

# Event Horizon

**Volume 18, Number 1**  
**November 2010**



## From The Editor

For this first issue of our new membership year, we have a first for the Event Horizon. Bill Tekatch has put together a couple of short videos using a series of still images he took of Comet Hartley 2 last month. You'll find them on page 7.

Steve Germann and John Gauvreau have traded roles for the new membership year. John's Chair's Report begins on this page and Steve continues the Sky This Month column on page 11.

Jim Wamsley and Harvey Garden continue to offer tips and suggestions on how to make your observing experiences more enjoyable.

I hope you enjoy this month's issue of Event Horizon!

Clear skies,

Ann Tekatch  
Editor@amateurastronomy.org



## Chair's Report by John Gauvreau

It was 17 years ago this month that the Hamilton Amateur Astronomers first came into being, with its first meeting and first issue of Event Horizon. And so this month, we begin a new year in the club and a new council has been put into place, volunteering their time, effort, and energy to make this club the best it can be and to ensure that you get the most out of it.



The council consists of 9 directors, each of whom has assumed a specific area of responsibility, and up to five councillors. Let's meet the elected directors. Second Chair: Jackie Fulton, who is no stranger to this position, fills The Second Chair. She has been a vibrant and driving force in this club and brings a level of energy and enthusiasm that is unmatched. She will continue to be an approachable and friendly face that you will enjoy getting to know.

Treasurer: Also returning to his established position is our trusted Treasurer, Don Pullen. You see him at the door at each monthly meeting, and Don does so much more behind the scenes that you may not be aware of. Beyond all else though, he works diligently to keep our

finances and paperwork in order, and does this thankless job expertly. Secretary: The other familiar greeter at that welcoming table each monthly meeting was Jim Wamsley. Jim has left his position as Membership Director to become the club Secretary. Handling the club's correspondence, Jim will be the club's ambassador to the outside world, and nobody could be better suited than the amiable Jim.

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## Chair's Report (continued)

**Membership Director:** Taking over from Jim, as Membership Director is Matthew Mannering. New to the council, Matthew is familiar to many from the general meetings, observing at Binbrook, club outings and public events. I couldn't be happier than to have the chance to work along side Matthew this year, and I look forward to his input.

**Public Education:** Mario Carr returns as Publicity and Public Education director, which delights me as his efforts during this past year were very rewarding, and the club has benefited greatly, through increased attendance in meetings, public events and community awareness.

**Recorder:** Returning as Recorder is Michael Jefferson. Mike is one of the founding members of the HAA and has contributed in so many ways over the years. His experience and history with this club will make his contributions of lasting value.

**Editor:** Ann Tekatch is also one of the founding members of the club, and her depth of knowledge of astronomy, the club and how to bring them together has helped shape the HAA into the vibrant club that it is today. As returning Editor of our club newsletter, Event Horizon (which you are reading right now!), Ann is someone I have had opportunity to work with over the past couple of years and she has been consistently encouraging and helpful. If you haven't submitted anything to the EH yet, get in touch with Ann. It's a lot of fun!

**Observing Director:** Finally, our past chair, Steve Germann is our new Observing Director, guiding you through the starry sky each month. As the member leaving that post, I have had a particular interest in seeing it go to someone I trust, and I am delighted to see Steve take up this mantle. I look forward to his presentations, and hope that he enjoys the job as much as I did. I saved mentioning Steve until last so that I could say this one further thing; as chair for the past two years, Steve has done a wonderful job and left the position with the club in great shape. It certainly makes my job so much easier coming in to an organization that runs as smoothly as this one. Thanks, Steve.

Finally, of course, there's me. I couldn't be happier than to assume the Chair of this fine club. Astronomy has been not just a hobby, but a passion for me since I first watched the Apollo moon landings in the 1960s, and

from my first look through a telescope at an astronomy club's public night, through getting my own telescope, to teaching night classes in astronomy at Mohawk College for 20 years, this wonderful pursuit has never failed to offer something interesting, inspiring or just plain fun. Along the way though, the single smartest thing I did, and the thing that helped me get the most out of this hobby, was to join an astronomy club. You've done the same thing, and I hope you get as much out of it as I do.

