Saskatoon Skies

Volume 22, Number 2 February, 1992

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Saskatoon Skies Information

Next month's deadline is Friday, February 28, 1992. Please have any submissions in to me by then in order to be included in the next issue. Saskatoon Skies is a monthly publication of the Saskatoon Centre of the Royal Astronomical Society of Canada. Submissions may be sent to one of the following:

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S7J 3C2
373–0137 (home)
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Submissions mailed to the Centre's address may not be retrieved in time for inclusion unless you tell me it's there.

Minutes of the General Meeting
Meeting Room 2, Francis Morrison Library
January 8, 1992

Item	Detail	Action
63.	Meeting called to order at 7:40 PM.	R. Huziak
64.	R. Huziak provided a short description of the RASC for the non–members present.	R. Huziak
65.	R. Huziak welcomed Sandy Ferguson, a former Ottawa Centre member, to Saskatoon.	R. Huziak
66.	R. Huziak stated that the February meeting would feature a lecture by E. Kennedy about the "Moon Hoax".	R. Huziak
67.	The next Observer's Group meeting will be at the Rystrum Ob–servatory on Saturday, February 1, 1992, 7:30 PM.	R. Huziak
68.	An upcoming occultation of a star by the asteroid Eunomia was discussed. R. Huziak and M. Wesolowski are encouraging members in Saskatoon and elsewhere to observe this event and to send these observations to them for forwarding to the International Occultation Timing Association. Information appears in the January newsletter	R. Huziak
69.	The next General Assembly will be in Calgary from July 1–5. Information is available in the newsletter and registration forms are available from Mike Wesolowski.	R. Huziak
70.	Damien Lemay, National President of the RASC, presented an illustrated talk entitled "Astronomy: A Hobby and a Science".	D. Lemay

NOTICE OF GENERAL MEETING

The next General Meeting will be held on Monday, February 17, 1992, at 8:00 P.M. in Room B–111 of the Health Sciences Building. The guest speaker will be Professor Emeritus J.E. Kennedy, who will present a talk about the "Moon Hoax". The talk deals with a series of articles appearing in 1835 in a New York newspaper, *The Sun*, which provided detailed telescopic observations of the Moon. Based upon observations emanating from a southern hemisphere observatory, it was alleged that the Moon was indeed inhabited. These accounts were collated and published as a 20 page pamphlet by *The Sun* and subsequently translated into several languages. Sound interesting?

NOTICE OF OBSERVER'S GROUP MEETING

At the time of writing (early February) the date for the next meeting has not been set. There was a meeting on Saturday, February 1. Since last quarter is on February 25, I will speculate that the next Observer's Group meeting will likely be on Saturday, February 29. This date will be set at the next General Meeting. If you are interested in attending, contact me (the editor) prior to this date and I will let you know for sure what's going on.

EDITOR'S NOTES

1) There was no executive meeting in January, so there are no minutes for an executive meeting to be published. Hopefully it will be refreshing to read a newsletter that doesn't seem to consist of meeting minutes only.

2) Those of you who keep track of such things are probably aware that the robot probe Galileo, en route to Jupiter (via Venus and the Earth) made a close flyby of the asteroid Gaspra late last October. Passing less than 1600 km away, numerous pictures were taken, of which one has been reprinted in both *Astronomy* and *Sky and Telescope* magazine (that I know of). The February issue of both magazines provides a brief article discussing what was learned during the flyby. Again, for those who follow this, Galileo's main communication antenna is still stuck in a partially open position (as of January 29). The data used to create the image used by the magazines was received at a rate of 40 *bits* per second using a smaller auxiliary antenna. Efforts continue to persuade the main antenna to open fully.

3) Observers take note! Jupiter is at opposition this month and since it will be rising at sunset, it means that we don't have to stay up late to see it. For new members, this means that, as seen from above the solar system, Jupiter and the Sun are separated by 180 degrees as seen from the Earth. Because of its size, Jupiter shows up well even in a small telescope. Jupiter was one of the first objects I ever looked at with a telescope (a 40mm refractor with a 15x–30x–45x zoom and tabletop tripod) and even with this small instrument, I could see belts and the four Galilean moons. New members are especially encouraged to have a look. Jupiter will be the brightest "star" in the sky. I especially don't want to hear that it's too cold!

