created completely separately from Ida that happened to wander near the asteroid and be caught by its gravitational field. According to the laws of celestial mechanics, such an event would deflect the smaller object, but it would not be captured into orbit unless a third force of some kind slowed it down.

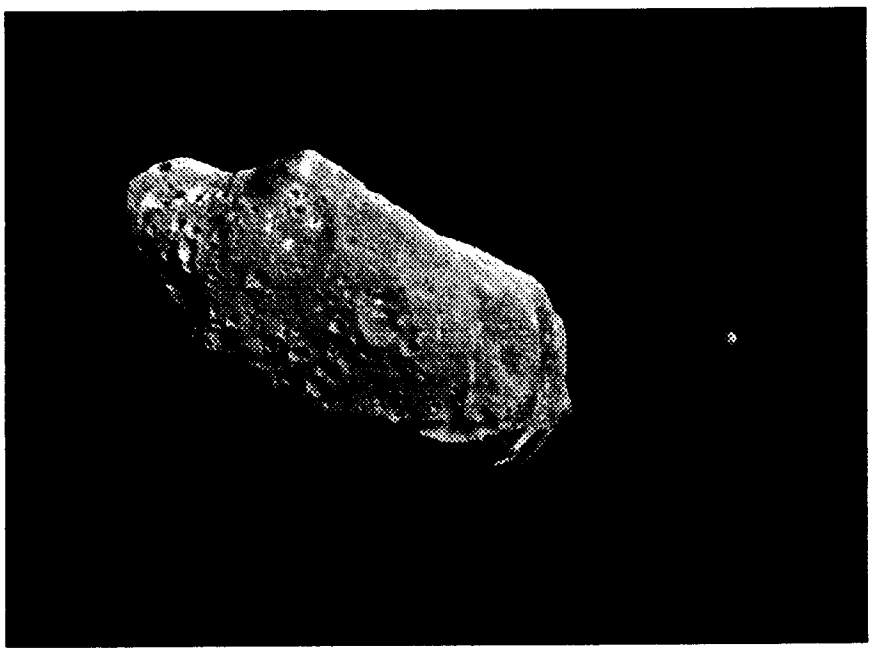
"Once we have determined the object's orbit, we can estimate time scales and make better guesses as to where it came from", said team scientist Johnson.

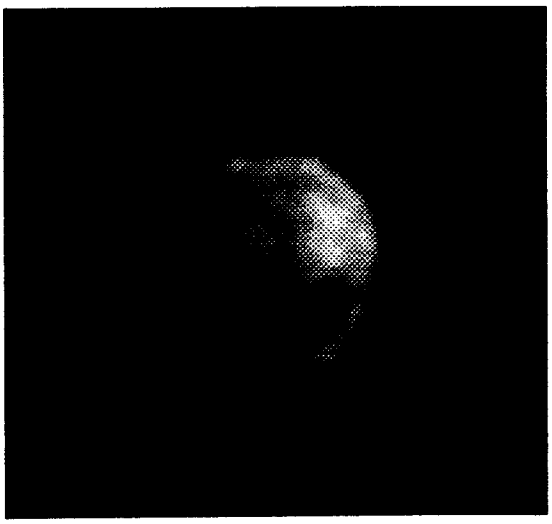
Scientists say that the newly found moon was outside the boundaries of the picture of Ida released last September.

Amateur astronomers for many years have observed the light of stars blinking off and on as objects such as asteroids pass in front of them in events called stellar occultations. Some have reported "blinkouts" that suggest that some asteroids have moons, but such reports have never been confirmed by definite second sightings. Galileo's discovery is thus the first unambiguous evidence of an asteroid moon.

Other images that may show the asteroid moon are still stored on Galileo's tape recorder, and will be played back later this spring. Among them is an image that is expected to be at least three times sharper than the first image received.

The newly found moon has been provisionally designated "1993 (243) 1"; meaning that it is the first natural satellite discovered in 1993 at Ida, which was the 243rd asteroid discovered over the past two centuries. The moon will be formally named later by the International Astronomical Union.





First 3-D Model of an Asteroid Created

(The following are exerpts from the "JPL Universe", March 11, 1994, which was posted to the internet by Ron Baalke of JPL.)

A JPL senior research scientist and his NASA-sponsored collaborator have produced the first-ever detailed three-dimensional reconstruction of one of our solar system's thousands of asteroids whose orbits bring them extremely near to Earth.

Dr. Steven Ostro of the Geology and Planetology Section 326, along with Dr. Scott Hudson of Washington State University in Pullman, Wash., created the computer model of the double-lobed asteroid 4769 Castalia using radar data obtained in 1989 by Ostro and others from the Arecibo Observatory in Puerto Rico.

The asteroid was discovered by astronomer Eleanor Helin of Section 326, at the Palomar Observatory in 1989. Ostro and Hudson's computer model and the resulting pictures appeared in the Feb. 18 issue of *Science* magazine. The effective resolution in this reconstruction is about 100 meters (330 feet).