And so, as you can see, we have both experienced members continuing on in areas that they know well, and new people in new positions, bringing fresh ideas to the club. I look forward to this coming year for, at the very least, the opportunity to work with them all, and I thank them for their dedication.

Aside from these nine, there are a number of Councillors at Large, who take on various tasks as needed. The club couldn't work without them, and we'll have a chance to meet them after their appointments next month.

The year ahead looks promising, as we are already planning the upcoming speaker list, public events, observing sessions, outings and activities for the club. But of course, we want you to be involved in planning this too! Please feel free to speak to any one of us about any ideas, suggestions, or comments you have. And of course, come out to observe, talk to the public, write for the EH or join in any other club activity. Also, feel free to attend any council meetings you like, where you can see first hand what goes on in the planning stages and contribute any thoughts you might have. All members are welcome!

When this club was formed it was "dedicated to the enjoyment of astronomy" and in 17 years that hasn't changed one bit. I enjoy every minute of it. See you out there.

John Gauvreau  
chair@amateurastronomy.org

### **Masthead Photo Credits:** The Sculptor Galaxy (NGC253) by Bob Christmas

Image info: Taken October 8, 2010 from Barry's Bay, ON; Canon Digital Rebel 300D through a Tamron 300mm f/2.8 lens on a Super-Polaris EQ mount; 5 x 2 minutes = 10 minutes total.



## November 2010 Treasurer's Report by Don Pullen

(Unaudited)

Cash opening Balance (1 Oct 2010)	\$ 4191.35
Expenses	\$ 339.13
Revenue	\$ 901.00
Closing Balance (31 Oct 2010)	\$ 4753.22

### Notes:

1. Major revenue sources included: 50/50 (\$46), Memberships (\$855)

2. Major expenses included: PO Box rental (\$146.90), Binbrook Donation (\$100), Office Supplies (\$60.73), Welcome Booklet Printing (\$31.50)



## Dew Busting - The Whys & Wherefores by Jim Wamsley

In the past I have written about making your own dew straps. In this article I am going to make a stab at telling you why you need to have dew busting equipment at all.

Wikipedia's definition for dew is, "The dew point is the temperature to which a given parcel of humid air must be cooled, at constant barometric pressure, for water vapor to condense into water. The condensed water is called dew. The dew point is a saturation point. The dew point is associated with relative humidity. A high relative humidity indicates that the dew point is closer to the current air temperature. Relative humidity of 100% indicates the dew point is equal to the current temperature and the air is maximally saturated with water. When the dew point remains constant and temper-



ature increases, relative humidity will decrease."

Living in Ontario, we all know what humidity is. We live with it every day. We employ air

conditioners, and dehumidifiers on a daily basis in the summer, and scrape the frost off the windshields of our cars in the winter. But what are the effects, and consequences of dew to your astronomy equipment?

How dew will affect your scope is largely dependent on what kind of scope you have. I have an 8" Schmidt-Cassegrain so I became familiar with dew, and the problems it poses, very quickly. This article I found on the internet was a great help for me in understanding dew, and how to deal with it, and to extend my observing time under heavy dew conditions:

*Imagine that you're out with the scope. It's been warm during the day - a little humid. You've let your scope cool down as the sunset progressed to twilight and now it's dark and everything is in thermodynamic equilibrium (the telescope, optics and the ambient air temperature are all equal.) Then you notice that the front corrector plate on your Schmidt-Cassegrain is fogging up - "dewing" as amateur astronomers call it. Why is that? Everything is at the same temperature, so what's causing the condensation to form? The answer lies in the cold depths of space.*

*The most common equipment hassle that observers face at night is water on the telescope, which comes as a surprise to newcomers who expect things to stay dry in clear weather. Unfortunately, the steadiest, sharpest telescopic views are often had under precisely the atmospheric conditions that cause dew to form. At the eyepiece you first notice dim stars and galaxies becoming harder*

