Hamilton Amateur Astronomers

Event Horizon

January 1998 Volume 5 Issue 3

Warm Buns at a Cold Eyepiece - Part 2

Layers & such...

In part 1 of this article we introduced the concept of cold weather clothing "**layers**", three in all. We covered the particular functions and the various fabrics suited to each layer.

Part 1 referred to our torso and legs, but, what about our head, hands, and feet? These are generally subject to the same 3-layer concept, but, require some special attention. The hands and feet, and to a lesser extent, the head, are indicators that warn us that we need to adjust our clothing. They are the first discomfort we feel when we're not quite dressed for the part.

Head

There's a lot of truth in the old adage: "*If your feet are cold, put your hat on*". I've read and heard various reports that the amount of heat lost from a bare head lies between 25% and 40%! Even conservative estimates indicate this is in the "*Wow, that's a lot*!" category. It may seem at first that this is a detriment. Quite the contrary. It gives us a range of control over our body heat just through changing headgear. So, get out your earmuffs, headbands, balaclavas, berets, babushkas, turbans, hoods, and what-have-you. They are your arsenal of fine tuning weapons with which you can maintain a balance of warmth and ventilation for the rest of your body (including cold feet!).

We mustn't forget about ventilation of the ever present perspiration making its journey from skin to the outside air. Be aware that bundling up your head may impede this process and result in condensation in layer 2 of your headgear. I find it useful to think of the head and its garments as a sort of **chimney** conducting heat and moisture in an upward direction. My various combinations of headgear then become the "**damper**" that regulates this chimney action. Too little, and you loose a lot of heat... too much and you retain heat but your head ends up wet. (like when the fireplace damper is

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Darkroom Adventures

The following is dedicated to those who are contemplating making their own colour enlargements.It is written by a fellow neophyte who last ventured into a darkroom some 30 years ago,and then only briefly.

Over the years I had accumulated quite a number of colour slides and more recently I had attempted to get a number of them printed by local photo stores.I quickly learned several fundamentals:

1) many if not most slides are unprintable in the sense that the range of brightness in a slide exceeds that of a colour print.

2) given 1) above and the automated nature of their equipment the local lab can come close but never quite give you what you want.

3) digital manipulation of the image might be possible-BUT- a

inside...

Editorial

We have a slightly shorter issue this month to to a hectic holiday for me and for my faithful team of writers. However, it's still filled with some great information.

I'd like to take a moment to extend a special thanks to our new Observing Director Tony Wallace for his interesting 2-part article on keeping warm while observing. Not only was it extremely informative (I never knew keeping warm could be so complicated) but obviously required a large amount of work. Thanks again Tony!

Now that the holidays are over I'm sure everyone has lots of turkey and chocolate to work off. I suggest finger exercises - either in front of your computer or with a trusty pen. The next deadline for articles will be Friday, February 6th. You can get them to me by e-mail, snail-mail, car, foot, camel ...

Although absent from this issue, *Ask the Expert* will return next month so if there's anything that you've been wondering - write it down and send it in.

Tracy Webb
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Chair's Report

We still have some room in our schedule for speakers at our meetings. If you have any requests for topics or know of anyone who you think would be a good speaker, now is the time to let me know.

On January 6, 1998 at 9:28:43.766 p.m. EST the Lunar Prospector was launched from a new commercial launch complex at Cape Canaveral, FL. Lunar Prospector will conduct a one-year primary mission, mapping the surface composition and internal structure, volatile activity, and magnetic and gravity fields of the Moon from an altitude of approximately 100 Kilometres. Additional mapping at altitudes as low as 10 Kilometres above the lunar surface is planned over the following 6 months. Lunar Prospector is expected to provide definitive evidence of the presence or absence of water ice in the shaded lunar polar regions.

The idea that ice might be trapped in the Moon's craters and crevices dates back to the 1960s. The first evidence of water cam from the Clementine space probe in 1994. At the end of its primary mission, Clementine took radar images of the Moon's south pole. The images suggested that dirty ice might be hidden in the moon's shadows. Some people think that there is a 50% chance that Lunar Prospec-

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HAMILTON AMATEUR ASTRONOMERS

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Web Site
http://www.science.mcmaster.ca/HAA/

Warm Buns Cont ...

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closed too far and smoke fills the room!)

