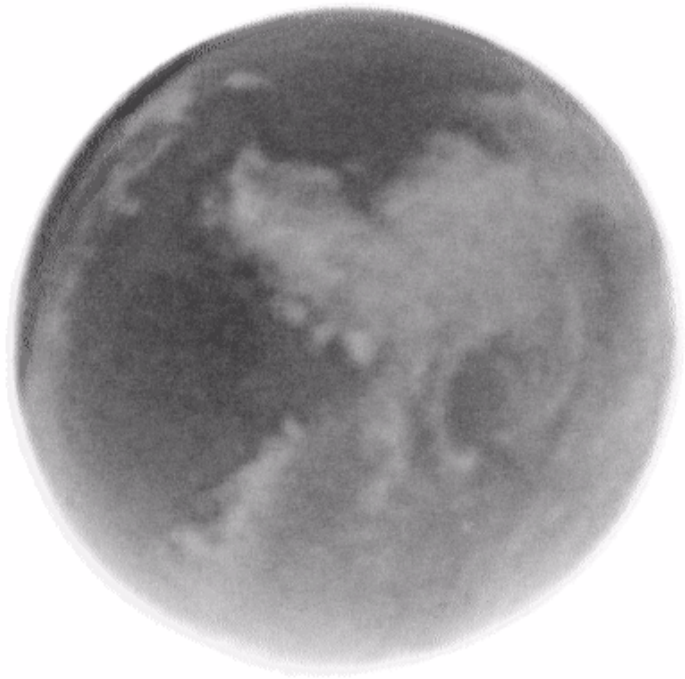
PRINTED MATTER

ORBIT
Hamilton Centre RASC
BOX 1223
Waterdown, ON L0R 2H0

To:

ORBIT

September 1996
Vol. 29, Issue 8



Mars: The Red Planet
Life is Confirmed on Another World

The Official Publication of the Hamilton Centre of

Cover Image - Mars image from NASA, Modified for Reproduction Clarity

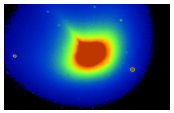
ORIAL

Summer finally arrived several weeks ago, and we have had spectacular seeing on many nights over the previous weeks. Besides editting our newsletter, I have gotten out to do some observing on several occassions, at the observatory, local conservation areas, and my front yard. I will tell you the weirdest stuff happens in your front yard, of all three! But our beloved observatory is not immune either, and a report on an attempted break-in is included in this issue. Jupiter, the moon, and Saturn are all very easy targets this month, no matter where you are, even with tall trees at the observatory. Bob Botts has provided a planet viewing report for your pleasure. Michael Jefferson brings us thoughts on Starfest, and Roger Hill muses on the recent Martian discoveries. Mars is also visible for early risers, and Neptune and Uranus provide a nice colour contrast in the evening. Les Nagy pointed me to finding Uranus in my 6" Dob-a-torial, which just goes to show, anyone can find these celestial gems. The end of this month marks the conclusion of this membership year, so its time to volunteer for the new board, and get active in working on next year's projects. Armchair Astronomers and Observational types can look forward to all kinds of excitement this year. Please pay particular attention to the New Membership information, the special privileges, and nominate some board members!

Clear Skies! ☆

Colin A. Haig

CONTENTS: THIS MONTH



HAMILTON CENTRE INFO & OBSERVATORY

From Hamilton or Guelph:

- Hwy 6 north of Hamilton, take Concession 7 East.
- Proceed eastbound on 7E, cross Centre Rd.
- Continue on 7E, keep going past the rail tracks
- proceed nearly to the end.
- Our gate is on the south side on the last lot (south west).

From Mississauga or Milton:

- Brittania Road past Hwy 25, Guelph Line, Cedar Springs to end
- South 1 block on Milborough TownLine to Concession 7 East.
- Our gate is on the south side on the last lot (south west).

NAME	Phone	Email Address
Observatory	689-0266	http://ad-here.com/RASC/
Astronomy emailing list	subscribe	bigbang@ad-here.com
President: Roger Hill	878-5185	roger@ad-here.com Fax: (905)878-3974
Secretary: Dave Coulson	634-4436	
Treasurer: John Kezys	648-5542	kezys@operatns.mohawkc.on.ca
Education: Carmen Martino	643-7283	
Observing: Rich Petrone	547-2589	petrone@ physun.physics.mcmaster.ca
Curator: Les Nagy	387-0690	lnagy@netaccess.on.ca
National:Mike Jefferson	648-8919	
General:Charles Baetsen	524-0148	charlesb@abelcomputers.com
Librarian/Recorder: Ray Badgerow	692-4184	s296489@ liberty.mohawkc.on.ca
Editor: Colin Haig	577-4074	chaig@vizbiz.com

WHAT'S HAPPENING!