At a little less than two kilometers across (about a mile), Castalia is smaller than any solar system object for which spacecraft images have been taken–including the two asteroids, Gaspra and Ida, recently imaged by NASA's Galileo spacecraft.

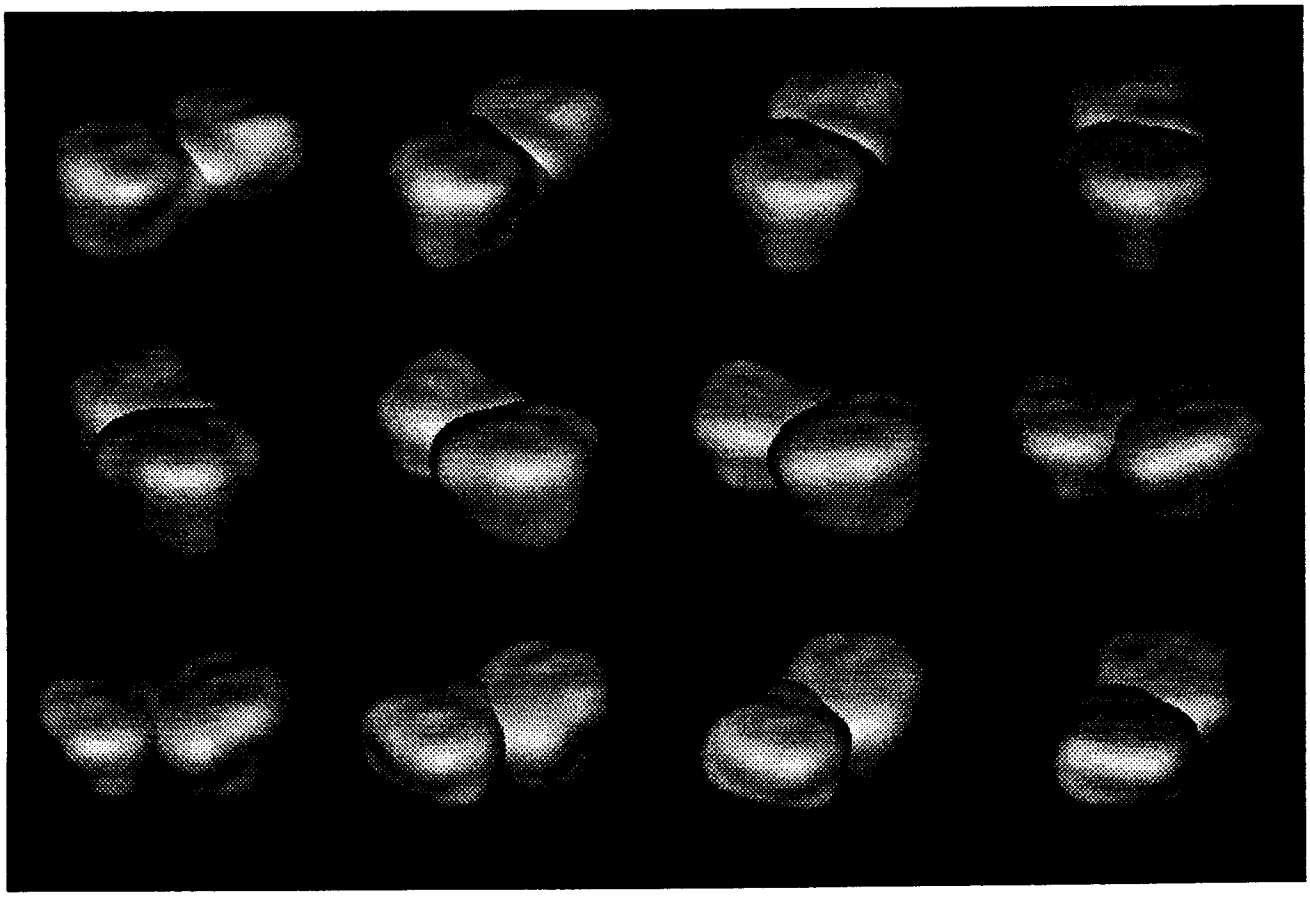
Ostro said that previously it was very difficult to interpret radar images of small, irregularly shaped bodies. But with the development of this new reconstruction technique, the scientific value of radar observations has been dramatically enhanced.

Nearly 300 near-Earth asteroids are currently known. It is thought that more than a thousand as large as Castalia, plus 100 million as large as a house, remain to be discovered. Most of them are thought to have been thrown into the inner solar system from the main asteroid belt between Mars and Jupiter because of long periods of gravitational interaction with the planets.

With unstable orbits, these asteroids might eventually be thrown out of the solar system by the same forces, or possibly collide with planets.