I tend to dispense with layer 3 when observing since this allows better moisture flow and winds will be low or absent at these times. Layer 2 is supplied by all manner of **non-cotton** headgear. I must admit to a personal neglect of layer 1 in cold weather observing because I don't like snug fitting headwear. Nevertheless, I DO own a polypropylene balaclava which gets use in really cold and windy conditions. The key to headgear is to have a number of options available to you and vary them to suit conditions at the eyepiece.

Hands

Your hands, and in particular, your fingers will be required to change eyepieces and make fine adjustments to your telescope throughout the observing session. As a result, they are quite vulnerable to the icy wiles of Old Man Winter.

The range of available handwear includes 3 and 5 fingered gloves, slit-fingered gloves, fingerless gloves (aka "*urchin gloves*"), mitts, combination glovemitts, and the ever useless and hard to find muff. These are available in a mind boggling array of materials from polypropylene to neoprene; Polartec to what-the-heck!

The easy way out of this maze is to apply our 3-layer principle to handwear. The basic warmth requirements are met with a polypropylene inner glove, a layer 2 type overglove that insulates, and an outer mitt of Gore-Tex or some other breathable material. The last layer is a mitt since **mitts are always warmer than gloves**.

There is, however, another important criteria affecting our choice and that is the need to be able to make fine mechanical adjustments. This can be as frustrating as picking fly droppings out of pepper with boxing gloves on unless we make allowances! This is where the particular style of handwear comes in. Those "*fingerless*" gloves are a boon in these situations. They really have only the finger tips missing and so allow good tactile sensation as well as keeping most of your hand warm at the same time. These are excellent choices for layer 2 and should be worn over a full fingered layer 1. Layer 3 can be quite a nuisance because it has to come off each time you have to fiddle with things. A good candidate for this outer layer is a Gore-Tex mitt with a Velcro closure applied to a slit across the palm. These are made for the express purpose of freeing your finger tips for work without having to remove the mitt.

My own experiences at the eyepiece have resulted in my choices as follows:

I wear full fingered polypropylene inner gloves. Over these I wear a pair of wool "*urchin*" gloves. This combo has me comfortable in most cases. However, I occasionally resort to my "**cold killer combo**". I replace the inner gloves with a pair of fisherman's neoprene slit-fingered gloves. Neoprene is the type of closed cell foam rubber used in wetsuits. The fingertips (and thumb) are slit on the palm side at the first joint allowing me to peel them back exposing my fingertips for fiddling about with filters and such. Bits of Velcro keeps the "*flaps*" out of my way until I'm ready to cover up again. This provides me with the ultimate in warm handwear and dexterity. "But it's not breathable!" you say. You're right... but read on a bit further.

Feet

Feet are unforgiving! Let's face it, the threat of cold feet are responsible for so many of us refusing to go outside in winter. Feet are the first to complain when they get cold. And they do it soooo well, don't they? Well, we can look at this positively too. This attribute makes them the early warning sensor in detecting heat loss and signaling the need to adjust our garb. Do we need to put on our hat?

The above assumes we're properly attired in the foot department. Starting with layer 1, we would wear a pair of polypropylene, or other wicking socks. Over these, one or more insulating, layer 2, types of socks. Our winter boots would suffice for

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Chair's Report Cont ...

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tor will confirm the presence of ice with its superior instrumentation.

You might be wondering why I find this interesting enough to make it the main topic of my Chair's Report. If the Lunar Prospector finds water, it could provide a tremendous boost (pun intended) to future space missions. Astronauts staying on the moon could drink it and breathe the oxygen released from breaking it down. Perhaps even more importantly, liquid hydrogen and oxygen generated by breaking down water into its elements could also be used to generate power, including rocket fuel, making the moon a possible spacecraft refueling station. The prospect is so lucrative that at least five other moon missions, some of them organized by the private sector, are planned for the next five years or so.

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good film scanner for any film format larger than 35 mm costs $4000 to$10000+ and then a $9000 dollar photo-printer is not up to snuff with the final image.

So it was,faced with the inevitable, I screwed up my courage ,bought a used enlarger and prepared to do darkroom work.For someone who loathes washing dishes let alone doing anything that involves water in combination with chemicals, this was a major decision! (It has long been my belief that the sole purposes of chemistry are 1) to work, 2) to destroy the olfactory sense of chemists and 3) to give chemists dematitis. (Regrettably--it always fails on the first point). Happily as I shall explain, my fears were unfounded.