4) The February issue of *Sky and Telescope* discusses the 1991 Perseid meteor shower and suggests that the activity is picking up. This does not appear to jibe with the observations made here in Saskatoon. Perhaps the aurora and cloud affected our observations...

5) One of the more surprising discoveries in the last little while is the apparent discovery of ice on the planet *Mercury*! It may seem counterintuitive to suggest that an environment with surface temperatures hot enough to melt lead could also have water ice, but that is what is being postulated to be the case for Mercury's north and south poles. Recent radar observations of the planet revealed that the north rotational pole of Mercury has a radar echo which resembles that expected from water ice, similar to what is observed on Mars from it's poles. It is suggested that the ice appears in shaded areas, "where the sun don't shine", so to speak. Details in the January issue of *Sky and Telescope*.

GENERAL ASSEMBLY REMINDER

The next General Assembly of the Royal Astronomical Society of Canada will be in Calgary, Alberta, from July 1–5, 1992. For information, refer to the January issue of *Saskatoon Skies*, or contact RASC– Calgary Centre, c/o Ms. Dennis Goodman, 28 Southland Crescent S.W., Calgary, Alberta, Canada, T2W 0K3. Phone (403) 252–7095. Information is also available from the editor.

THE JANUARY 17 EUNOMIA OCCULTATION

Mike Wesolowski
Richard Huziak

As discussed in the January issue of *Saskatoon Skies*, the asteroid 15 Eunomia was predicted to occult a 9th magnitude star in Hydra, with the shadow passing over Saskatchewan. This provided observers in Saskatoon with the opportunity to assist in the attempt to derive the size and shape of the asteroid by timing the start and end of the occultation.

The authors of this article rose to the challenge, using an equipment setup that had worked in a similar attempt a year earlier: a shortwave radio, tape recorder and receivers for nursery monitors in the warmup shelter, with the transmitters for the monitors kept by the telescopes being used.

A number of challenges faced us. Freezing rain 36 hours before made it difficult to get into the Rystrum Observatory. In spite of the weather office's assertion that at 4 A.M. the skies were clear, the nearly full moon was clearly embedded in light cloud while driving to the observatory at 5 A.M. The temperature was –23 C (warmer than predicted, at least!). Rick had the doorknob for the cold storage shelter come off in his hand. There was *frost* on the eyepiece of the finder scope for the Celestron. The radio would not give us a clear signal while attempting to tune to the proper frequency for time signals. The dome was *extremely* stiff (anyone who thinks that their car has trouble turning over at these temperatures should try moving the dome!). Finally, based upon a call the night before to the occultation "hotline", the new predicted track for the occultation had shifted into Alberta.

The skies did clear up by the time we were ready to start looking for the star. Knowing the predicted altitude of the star (a maximum of 13 degrees above the horizon) did not prepare one of us (MW) for how low the star really was. Some difficulty was encountered, mostly due to the lack of dark adaptation, but the star was found in plenty of time by both authors (using separate telescopes). The star was monitored more–or–less continuously from about 6:10 A.M. to 6:30 A.M. and no occultations were observed (astronomers are interested in observations surrounding the predicted time because of the possibility, hinted at in previously observed occultations of other asteroids, that satellites might orbit a main asteroid body). While we did not enjoy the excitement of observing a real occultation, our observations are still valuable as they establish where the asteroid, and any satellites it might have, were not.

We would like to attempt this again in the future. Both *Sky and Telescope* magazine and the *Observer's Handbook 1992* list asteroid occultations for the year, and while none of the predicted shadow paths cross Saskatchewan, it would still be worthwhile to observe those that are predicted to be visible from North America if only to contribute the negative observations. If nothing else, the weather conditions are likely to be less extreme in the future.

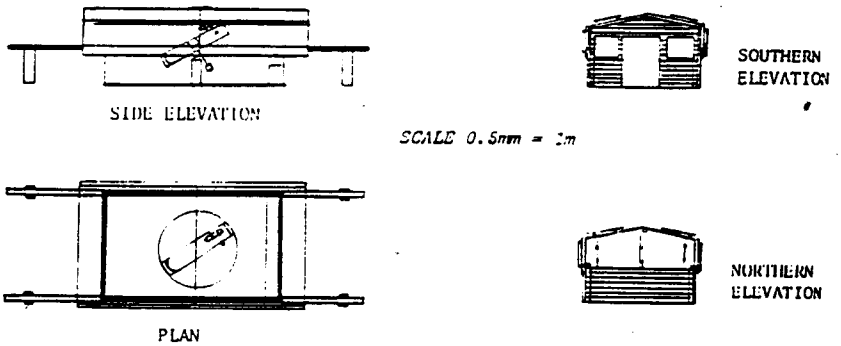
If you are interested in asteroid occultations, you can contact either of the authors for more information.