Monthly Meetings are held by the Hamilton Centre at McMaster University Medical Centre Ewart Angus 1A6 8pm. We meet on:

Thurs. Sept 5, 1996- 8pm: Hamilton Centre regular meeting. Summer Vacation fun! New members always welcome! Write this on your calendar! Bring your slides and stories!

Friday, Sept 13 -7:30pm - HAA General Meeting. Speaker will be Ian MacGregor of Royal Ontario Museum; topic Mayan Astronomy; Spectator Building

Saturday, Sept. 14 - Car Wash at Canadian Tire, Mohawk and Upper James. 8:30am to 4:30pm. Special Fund Raising! We need 8 people! Contact: John Kezys 648-5542.

Sept 17 - 8:00 pm: Hamilton Amateur Junior Astronomers meeting at B148 at Burke Science building, McMaster University

Sept 26 - prepare thyself for tonight's lunar eclipse!

Sept 28 - 8:00 pm Hamilton Centre new member tour of the observatory.

Sept. 28 - 8:00 pm HAA Cosmology Discussion Group. room B148, BSB, McMaster University

Oct 3 - 8:00 pm: Hamilton Centre Annual General Meeting, Speaker Richard Petrone, McMaster Medical Centre, room 1A6

Oct 5 - 8:00 pm First meeting of the Galileo Study Group, at the observatory, call John Kezys at 648-5542

Oct 11 - 7:30 pm: HAA General Meeting; Spectator Building

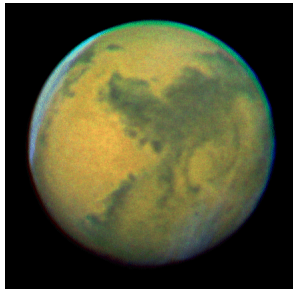
Oct 19 - 7:30 pm: Scheduled CCD imaging meeting, at the Observatory, call John Kezys at 648-5542. Anyone interested in CCD Camera is welcome!

Can you help? We need: tree removal ,lawnmower repairs, paint for buildings, new door and frame for Marsh, eyepieces, picnic table

FROM THE KEYBOARD OF THE PRESIDENT

Ahhh, September! The nights are getting longer, and some of the best viewing starts. Stay up late enough, and the early winter stars appear, while the late summer skies are still visible early on. The temperatures are still warm, even if the air seems more than a little damp. For viewing, this is my favourite time of year. Starfest is but a memory, yet it always seems to invigorate me to get out and observe. I could talk about all sorts of things this month, but I will concern myself mainly with just one topic: The possibility of Life On Mars.

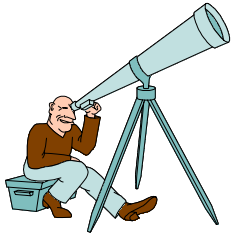
For as far back as I can remember, I have been fascinated by the Red Planet. During the early '60's when I was in primary school in Liverpool, I had a teacher who had a copy of an old book on Mars by Percival Lowell. I devoured that book, and (along with the American space program), it may have been the catalyst that ignited my interest in Astronomy to the levels of a passion. Not a bad return on that teachers investment. I desperately wanted to see canals, and the growing green tide of life spreading across the planet as water was pumped down from the poles. Then, reality struck.



Mariner 4 returned the first close up pictures of Mars. My initial devastation at learning that now the canals were consigned to the garbage heap of history, quickly led me to see that there were things out there that no-one suspected. All things were not known, and humanities quest for knowledge went on. I was amazed at how scientists managed to get the density of Mars atmosphere simply by watching what happened to the radio signal as Mariner 4 passed behind the planet. Yet I still insisted that my parents take me to see a really exciting movie called "Robinson Crusoe on Mars." Well, I thought it was exciting. I saw it again a couple of years ago, and marveled at my parents patience. Not once did they begrudge dragging the family out to see a not very good movie. I can only think that maybe, just maybe, my Dad also wanted to see it! When we moved to Northern Ireland (for 18 months), we saw another bad movie: A Crack in the World. We have since watched a number of so called Sci-Fi movies together.