The solution (weak, unintended pun) to my dilemma came in the form of a printing process-Ilfochrome (formerly Cibachrome). Ilfochrome is a direct slide to colour print process with several advantages:

1) The dyes used are very stable even under display lighting

2) The paper is a dye removal process.The original dye in the paper acts as a mask reducing scattering from the silver grains,hence giving a sharper image.

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Comet Data for 1998

130P/McNaught-Hughes	Feb 23.76	153	313	162
55P/Tempel-Tuttle	**Feb 28.06**	**158**	**63**	**-96**
104P/Kowal 2	Mar 2.18	160	77	-85
129P/Shoemaker-Levy 3	**Mar. 4.95**	**162**	**124**	**-40**
C/1997J2 Meunier-D.	Mar. 9.29	167	330	160
C/1997G2 Montani	Apr. 15.8	204	265	58
62P/Tsuchinshan 1	Apr. 19.07	208	118	-93
68P/Klemola	May 1.67	220	329	106
49P/Arend-Rigaux	July 12.60	289	92	-201
80P/Peters-Hartley	Aug.11.74	317	238	-83
P/1991V2(S.-L.7)	Aug.25.27	331	45	-291
83P/Russell 1	Aug. 26.11	332	200	-137
88P/Howell	Sept. 27.25	3	291	288
93P/Lovas 1	**Oct. 14.16**	**20**	**54**	**34**
98P/Takamizawa	Nov. 7.97	43	272	228
P/1983 J3(Kowal-V.)	Nov. 15.18	52	220	167
21P/Giacobini-Zinner	**Nov. 21.92**	**58**	**8**	**- 51**

*** bolded entries are favourable returns**

In addition, 2 NEA's will be come into the range of amateur astronomers.They are 132 Aethra, a Mars crosser,and 1036 Ganymed an Amor object.These objects will reach 9th magnitude at their oppositions on Dec.29,and Nov. 4th respectively.There will also be a transit of the Earth as seen from the asteroid 2 Pallas at its opposition on 1998 September 16,at the descending node.I have simulated this event using the program Redshift 2.A similar transit occurred on 1968 March 13 which happened at the ascending node of the asteroid's orbit.

Raymond Badgerow

Warm Buns Cont ...

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the windproof layer 3 except that they're often not breathable at all, or are grossly inadequate for the task! This fact alone is the cause of nearly all cold feet at the winter observing site. Extreme countermeasures may be called for here.

Recall the neoprene gloves? They are as impenetrable as rubber gloves, because, well.. that's what they are! What they do is prevent any moisture from leaving the surface of my skin at all! The skin on my hands perspires enough to create its beloved "*rain forest*", and then stops, as long as you're not too active. The insulating layer 2 has absolutely no way of getting damp from the inside, and we're not about to observe in the rain! This is known as a **vapour barrier** when used next to the skin. It is a technique used by avid campers in extremely cold conditions. They (I) go so far as to spend the night using a **vapour barrier** sleeping bag liner to eek out a 10 to 15 degree advantage over life without one. The vapour barrier is a kind of **Layer 0**. It can be used to advantage when you're not very physically active. Get too active and you'll drown in you own perspiration!

Getting back to our feet, it is this secret weapon we will deploy to guarantee that the familiar cozy feeling prevails. After all, our feet aren't up to much when they're not complaining, are they?

All we need is to don a couple of plastic bags as the first layer and cover them with layer 2 socks. Don't laugh, but, I find bread-wrappers are great for this... the kind without holes in the bottom. The extra length makes all the difference. I first discovered this while on a fall camping trip with the local motorcycle club. It was a cold and rainy return from wherever we'd been and I was intrigued to see the more experienced among us snap up all the bread wrappers left over from our food supplies and wear them inside their socks. One has to be a quick study in a bike club. I found it made a big difference on the ride home. Too shy to try? Nobody's going to see anyway!

I have not yet needed to resort to this level of footwear while observing. However, people are different in their... let's say... cold tolerance limits. My wife, for example, would pack snowmobile boots for a trip to hell and still complain of cold feet. I suppose that's exactly what she'll give me for writing that... hell *and* cold feet! I include it here for these folks, and for completeness.