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## Dew Busting - The Whys & Wherefores (continued)

to see, then bright stars develop fuzzy halos -- and a check with the flashlight reveals wet haze coating the optics. In severe cases the whole telescope may be soaked. Wiping never helps (and can hurt the multi-coatings!); more water condenses the moment you stop. At this point many observers pack up, defeated. However, you can keep your lenses and mirrors crystal clear in even the heaviest dewing conditions. You just need to understand the enemy and take effective countermeasures. Dew does not "fall" from the sky. It condenses from the surrounding air onto any object that's colder than the air's dew point. The dew point (or saturation line), often mentioned in weather broadcasts, depends on both temperature and humidity. When the humidity is 100 percent, the dew point is the same as the air temperature. At lower humidity, the dew point is below the air temperature. If it's below freezing, you get frost instead of liquid water.



An example of dew physics occurs when you take a bottle out of the refrigerator. If the bottle is colder than the air's dew point, it drips with condensation. Your telescope is the bottle.

There are three methods of heat transfer - conduction, convection, and radiation. The key here is radiation. The telescope, if pointed at clear sky, is in "thermal contact" by radiation with a very cold source. At wavelengths where the atmosphere is transparent, it's only 'seeing' the 3 degree Kelvin background radiation of space.

The first line of defence against dew, therefore, is to shield your optics from as much exposure to the

night sky as is feasible. The traditional dew cap extending beyond a refractor's lens often serves this purpose well enough to keep the lens dry. The longer the dew cap, the more likely it is to work. One of the nice things about a Newtonian reflector is that its entire tube acts as a dew cap to shield the mirror in the bottom. An open-tube reflector, however, needs a cloth shroud around its open framework to gain this benefit. The cloth itself, of course, will get wet on its sky-facing side. The worst dew problems appear on exposed parts that are thin (or have low heat capacity) and rapidly radiate away their warmth. Schmidt-Cassegrain corrector plates are notorious for dewing; so are telrad sights with their exposed glass. A dew shield is reportedly the first accessory that Schmidt-Cassegrain owners most often come back to buy.

As a rule of thumb, a dew cap should be at least 1 1/2 times as long as the aperture is wide. A side benefit is that the cap also cuts down on stray light getting into the telescope. Eyepieces too are prone to dewing. Warm radiation from your face slows the process, but humidity from your eyeball and breath speeds it up. A tall rubber eyecup, the kind that extends above the eye lens all around, not only blocks stray light while you're observing but acts as a miniature dew cap when you're looking away.

The same principle works on large scales. Early on a clear morning, have you noticed grass in the middle of a field white with frost or dew while grass near a tree has none? The tree is a giant dew cap, and it can work for you too. If you'll be looking at only one part of the sky, it's nice to have trees around and behind you. Not just your telescope but your charts and accessories will stay dry longer. Trees also reduce wind problems, but a slight breeze is a good thing. Radiational cooling is slow and inefficient compared to heat transfer with the surrounding air, so even the mildest breeze will keep your telescope nearly up to air temperature. (Adapted from "Dealing with Dew," By Alan Mac Robert, an Associate Editor of Sky & Telescope magazine and an avid backyard astronomer. For the full article, see:

<http://www.skyandtelescope.com/howto/visualobserving/3304226.html?page=1&c=y>

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## Dew Busting - The Whys & Wherefores (continued)

This is all well and good. We can shield the scope's corrector plate with a dew shield, to help reduce the amount of heat it can radiate into the warmer night air. What more can we do? Heat the optics so the corrector plate or mirror stays above the dew point. There are commercially available dew straps, or you can make your own. While solving one problem, dew straps can create two others. If the optics are over heated, they can distort the image. Dobsonians and Newtonians will have excessive tube currents, as the heat from the primary moves up the tube, drawing cold air with it. An SCT with an over-heated shield can have the same problem. Pouring more heat into your scope than necessary also means shorter battery life. By the way, I don't recommend using your car battery to heat your scope, unless you have someone to give you a boost on a cold night, or join the CAA.