When I first got my telescope (a little 4 inch reflector that I still have - it

needs a new coat of aluminum, Les) my Dad would not let me take it out until I learned a little bit more about astronomy. So, off we trouped to a bookstore in Liverpool and I bought two books. One I bought because it had a really great picture of Mars in it, and a graphical table of solar eclipses visible in the UK until 2000 AD I took the books home, and since I could not take the telescope outside, I set it up at one end of the hall, with the book at the other and looked at that Mars picture for hours.



It was a while before I actually found Mars in the night sky, and when I finally did, wow, what a disappointment. It was a small, reddish, round dot. No hints of polar caps, so little detail, and certainly, nothing that looked like canals. Although my Father would occasionally indulge my astronomy interest, it did not include a move to Flagstaff, Arizona. We moved to Southern Ontario, instead. At least Mars was almost ten degrees higher in the sky.

A number of apparitions of Mars have come and gone along with a flotilla of planetary probes. Each has brought exciting results, at times they totally contradicted the 'current' wisdom. There was a time when we believed that Mars had no high mountains, or deep valleys, because the only features we could see were albedo features, not topographic ones. It was quite a shock to learn that Mars was host to the largest shield volcanoes in the solar system, and (most likely), it largest canyon. It took an orbiter to give us our first views of Valles Marinaris and Olympus Mons. And it took a lander to show that the skies of Mars are not blue, but pink! These craft not only revolutionized our view of Mars, but also helped to make us realize that Mars was a place, not a light in the sky.

Then came the announcement last month that a rock had been found with features in it that were most likely formed by primitive life. After the intense disappointment of the search for life by the American probes in 1976, and the possibility that not only were we alone in the Solar system, but that we always had been, the announcement by NASA, on August 7th, will live for a long time in my memory. My first reaction was of astonishment and joy. My second was: "We are going to Mars, and I might live to see it happen!"

As I was getting ready to go to Starfest, I was listening to CFRB in Toronto, and heard one of their hosts (John Oakley) talking about it. He had on an astronomer from York (Paul Delaney), and some UFO contactee. I called up to give my two cents worth, and when I told John that I regarded this as one of the biggest headlines in the history of newspapers, he asked me if I was being facetious. On the air I said that to

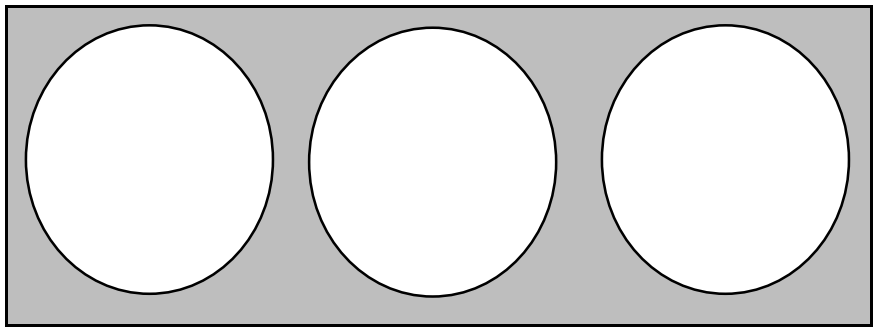
24 Jupiter Report Form Part 2

Drawing #	Drawing #	Drawing #
Date UT	Date UT	Date UT
Time of Drawing UT	Time of Drawing UT	Time of Drawing UT
Seeing Conditions /10	Seeing Conditions /10	Seeing Conditions /10
Sky Transparency /10	Sky Transparency /10	Sky Transparency /10
Eyepiece mm	Eyepiece mm	Eyepiece mm
Magnification (x)	Magnification (x)	Magnification (x)
Filters Used	Filters Used	Filters Used
Calculated Longitude of Central Meridian	Calculated Longitude of Central Meridian	Calculated Longitude of Central Meridian

Notes:

24 JUPITER REPORT FORM PART 1

Observer:
Address:
Observing Station:
Telescope Description:



Drawing #	Drawing #	Drawing #

Notes:

finally be able to say that life had arisen somewhere else than on our own fragile, blue planet was wondrous news. I was cut off before I could say more, but I phoned back and asked for the phone number where I could reach Paul Delaney. I called him, introduced myself, offered my condolences on Oakleys other guest, and promptly invited him to come and talk to the Hamilton Centre. He will be our November speaker. You see, one thing about being the person responsible for finding speakers is that when an opportunity presents itself for getting a speaker, you take it!