The scientists believe that continuing improvements in radar telescopes, expanded optical programs to search for near-Earth asteroids and modeling techniques like this one will provide greatly increased knowledge of the properties and histories of these strange nearby worlds.

The research was part of the Innovative Research Program, the Planetary Geology and Geophysics Program and the Planetary Astronomy Program of NASA's Office of Space Science, Washington, D.C.



Subscribing to Sky and Telescope for Less

Sky and Telescope magazine offers a discount subscription rate for any member of an astronomy club if that club and affected members are registered with them. The Saskatoon Centre has recently taken S&T up on the offer and we have registered the Centre. New subscribers or members with current subscriptions both qualify for the deal. Cut rates for current subscribers will come into effect upon their next subscription renewal. Hopefully, by the time you read this, I will already have registered you for the program. If I have not, or you want to be added to register, please phone me. You can register to become a member of the plan at any time in the future. In order to participate in the program (and NOT drive Mike Williams crazy with renewals), a few rules will have to be followed. Please observe these rules to ensure your subscription does not lapse.

1. Reduced rates are available on one-year subscriptions only. Regular cost is $36.38 USD. DISCOUNTED rate is $29.96 USD. Payment can be made by an International Money Order, VISA or MasterCard. Make money orders payable to "Sky Publishing Corporation" in US dollars. (Note that GST is already included in the above prices. You do not have to add it).

2. All payments for first-time subscriptions AND renewals MUST go through our Centre's Treasurer, Mike Williams. Mike will accumulate members' forms and send them with payment to S&T as required (monthly if necessary).

3. If you are a first time subscriber, send a subscription card (or just your name and address) AND payment for the discounted amount for the first year, directly to Mike Williams, PO Box 130, Grandora, SK, S0K 1V0 (or bring it to the next General Meeting). If you are charging via credit card, include the credit card type, credit card number and expiry date.

4. If you already have a subscription, wait for your next renewal notice, whenever it may be, which will arrive directly from S&T as normal. Then send the completed renewal notice with a money order for the discounted amount to Mike Williams, PO Box 130, Grandora, SK, S0K 1V0 (or bring it to the next General Meeting). If you are charging via credit card, include the credit card type, credit card number and expiry date. Repeat this process yearly.

5. DO NOT subscribe or renew directly with Sky and Telescope. You will either receive a second subscription by accident, or the order will be outright rejected.

OTHER DISCOUNTS:

Note that if you are registered for a subscription discount, YOU CAN ALSO RECEIVE A 10% DISCOUNT ON ALL OTHER MATERIALS PUBLISHED BY SKY PUBLISHING CORPORATION. These materials, listed in their catalog or magazine, do NOT have to be purchased through the Centre (and we'd prefer it you didn't). When ordering, all you have to do is mention on the order form that you are a member of the Saskatoon Centre and that you are registered for the "Astronomy Club Discount Plan" price. S&T will confirm this at their end. Submit 10% less funds for the base-cost of the item (then add taxes, shipping etc.), or give them your credit card number and let them figure out the details.

If you have any questions about the Plan, please feel free to contact me at 665-3392 or 933-1676, or contact Mike at 668-4365.

Rick Huziak

Cover Photo - Al's Asteroid

This months front cover shows what may possibly be the only photo ever to be taken of an asteroid that came very close to the Earth. The photo was taken by Saskatoon member Al Hartridge on March 5, 1994. The asteroid is the streak pointed to by the arrow. For more on this story, see the article on page 6.

For the record, the dinosaurs on last months newsletter were drawn by Michael Rothman.

Saskatoon Skies Information

Commercial vendors wishing to advertise in the "Saskatoon Skies" may do so at the following rates: $50.00 per page, $25.00 per half page and $12.50 for business card ads. Individual RASC members and other parties (at our discretion) may advertise items and events for free.

Next months deadline is Friday, April 29, 1994. Please have any submissions in to me by then in order to be included in the next issue. Submissions may be in typewritten form or on a floppy diskette (3.5 or 5 inch size and formatted for MSDOS) preferably as ASCII files. Electronic submissions are preferred as it saves me some typing. Mail or bring your submissions to:

Gordon Sarty
422 Edmund Park,
Saskatoon, Sask.
S7H 0Z4
phone: 374-8803

OR

Saskatoon Centre RASC
Box 317, RPO University
Saskatoon, Sask.
S7N 4J8

E-mail submissions to sarty@math.usask will also be accepted. Saskatoon Skies is a monthly publication of the Saskatoon Centre of the Royal Astronomical Society of Canada.

Comet McNaught-Russell 1993v

Below is a chart showing the path of Comet McNaught-Russell which is currently visible in Saskatoon skies. It should be visible in binoculars under very good skies, being at approximately 7th magnitude. More detailed finder charts have been placed in the Rystrom observatory. Phone the editor if you would like copies of these more detailed charts.