Controlling the amount of heat put into the optics can be done with a commercially available controller, or again you can build your own. Most of the commercial controllers regulate the heat by interrupting the power intermittently, or pulsing the power through a variable electronic circuit. Knowing how much power to put in to the optics can be the trick. Too much and you distort your image with air currents, too little and we are dewing over. There's the rub. You want to keep the surface just a degree or two warmer than the surrounding air. I have failed at this on many a night, and had to pack up and go home early.

Professional observatories have computerised systems to measure all the parameters and automatically correct the heating. In my researching for this article, I have come across a possible cheap solution to the problem, by using a digital indoor/outdoor thermometer, with a relative humidity sensor. Connecting the outdoor sensor to the corrector plate housing, you can know the optics' temperature. The indoor sensors show the air temperature and the relative humidity. Using a dew point chart, or iPod app, you can know whether to turn up the heat or turn it down. Supposedly you can delay turning on your dew heaters for some time by using this setup, therefore saving battery life. I have only had one night out observing to test this system and so far it looks like it is going to be a great new tool to help fight the dreaded dew-over.

Hi-tech is all well and good, but it's costly and there are ways to battle dew on the cheap. When I first got started with my 8" SCT, I didn't have the extra funds to go out and buy dew shields, heat straps and controllers. So I looked for ways to look after the problem without breaking the bank. I found that, by using simple products, you could build your own dew shield and heating can be supplied with a Hot Shot hand warmer.

For a cheap but effective dew shield, pick up some stiff plastic sheeting, I used a Silly Slide snow slide; you can get at the Canadian Tire or most hardware stores (in season). Cutting it to length 12", (Remember 1.5 times the aperture) then making sure it would go all the way around the scope, plus about 2" extra. Using spray adhesive, I glued some black felt to the inside. I used self adhesive Velcro to hold it around the scope. With this setup, I found I could hold off the dew for a while but without heating, the corrector plate would fog up before long.

One cold night several people I was observing with were using Hot Shots to keep their hands warm, and my scope was getting frosted up. I had a thought and activated a Hot Shot. I put it on the bottom of the dew shield close to the corrector plate, and before long the frost was gone and I was happily observing again. This did cause a small amount of thermal distortion, but it was better than packing up and going home.

I hope this article will be a help for the newer members of the club, especially those members that have recently purchased SCT scopes. I think I have rambled on enough, so, as Forest Gump would say: "That's all I have to say about that."

More photos on page 6



## Dew Busting - The Whys & Wherefores (continued)



### Photos clockwise from upper left:

- The outdoor temperature sensor attached near the corrector plate (seen just above the red dovetail plate).
- The digital indoor/outdoor thermometer used to read the temperatures of the corrector plate and the air.
- Dewstraps wrapped around the telescope corrector, the front objective of the finderscope and the eyepiece.
- A view of the whole setup including the light blue "Silly Slide" dewshield.

*(All photos are courtesy of the author. Ed.)*



## Comet Hartley 2 - Image Sequences by Bill Tekatch

Using the software program, Maxim DL, I have animated two sequences of still images I took of Comet Hartley 2. These short videos have been posted on Youtube and can be viewed by clicking the hyperlinks below each of these two images:



[Comet Hartley Sequence, Part A](#)



[Comet Hartley Sequence, Part B](#)

Both image sequences were taken from within the city of Hamilton, Ontario, Canada on the morning of October 10, 2010 with a Starlight Xpress MX916 CCD camera in self-guide mode on a f/9 180 mm telescope. The sequences play at 5 frames per second or about 685 times actual speed. In both, north is up and east to the left.

Sequence A consists of 17 images 2 minutes each taken from 1:37am to 2:16am. The sequence was started with the bright star Eta Persei just outside the frame. The auto-guider was set to hold the comet at the same location in the frame and that is why the stars are moving and appear as short lines.

Sequence B consists of 11 images 2 minutes each taken from 2:25am to 2:50am. The sequence was again started so that the bright star Eta Persei was just outside the frame. The auto-guider was set to hold the stars steady. This time the stars remain steady, and you may notice that the stars twinkle. The comet image is smeared, although you may not be able to see it because the distance the comet moved in each exposure is small compared to the comet's coma. Play the sequence several times in a row, you may perceive a faint tail in addition to the obvious asymmetry of the comet.