Anyway, onto more mundane things. The Hamilton Centre needs YOU! With all the changes going on at the National level, with things like U of T Press handling the fees for the RASC, like the change over from the Journal of the Royal Astronomical Society of Canada to (wait for it) the Journal of the Royal Astronomical Society of Canada (yeah, the name change was vetoed at the last General Assembly, in July, although the content and format will be completely different), and the addition of SkyNews to your membership, there is a great need for people in Hamilton to ensure that the changes go as smoothly as possible. We also need people to help us take advantage of them. We need people to help with membership promotions. We need people to help with public nights, and with telephone committees. We need people to show Hale-Bopp to. In short, we need people, and YOU are a person. We have found that we need as diverse a group of people that it is possible to get.
Worried that you might not fit in? I was, but you have my word that YOU ARE needed, and that YOU CAN help. The Centre does not belong to me; it does not belong to the other people on the board, it belongs to you! And right now, your Centre needs you.

How do you get on the Board? It is quite simple, really. All you need is one person other than yourself to sign the paper in this months Orbit, and your signature. Not sure if you can get a signature? Ask me, I'd be happy to.

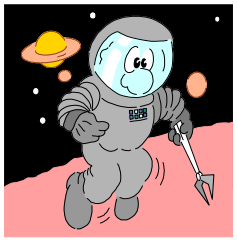
Then, give it to anyone on the current Board, and they'll make sure that it gets to our secretary, Dave Coulson. If you did not make it to the meeting, you can mail or fax it to me, and I'll be the co-signer, and I'll make sure it gets to Dave. One last point, though. We'd like the forms in by the middle of September, say by the September Board meeting (September 19, at the Observatory). It just makes things a little easier to plan. This year promises some great things - don't miss out on them just because you think you have nothing to contribute. You have plenty, and the Centre wants, and needs you.

Lastly, a quick word about Starfest. Once again, an incredible time was had

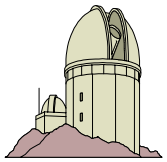
by all. Was it the best ever? Maybe. It was great meeting some old friends, and cementing friendships. It was also good to finally put faces to some e-mail names. Mostly, it was three long nights of almost perfect weather. Oh, one night we had a fog bank or two roll through around 3 am, but I don't think that the skies at The River Place had ever looked better. Even during the day, the sky was an incredible deep blue. I was able to cover the Sun with my thumb at arms length, and not have to squint! The Perseids put on a lovely show, and Hale-Bopp was there, a year after my first look at it. What more can I say - I'm addicted to Starfest!

Clear skies to all, and see you at the Observatory! ☆

email: roger@ad-here.com
voice: (905)878-5185
fax: (905)878-3974



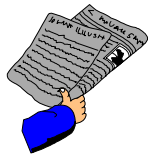
Roger Hill



STARFEST '96: A PERSONAL VIEW

Starfest '96, August 8 - 12, at the River Place Campground near Ayton, Ontario (north of Mount Forest) is an annual gathering of some 600 amateur astronomers. This year it was its usual roaring success. Andreas Gada, in his typical diplomatic style with the gods of meteorology, pulled off another of his coups and excellent weather prevailed for the whole extravaganza. But it was cold at night! Next year I will take some winter clothing! There has never been a Starfest, yet, that was totally 'weathered', rained (surely not snowed!) out.

As usual, I sent in my critique after I got home, because these are often fairly lengthy. It was mostly to the positive, but I retain continuing doubts about the trends which have been emerging over the last eight or so years. This year, Jack Newton, again, moved everyone with a collection of CCD



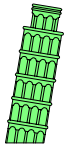
CLUB SUBSCRIPTION DEAL$

Astronomy, Sky & Telescope, CCD Magazine

A benefit of being a paid member of the Hamilton Centre is that you may take advantage of reduced subscription rates to astronomy magazines. If you are a current subscriber you can renew at the club rate and your subscription will be extended by one year. However for this first time it is necessary that we collect FIVE subscriptions to a magazine before we can send in our order.