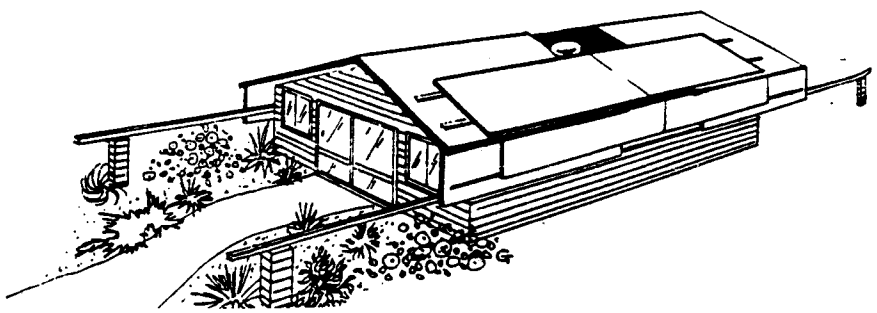
Building an Observatory

After several years of studying observatory design it has become apparent that the dual motion, split roll off roof design offers many advantages. It provides greater protection than conventional dome designs. The roof can open above the telescope to create a variable width slit. By moving both sections of the roof, the slit can be moved to the north or south, east or west of the zenith depending on which direction the main walls point to, and exposure to wind and cold are reduced.

It is important that the observatory be built in such a way that the two main walls run due north, south, east or west depending again on preference, to allow the slit to open at right angles. This allows the observer to track an object for a long time without moving the slit. Conventional domes must be moved often. This is most useful to the observer who often wishes to look around the sky when hopping from one object to another.

On cold nights, when temperatures are sub-zero, the slit may be opened a little more than the aperture and size of the telescope. On warm evenings you can roll the roof back entirely, exposing large areas of the sky. This is useful in taking wide angle photographs.