### 2011 HAA Calendars for Sale

Our 2011 edition of the club calendar will be available for sale at the November meeting. See Don Pullen at the back table for your copy. These make great Christmas gifts for friends and family. Help support your favourite astronomy club.





## October General Meeting Report by Bob Christmas

Every October meeting of the HAA is our Annual General Meeting, which means the election of a brand new Council for our club. HAA chair Steve Germann got this year's AGM at the Hamilton Spectator auditorium under way at 7:30 pm by saluting and thanking everybody in the outgoing Council.

The formalities of the AGM got under way with HAA treasurer Don Pullen giving his 2009-2010 HAA treasury report, including the budget year-to-date, income statement, balance sheet and revenue. Then, outgoing Membership Director Jim Wamsley gave his membership report.

After the treasury and membership reports, HAA councilor-at-large Joseph McArdle conducted the election of the HAA's new Council for 2010-2011.

With the evening's formalities completed, we took a 20-minute intermission for the usual mingling and conversations. Afterwards, Alex Tekatch drew the door prizes and the 50/50.

Then it was HAA's outgoing Observing Director and Chair-Elect John Gauvreau's last kick at the can at the monthly The-Sky-This-Month, this time for October 2010. He started his talk by soliciting observing stories from the audience, with quite a few people coming forth with their stories of observing Comet Hartley 2, the planets, and this season's deep-sky objects. He took special note of young, enthusiastic HAA member Kevin Salwach's meticulous observing logs.

John then showed an interesting image of a half-sun taken by the Solar Dynamic Observatory, which was actually a picture of the sun half-occulted by the Earth's limb (of course there had to be a logical explanation, given that the Sun has no phases). He also showed Hubble Space Telescope shots of M66, one of the Leo Trio of galaxies, and M8, the Lagoon Nebula, as well as an image of Saturn taken by the Cassini probe, showing unusual shadows of Saturn's rings.

He then showed a gallery of images recently taken by various HAA members, including images of Comet Hartley 2 (103P) beside the Perseus Double Cluster, taken by himself and by Kerry-Ann Lecky Hepburn. He also showed Kerry's great image of NGC 7380 and Bob Christmas' images of M33 (the Triangulum Galaxy), NGC 253 (the Sculptor Galaxy) and the North America Nebula. Also shown were Joe McArdle's picture of various telescopes set up at Binbrook, and Jim Wamsley's gibbous moon and close-up sunset images.

John concluded the members' gallery portion of his talk by acknowledging and thanking all these HAA members, among others, for submitting so many fine images and reports.

Then, along came John's actual tour of the October night sky, which included a romp through the constellations Pegasus, Andromeda and Taurus. He mentioned and pointed out the locations of such sights as galaxies NGC 1 and NGC 2, as well as globular clusters M15 and M2.

As in the past, John gave a short monthly lesson in astronomical history. This time, he mentioned that on this day, October 15, back in 1582, the Gregorian Calendar that we use today came into effect. This was also the 100th anniversary of Norton's Sky Atlas.

And so concluded John's talk, and on that note, here's a huge thank-you to John for all his fine work as Observing Director these past few years!

Steve's final act as HAA Chair was to announce the main speaker for November's meeting, who will be Dr. Brady Johnson of KW Telescope. Many thanks go to Steve for a job well done as HAA Chair, and best of luck to John at his new post as Steve's successor!