ASTRONOMY	*(12 monthly issues)*	*$44 Canadian*
SKY & TELESCOPE	*(12 monthly issues)*	*$48 Canadian*
CCD Astronomy	*(4 issues)*	*$29 Canadian*

As treasurer I am required to collect the money and mail it in. Please make your check payable to Hamilton Centre, RASC. Your canceled check will serve as your invoice. Provide me with your instructions, full name and mailing address. If you are renewing for Astronomy magazine please include your current customer number from the magazine mailing label. Place the paper and check in an envelope and pass it to me. Mailing Addresss: John Kezys, 8 Seymour Dr., Ancaster, ON L9G 4N1 ☆



GALILEO STUDY GROUP

The Hamilton Centre is forming a study group on " The Life and Times of Galileo". We would explore the life of Galileo, his scientific achievements, the drama of how society accepts revolutionary scientific thought, the transition from an Aristotelian to a Copernican view of the universe and other issues.

We would meet once a month during the fall and share ideas. In the spring we would provide a presentation at a general meeting. Our first meeting is planned for the observatory at 8 PM, Saturday October 5. On that date as an introduction we will discuss in general terms the astronomy of the ancient Greeks and the Life of Galileo. Members of the group are encouraged to do some reading on this topic before the meeting, and to bring books and articles that would be a resource to our study group. If you are interested in joining the group (no expert or scholars need apply, just an inquiring mind) or if you wish further information please contact John Kezys at (905) 648-5542 or kezysj@operatns.mohawkc.on.ca ☆

NOMINATION FORM

For the Board of Directors of the
Hamilton Centre of the
Royal Astronomical Society of Canada

I, _____, being a member in good standing of the Hamilton Centre of the Royal Astronomical Society of Canada, do hereby nominate

_____ for election (or appointment) to the Board of Directors of the Hamilton Centre of Royal Astronomical Society of Canada, above election to be carried out at the annual meeting.

Nominator Signature: _____

Date: _____

I, _____, being a member in good standing of the Hamilton Centre of the Royal Astronomical Society of Canada, and being at least 18 years of age, do hereby accept my nomination for election (or appointment) to the Board of Directors of the Hamilton Centre of the Royal Astronomical Society of Canada.

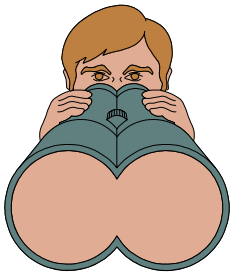
Nominee Signature: _____

Date: _____

Associate Members can only stand for appointment to the board in order to full remaining position after the election at the annual meeting.

images as large as the National Geographic-Polomar Deep Sky Survey. His theme ? Well no theme, just a big collection. And this is where I take umbrage. Starfest has gone from deep sky observing to refractors vs. reflectors to telescope testing to computers to CCD imaging and on in this bid for more and more technology and more and more precision and, as I see it, less and less science.

Our Centre has a photometer which cost a great deal and sits unused, mostly, because its too complex for most amateurs to use. There is a lot of rigmarole to using one and this is what deters most membership, whose observing time is short and precious. Is the CCD going to go the same way? I hope not! However when one comes right down to it, the three most successful science projects in the Hamilton Centre were Derek Baker's Jupiter drawing project, Eric Golding's analysis of Saturnian ring structure, using the occultation of a star in Sagittarius and Richard Petrone's Jupiter drawing project to analyse the effects of Comet Shoemaker-Levy. Requirements: telescopes, short-wave radio, tape recorder, sharp eyes, pencils and paper! Would we have done better to spend the photometer money on drafting supplies? These were meaningful projects to many people. Many great images resulted.



Technology is not always a great fix. Does this mean I want to toss it out of Starfest? Never! But Starfest needs astronomical themes because most people want to hear about the night sky. The application of technology to these themes is the key. The 'process' needs to wrap itself around the 'content' and not vice versa. We need drawings, computer programs, CCD images, history and cultural effects of Jupiter, of regions around suspected black holes, of the possibilities of life on Mars (or elsewhere), of Galileo's observations, of Mayan astronomy, of star-forming regions in the Milky Way etc. The list is endless.

I hope we can move more and more in this direction because most amateurs want information and content about the sky. The technology will just help us get there in a better way.

Michael Jefferson
☆

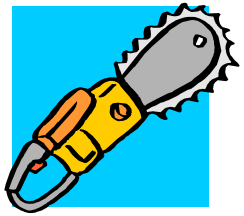
CRIMINALS STRIKE AT HAMILTON CENTRE

Some time between August 22/96 and August 28/96, thieves attempted to break into the Hamilton Centre's Leslie V. Powis Observatory. The attempted entry was discovered Thursday, August 28/96 in the afternoon.