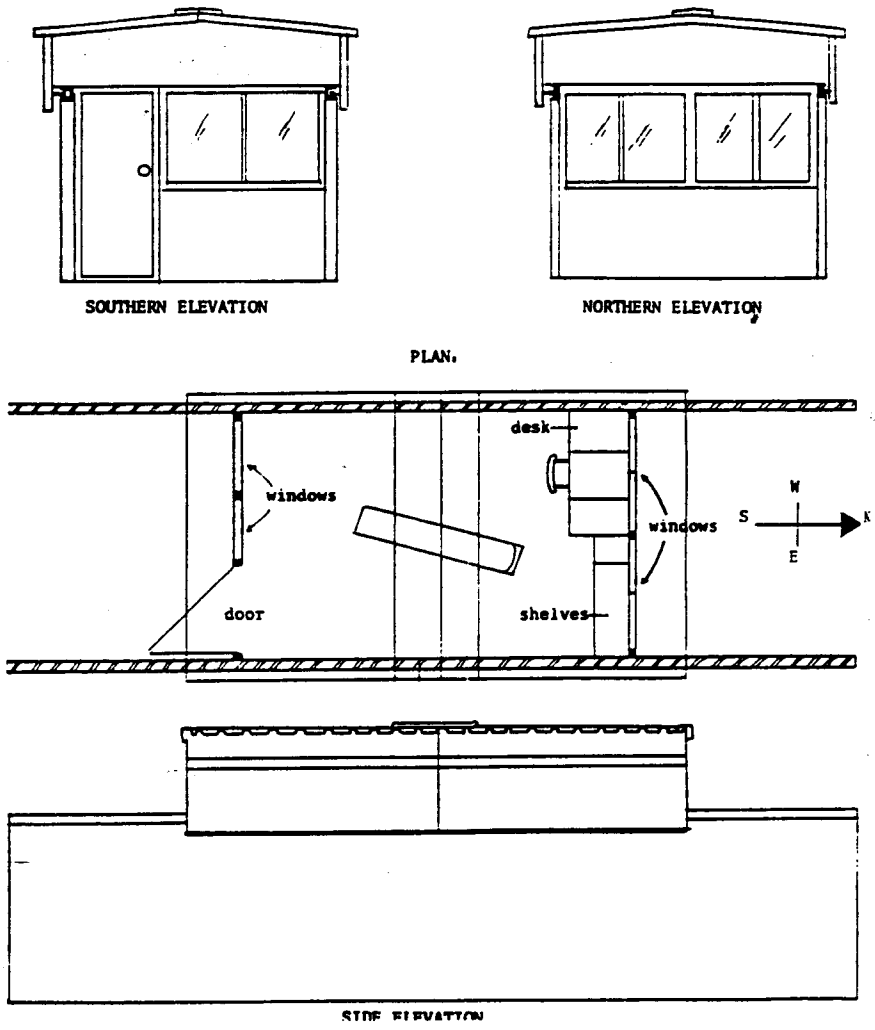


If the observatory is to be used for public star nights, it is convenient to open the slit wide enough to point out whole constellations to groups of visitors standing in different areas of the observing floor. The split roll off roof design can also accommodate more than one telescope if needed.

The construction of the roof and walls of a simple split roof observatory is far easier than an observatory dome and it is also easier for the observer to build who has little experience in construction. Proper operation of a split-roof requires only that the tracks be parallel and level. If the rollers are placed at one third the length of each roof from the ends it will allow the roof to roll well beyond the edge of the track increasing the opening to the sky for when a number of telescope are to be used. For sites where wind is a problem attach sliding doors to the wall of the roof section. Doors reduce crosswinds that can

vibrate a telescope. Light weight doors made of pine, galvanized metal,or aluminum are best. They need only to be supported by a simple smaller track at the top and a guide track on the bottom. This prevents them from flopping in the wind. The doors need to be opened only to view low along the horizon.

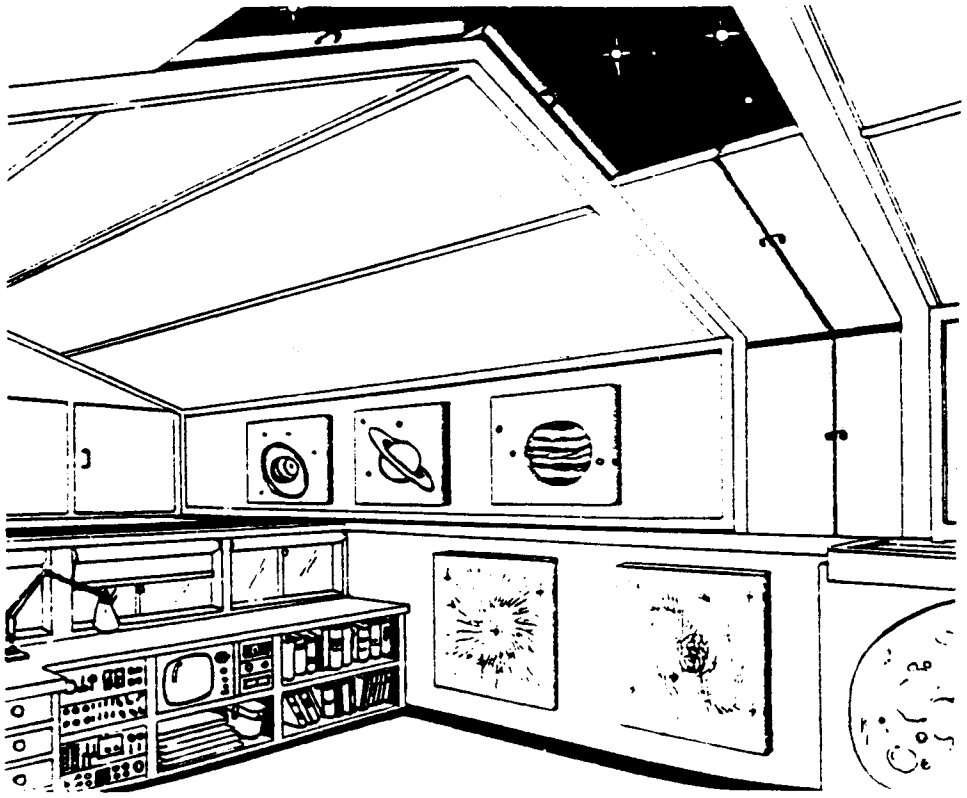
Because 'seeing' can be affected by differences in temperature between the observatory and the surrounding air temperature you should make exterior walls out of material that does not retain heat. Aluminum sheeting and wood cool rapidly as darkness falls but brick does not. Painting of exterior white will reduce the heat absorbed through the day. A large overhang on each roof or planting some leafy shrubs can shade the walls from the Sun's heat. The end walls support the roof and therefore need to be of sturdy construction. In suburban sites, skies do not permit views much below 15 to 20 degrees above the horizon, in which case the walls can be 2 to 2.5 meters high permitting normal doors and windows to be built into any of the walls.