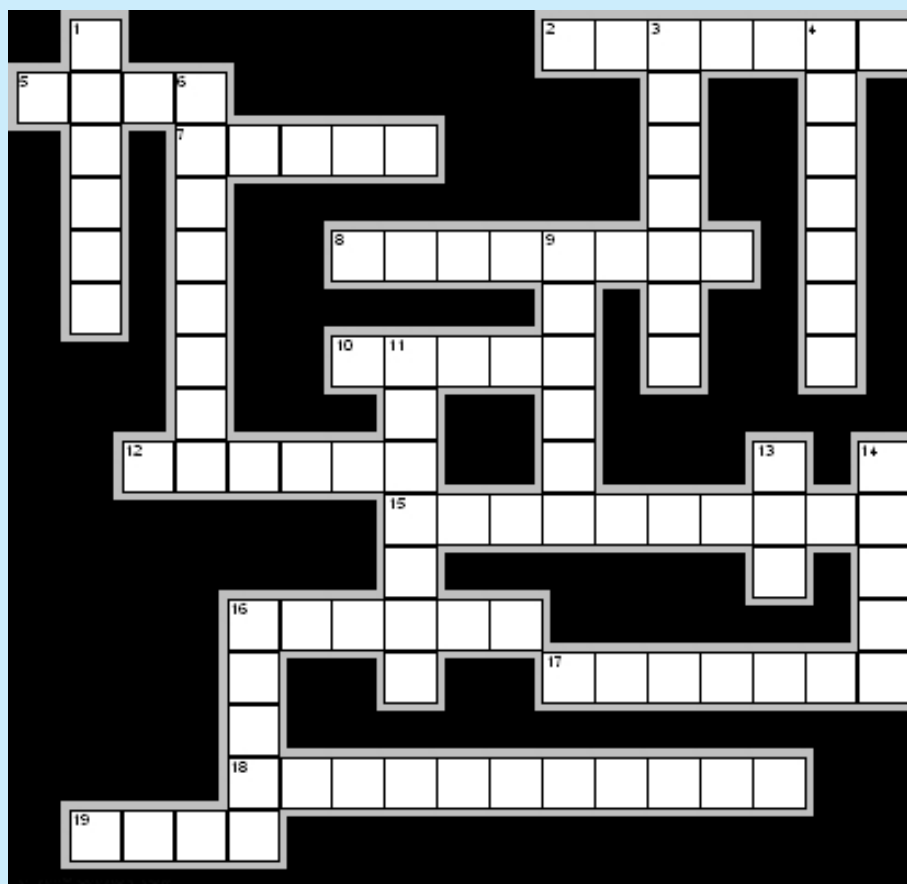


*John Gauvreau presents his final Sky This Month as Observing Director. Photo courtesy of Steve Germann.*





## Astronomy Crossword Puzzle by Mario Carr



### Across

2. 318 times the mass of the Earth.
5. M57 in Lyra is this type of nebula.
7. A star in Perseus that winks.
8. M33 is known as this type of galaxy.
10. Earth's shadow during a lunar eclipse.
12. He discovered the laws of planetary motion.
15. A circumpolar constellation that never sets.
16. A companion of Pluto?
17. A magnitude 2.7 blue-white star in Cassiopeia.
18. A feature on the moon called Mare .....
19. God of war.

### Down

1. Aphrodite and her son Heros turned themselves into fish and tied their tails together to form this constellation.
3. The double cluster is in this constellation.
4. This event in 1919 helped to prove Einstein's general theory of relativity.
6. A moon of Jupiter.
9. An open cluster in Taurus.
11. .39 AU from the sun.
13. M95, the barred spiral galaxy, is in this constellation.
14. The only known planet to have water existing in a liquid, solid and a gas.
16. A gravitational lens. The Einstein .....

(Answers on p. 15 )

### 2010-2011 Membership Renewal Reminder

Don't forget to renew your membership. Dues remain at \$25 for individuals, \$30 for families. Contact Matthew Mannering ([membership@amateurastronomy.org](mailto:membership@amateurastronomy.org)) or Don Pullen ([treasurer@amateurastronomy.org](mailto:treasurer@amateurastronomy.org)) or see them at the next meeting .



## Grow Your Own Observatory by Harvey Garden

*In this article, Harvey shares the trials and tribulations of using his observatory which, as you can see, was built atop a greenhouse! Ed.*



The above pictures of my observatory are from the west side showing the north and south sides also. When first built, my observatory had a cottage roof with four slopped sides, split east to west and housed a Celestron four inch goto Maksutov-Cassegrain catadioptric telescope. To use the observatory, I would have to open the roof one half then the other half. This would leave myself exposed to the elements - not good. I put up with this for as long as I dared, then decided to change the top to a rotating one with a viewing slit. Unfortunately there are some side affects, no exposure to the elements, able to house a larger telescope like a Celestron eight inch S E Catadioptric goto telescope which somehow managed to find a home there, etc. etc.