After noticing that the picnic table was out of place, and that damage had been done to the doors and the eavestrough downspout, a further walk around was done. One of the windows had been removed from its frame, and placed aside. An attempt had been made to gain entry through this side window, and when that failed, an attempt was made to enter the building through the dome above.

After attempting to contact the people who had signed into the log book, the Hamilton-Wentworth Regional Police were contacted. They dispatched an officer who reviewed the site. Shortly thereafter, a constable arrived, and reviewed the site, the damage, and took many fingerprints.

Fortunately, due to the robust construction of the facility, the thief or thieves were unable to gain entry. It was obvious however that they did not bring heavy duty equipment with them, otherwise they may have succeeded.



We have had some difficulty determining the exact time of the break-in attempt. This is due to incompleteness in the logs, and possible lack of diligence on behalf of club members. It may be that the break in occurred earlier in the week, but those who visited the site did not notice.

Later on the evening of the 28th, Charles Baetsen, John Kezys, Bob Botts, and Colin Haig undertook some of the necessary repairs. This included reinstalling the window, repairs to the frame, and subsequent upgrades and repairs. Keyholders will receive new information regarding security procedures.

If you ever discover something, don't hesitate to contact the Hamilton-Wentworth Regional Police. ☆

MEMBERSHIP APPLICATION

Application for Membership in the Hamilton Centre of the RASC. Annual membership officially commences October 1. We welcome people of all ages, skills, and interests in things Astronomical. Please make your cheque payable to: "RASC Hamilton Centre" and mail to the Treasurer c/o the address on the back. Associate membership is for those in other Astronomy Clubs. Please state the club. Full members receive: The Observer's Handbook ($20 value), Journal of RASC ($70 value), SkyNews ($22 value), and many other great privileges, including discounts on popular magazines, supplies and cool stuff. There is a Free 3 month Trial available - send no

MEMBERSHIP INFORMATION	
NAME:	
ADDRESS (1/2):	
ADDRESS (2/2):	
CITY:	
POSTAL CODE:	
DAY PHONE:	( )
EVE PHONE:	( )
E-MAIL:	

PAYMENT OPTIONS		
ADULT	**@ $49.00**	
ASSOCIATE	**@ $30.00**	
YOUTH (under 21)	**@ $35.50**	
VOLUNTARY DONATION:		
TOTAL:		
Circle one:	**NEW Member**	**RENEWAL**

MEMBERSHIP APPLICATION CHANGES FOR CURRENT

NEW, NEW, NEW...IMPORTANT...NEW, IT IS SIMPLE!!

FOR NEW TRIAL MEMBERS

Please complete the Orbit membership form on the next page.

FOR ASSOCIATE MEMBERS

Please complete the Orbit membership form and make your check payable to "Hamilton Centre, RASC".

FOR CURRENT MEMBERS

To save costs and time the RASC has contracted with the University of Toronto Press to collect membership fees and to mail out the Society's publications.

If you are a 1995 - 1996 RASC member you will receive in the mail before the end of September an invoice to renew. A prompt renewal will ensure that funds will return to the Hamilton Centre to cover our expenses. Also please complete the personal information section of the membership form in Orbit and send it to me. This will inform us that you have renewed and we will be able to check our mailing records.

If you are a new RASC member please complete the Orbit membership form and make your check payable to the "University Toronto Press". For now please pass these to me and I will send in your check with address to UTP.

As a bonus of membership it is expected that RASC members will begin to receive Terence Dickinson's new Canadian Astronomy Magazine SkyNews starting in January 1997.

If you have any questions please phone me at home at (905) 648-5542 or kezysj@operatns.mohawkc.on.ca

Thank you for your cooperation,
John Kezys, Treasurer, Hamilton Centre ☆

FUN(D) RAISING CHALLENGE

To raise operating funds for the Hamilton Centre without raising dues there are plans hold several fund raising events. In the past a car wash has proven to be profitable and fun. I have reserved the Canadian Tire Gas Station (Mohawk & Upper James) for a car wash on Saturday, September 14.