Supports for the ends of the tracks need only be simple pillars. You might consider using these supports to create pleasing enclosures using plants or flower beds between the tracks. This area may also be used as a green house or garden shed to help justify your building costs. The observatory floor may be either concrete or timber. You might also cover the floor with vinyl tiles or indoor-outdoor carpet. Mount the telescope independently of the floor. A very important aspect of any interior is often the most neglected. Observatories are not only used at night but also in the daytime. This requires plenty of light inside the observatory. If the observatory is to be used as a study, then windows can be installed into the design to provide good natural lighting and

ventilation. Windows may require shutters, heavy blinds or curtains if it is necessary to block out unwanted light when observing. An incandescent, long reach, draftsmans desk lamp is a necessity at the work bench. It should have a clip-on red filter or interchangeable red bulb. This type of desk lamp is most useful for controlling the degree and duration of illumination on small items, such as star charts, eyepieces, books or astrophoto equipment without allowing the light source to shine directly into your eye.

Because many astronomical observations require the observer to detect faint objects it is important that the observatory be as dark as possible and have faint light only where it is needed like work centers, desks, observing chair, setting circles and instrument panels. It is far better to have a number of faint lights than one brighter one. I find that a child's night light correctly shielded around the edges and plugged into an extension cord makes an excellent hand-held low intensity light source. Some general red lighting is useful if the observatory is likely to have visitors. This allows the movement of people with less risk of injury without turning on white lights ruining your dark adapted vision.It is best to hide the light source and control the red lights with a dimmer switch.



Be sure to allow for plenty of desk space. Star charts take up a lot of room. Even large desks are always too small in a well used study. The convenience of having things where you want

them will pay for itself many times over. Provide adequate storage areas for all equipment you will keep in the observatory, otherwise it will become and obstacle. Don't skimp on bookshelves, if you are serious about astronomy they will fill rapidly. Have interior walls, ceilings and floors rather dark, This will greatly reduce unwanted reflections. Even the faint light of the night sky is enough to desensitize the fully dark adapted eye. Paint the walls and floor with a flat black enamel paint. You may want to sprinkle white paint (stars) over the flat black to make it more interesting. It might be wise to allow for a bed in your floor plan. Visitors also find it a welcome seat while waiting their turn to look through the eyepiece.

The joint in the roof is simple to water proof. It requires only that some template be attached on one roof section so that it overlaps two ridges of the other roof section when the observatory roof is closed. The sides of the roof should be extended ten to fifteen centimeters below the level of the track unit. A foam strip can be glued onto the wall below the tracks in high wind areas. This also prevents drafts and moisture from flowing under the overhang.

It is vital to consider the thermal effects that your surroundings may have on your observing conditions. Hot air rising out or the observatory slit is the most common problem. A split roll off roof has the option of rolling the roofs apart after sunset quickly dissipating warm air that may have accumulated inside the observatory during the day.

Another thermal problem is cause by heat rising from the human body. The simplest way to avoid this is to fit a light weight tube one meter long over the open end of the telescope if possible. The warm air rises around the outside of the tube rather than through the optical path which can affect 'seeing'. If you are working with a limited budget you can still build a split roll off roof observatory for as little as $200.00 Canadian.

A large version of this design would prove to be a practical and cost effective club observatory. It can also accommodate more than one or two telescopes at club star parties. This next generation of observatories no longer will use domes to house their instruments and telescopes and the amateur astronomer might consider the practical aspects of the split roll-off roof design.

Submitted by
Center President For 1992
Don Friesen.