My personal solution to cold feet is a bit more conventional. I start with polypro socks, then a layer of wool or synthetic socks. I'll include a second layer of these if I'm to wear my size 12 hunting boots. I take a size 10 shoe, but, the size 12 boot keeps the layer 2 socks thick and fluffy! My preference, though, is to wear a pair of "*moon boots*" over the polypros and single pair of wool socks. "*Moonboots*" are a wonderful invention fashioned directly after Inuit mukluks. They are available at specialty outdoors stores such as Mountain Equipment Co-op, REI, Eastern Mountain Sports, etc. They consist of a mid calf length upper of ripstop nylon that has been stuffed with Hollofil or some other synthetic insulation. This is attached to a thick sole of Evazote (the yellow spongy closed-cell foam that some sleeping pads are made of) that has been finished by covering with heavy Cordura material for durability. The ripstop nylon seems to form enough of a wind barrier and still allows moisture to escape freely. They're the best when the snow has no chance of melting.

"Fuel"

Now that we've learned how to dress ourselves, there's one more area to cover. While we're out observing we need to consume copious amounts of hot drinks. These go a long way to make a cold night a pleasure for all but the most obstinate curmudgeons.

A word about alcohol... **DON"T**. There's nothing wrong with a glass of wine or a "wee dram" of the aqua vitae. I sure wouldn't refuse one! However, there is real danger in downing a even a few of these. The ability to sense subtle changes in temperature is easily impaired without us even noticing. By the time we're aware that we're cold, the best thing to do is pack up

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Warm Buns Cont.

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and go home because, in reality, we are probably well down the road to hypothermia, from which some never return. 'nuff said.

The usual hot chocolate, Ovaltine, and herbal teas are fine companions. Be aware that strong tea and coffee result in a net loss in the body's water reserves. Take water along to drink as well. Hot Dr. Pepper is great, as is hot fresh cider, or mulled if you like (skip the rum). Here's one of my favourite cold night recipes. I usually make 2 litres.

Pour 1 pkt. raspberry Jell-O into a bowl.

Add 1 litre hot water. Stir until dissolved.

Add fruit punch drink crystals to taste.

When it is OK to the taste, add some more!

Stir and pour the lot into a thermos.

Go to the observing site.

Pour the lot into you and your friends.

Don't let it go cold in your mug lest it become sloppy Jell-O!! Oh yes! Be careful around the 'scopes. I just hate those sticky Naglers, don't you?

Parting thoughts

There you have it! Remember the 3 layer formula and a few tricks with the extremities and you'll be a winter observer in comfort.

Exercise an extra bit of common sense before deciding to venture out. That is: don't expect great results in -40 degree temperatures! Your 'scope will likely tell you when it's had enough of that nonsense by creaking loudly or just refusing to move! If you should get cold and aren't sure what to do about it, just go for a walk. It is surprising how little we have to do to get warm. I'll bet it takes less than 100 metres to restore your comfort.

Now then! No more excuses. I expect to see you all ogling the skies at observing sessions from December and right through March... We'll exchange hot drinks and munchies, OK?

Clear skies, warm nights,

Tony Wallace, Observing Direc-

A challenge from Doug!

Alright - everyone out there has super-powerful computers AND we know the Leoninds may be excellent in November, 1998. I wonder if anyone out there can use their computer to calculate where on the sky that clump of cometary debris would be between now and next November! If the angle between the Sun and the Earth is sufficiently small as seen from the clump, it might be possible to photograph the clump by its backscatter *prior* to the arrival of the clump at Earth.

If you choose to take this challenge tell us about your results in the EH!

-Doug Welch

The next meeting of the Hamilton Amateur Junior Astronomers will be on Monday, January 19th, at 7:00 pm. If you have a budding astronomer this is the place to be! We learn about space and astronomy and have fun at the same time with activities and games. All children are welcome. The meetings take place on McMaster Campus in the Bourke Science Building, room 148, right beside the planetarium. For more information contact Rosa Assalone at 540 8793 or Tracy Webb at 525-8745.

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3) The paper is resin coated so that 2 to 4 minutes of final washing in room temperature water is all that is required.

4) At room temperature the cycle times are acceptably short:

develop-4min
rinse-30 sec
bleach-4min
fix-4min
wash-4min

5)The chemicals have no overpowering odour. The residues when mixed together are PH neutral and can even be disposed of in septic systems.

Chemicals and paper bought locally at Burlington-Camera, the cost per 8x10 enlargement worked out to be $2.40 to $3.26 per sheet depending on how much chemical is recycled from one print to the next. If developed in a drum only 75 ml of each chemical is used per sheet,and 40ml can be reused with fresh chemical for the next print. Drum processing is particularly convenient in that you can have your enlarger in a dark room and once you have loaded the film into the light tight drum, you can run off to the kitchen to do processing.