As a high traffic site, this is a popular location for car washes. I am seeking volunteers for this event. I suspect that at a minimum we need seven people. We need 2 people with signs directing traffic, 1 "go for", and 4 washing cars. We would start a t 8:30 am and finish at 4:30 pm. If people cannot stay for the whole day we can have an 8:30 to noon shift and then a noon to 4:30 shift. Maybe we can have 1 or 2 telescopes out for solar viewing and we can distribute membership brochures.

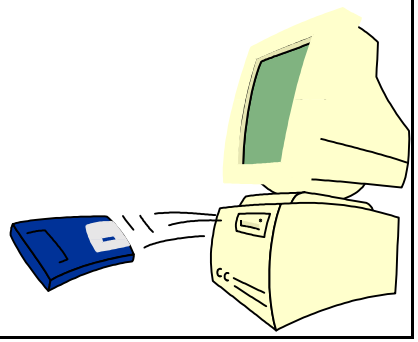
A challenge has been offered to match each dollar earned during the car wash by $1.30 up to $330. So if you can participate please contact me.

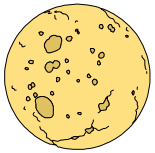
John Kezys, 648-5542, kezysj@operatns.mohawkc.on.ca ☆

Hamilton Centre Car Wash:
Mohawk & Upper James on Saturday, September 14.

Join South-Western Ontario's Astronomy List! Discuss with friends and peers from all over! Astronomy not Club Meetings! Send an email to:
bigbang@ad-here.com
Put the words:
subscribe bigbang
in the subject and the first line.

The RASC has a list, that you can reach by sending an email to:
rasclist@astrotech.stmarys.ca
Put the words:
subscribe rasclist
in the subject and first line.





GALILEO'S TELESCOPE

GALILEO'S TELESCOPE

In 1608 in the Dutch town of Middleburg it is commonly reported that two children were playing in Lippershey's eye glass workshop. By chance they lined up two lenses and observed a magnified view of a distant church weather vane. Lippershey placed the lenses in a tube and wasted no time in exploiting the financial possibilities. Knowledge of this instrument circulated quickly. Galileo learned of the telescope in 1609 and from its description he quickly fashioned his own. The following is Galileo's description of his first telescope:

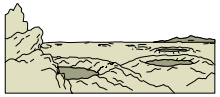
"...a tube, at first of lead, in the ends of which I fitted two glass lenses, both plane on one side, but on the other side one spherically convex and the other concave. Then applying my eye to the concave lens I saw objects satisfactorily large and near, for they appear one third of the distance off and nine times larger than they were seen with the natural eye alone."

In late August of 1609 presented a 3 foot 8x telescope to the Doge of Venice. The novelty of this instrument excited and astonished the Venetian nobility. however the value of this instrument was quite evident to the merchant class of Venice. Galileo was able to sight and report approaching ships two hours before they were seen by trained observers. This early knowledge provided advantages in setting prices on market goods.

By 1610 Galileo had instruments of 20x and 30x, and wherever he looked in the night sky he accumulated evidence which challenged common belief. For instance it was absolute Aristotelian doctrine that the planets and the moon were perfect smooth spheres. However Galileo's telescope revealed the existence of lunar mountains and mare. Galileo, due to the limited resolving power of his instrument, observed "ears" on Saturn. He observed moons orbiting Jupiter and not the Earth. The sun was observed not to be perfect since Galileo was the first to observe sun spots. These observations he shared only with his closest friends since he knew that the authorities would not be pleased about his observations. This new observational evidence contradicted the authority of the state and Galileo suffered greatly for his convictions.

Many innovations were applied to the first telescope. To reduce the defects of chromatic dispersion and spherical aberration it was necessary to increase the focal length of the telescope. Thus the length of these scopes grew quickly and by 1659 a telescope of 150 feet long was constructed in Danzig (northern Poland). It would sway and bend in the wind.

John Kezys ☆



CRATER RESEARCH PROJECT

The initial results are in from the project on CRATER STUDY at the the observatory.

The goal is to create models to help demonstrate crater formation. These models will be compared to the surface feautures of planetary bodies within the solar system. The models will then be subjected to erosional forces which will be compared to features which have been distorted on surfaces such as the Earth or Mars.

So far, we have been making high-speed videos of impacts of iron-ore meteorites into plaster. This has given great cratering, ejecta, and other interesting data. We hope to show some of the images at the September meeting. This is a fun project that anyone can participate in. Check with Bob for the next meeting. 522-9644 ☆