Using the suggested exposure given in Ilfords "Colour Print Manual" I found that after one test print I had an acceptable print. I shall bring some of the first prints to the next general meeting so that anyone interested can judge first hand what is possible.Here are a few things I learned firsthand:

1)Don't expose and develop the top sheet in the paper pack-it's a cardboard spacer

2)Don't buy those $36 double sided squeegies, they destroy your print. A seven dollar windshield wiper and a flat surface (I use a large piece of plate glass in the dish holder in the sink) works much better.

3)Do be sure the drum cap is on tight before you pour the developer in!

4)Don't be afraid to use paper cutout masks to selectively develop local areas of the print.I was amazed at how extreme an adjustment you can make, and yet not be able to detect the fudge on the developed print!

5)To dry prints, just squeegy the excess water off and lay them face up on a fiberglass window screen. Initially they will curl into a cylinder with the edges pulled in.Later they flatten out. If you find the corners get caught in the screen,you can safely roll the curled print onto its face. When dry it will not stick to the screen.

That's it for now.Next adventure-printing to Ilfochrome colour transparency material.

-Everett Cairns

Cool Astronomy Internet Sites

Recommended by Everett Cairns:

http://www.foto.unibas.ch/
Photolab of the University of Basil.

http://www.tiac.net/users/atm/
Amateur telescope making.

From Bob Botts' exhaustive list:

http://www.panspermia.org/
Discussion of the panspermia theory.

http://liftoff.msfc.nasa.gov/RealTime/JPass/
Satellites.

http://wood.phy.ulaval.ca/lmt/home.html
Information on the liquid mirror telescopes.

http://ngst.gsfc.nasa.gov/
Information on the Next Generation Space Telescope

http://antwrp.gsfc.nasa.gov/htmltest/rjn_bht.html
Virtual Black Holes - information and simulations.

Announcements

HAJA's Getting a New Scope!

Bob Botts has kindly volunteered to build the Hamilton Junior Amateur Astronomers a 6 inch Dobsonian telescope! However, we need a few things:

- spider
- secondary
- primary cell
- finderscope
- mounting rings for finer
- plumbing flanges for bearings
- flat black paint
- eyepieces
- focuser
- beer

Any and all help would be appreciated!

Doug's Stuff fer Sale!

Mirror-making material	-contact Steve Barnes
Super 8mm Canon movie camera	$50
Canon TL body plus f.1. f/1.8 lens	$75
300mm f.l. f/4.5 Dimension telephoto	$75
(Canon TL plus 300mm telephoto combo)	$125
Tele-extender	$5
Keychains	$5 each
FAX/Phone line-splitter	$50

Tektronix 2205 20-Mhz dual-channel oscilloscope
Condition: like new. Original packing box plus manuals. $1300 new - Make me an offer

Contact Doug Welch
Telephone: 524-0848
E-mail: welch@physics.mcmaster.ca

Reminder - The Royal Astronomical Society of Canada, Hamilton Centre meets every first Thursday of the month in the Spectator Building auditorium.

CALENDAR OF EVENTS

- Friday, January 16th, 7:30 PM
- Monday, January 19th, 7:00 PM
- January 23,24,30,31 , 8:00 PM
- Thursday, February 5th, 8:00 PM
- Friday, February 13th, 7:30 PM
- Friday, February 20st, 7:30 PM
- February 20,21,27,28, 8:00 PM

COUNCIL MEETING - At the home of Tracy Webb. Call Stewart at (905)-827-9105 if you are interested in attending.

HAJA MEETING - McMaster Burke Science Building, room B148. For more information contact Rosa Assalone at 540-8793 or Tracy Webb at 525-8745.

BINBROOK OBSERVING SESSIONS - Proposed observing nights. For confirmation or directions call Tony Wallace (526-6154) or Ann Tekatch (575-5433)

RASC GENERAL MEETING - At the spectator Building auditorium.

HAA GENERAL MEETING - At the Spectator Building auditorium. The speaker will be Glen Petitpas of McMaster University who will be talking about *Inflow in the Starburst Galaxy M83: Fuel for the Fire?*

COUNCIL MEETING - Location to be announced.

BINBROOK OBSERVING SESSIONS - Proposed observing nights. For confirmation or directions call Tony Wallace (526-6154) or Ann Tekatch (575-5433)