Please take note of the addition on the north side of the observatory, this is recent. It's housing a desktop computer. Also take note of the black frame leaning against the greenhouse door, this has one hundred and twenty meters of insulated copper wire around it and will act as an antenna which, along with the computer and another device, will make a radio telescope. I was introduced to this new venture by fellow member, Mike Jefferson, and I'm patiently waiting for my Super-Sid monitor from SARA to get my radio telescope station up and running.



*All photos are courtesy of the author.*



## The Sky This Month: November 2010 by Steve Germann

This month's featured constellation is Auriga, the charioteer, named because of its resemblance to a charioteer's helmet. This is mainly due to it having no prominent stars inside its roughly circular perimeter.

The ancient Arabs named it for a shepherd holding a pair

An interestingly named star, Alnath, 'the one that butts' (i.e., the horn) is shared between Auriga and Taurus. It's at the end of Taurus' western horn.

From our point of view, Capella, the brightest star in Auriga will rise almost to the zenith, directly overhead,



*The above star chart shows the constellation of Auriga and was produced by John Gauvreau using the free software program, Stellarium.*

of baby goats (kids). They were adamant, and each of the stars in Auriga is named appropriately. It would be great to have those clear dark skies so many nights of the year!

As November begins, we see Auriga rising prominently in the eastern sky. First of all, how can we find Auriga in the night sky? The best way to get to it is to first locate Capella, the brightest star in Auriga. Using the Big Dipper, extend the line, which is the top of the bowl, to the right (east) about 4 bowl-widths. The only bright star there will be the yellowish star, Capella, shining brightly at magnitude 0. The rest of the stars in Auriga are fainter, at magnitude 1.65 and fainter.

during the course of the night. Even by the end of November, however, it reaches the zenith only at 2 a.m. We will have to content ourselves with a lower altitude, which makes Auriga more accessible to binoculars. Mount your binoculars on a tripod, if you can. The tripod attachment for binoculars is one of the best additions you can make to your astro-gear.

To explore Auriga, first judge the limiting magnitude of your skies. For sure, you will be able to see Capella. It's a binary of 2 bright stars, respectively 11th and 14th brightest in the sky. Together they are the 4th brightest

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## The Sky This Month: November 2010 (continued)

star in the sky. How many of the stars in the oval can you see unaided? As you go counterclockwise from Capella, their magnitudes are Menkalinan at 1.9, Theta Aurigae at 2.62, and Alnath at 1.65.

Let's first look for M36. At about 25 million years old, and 14 light years across, it's the youngest and most compact of the 3 easily found open clusters in Auriga. It has about 90 members, some very luminous, and if it were closer, it would be as prominent as the Pleiades. As it is, 4100 light years away, it rewards a binocular view.

Now that you have warmed up on M36, try M37. It's got about 500 stars, and many of them have reddish tints. With binoculars you will be able to see about half of them. The others are fainter than magnitude 12. M37 is about 300 million years old, and many of its stars have matured to red giant status.

M38 is the closest to the centre of Auriga's oval. Can you also see the much fainter NGC1907, which has a magnitude of 8.2 and surface brightness of 12? It's less than a degree from M38.

Now let's consider the most interesting minor planet in the Solar System, Earth's Moon. Did you know that the Moon appears to 'wobble' during its orbit around the earth, a phenomenon known as 'libration'?

Here's an [APOD](#) from November 12, 2005, showing a complete 'lunation' or lunar cycle. What you will notice, although the moon's motion is greatly sped up, is that we can see more than just 50% of the lunar surface. In fact, 59 percent of the Moon's surface can be seen from somewhere on Earth, on a fairly regular basis. November presents a chance for you to view the 'far side' of the moon.

November starts out with the Moon's north pole tilted towards us by 6.187 degrees. This remains above 5 degrees for a few days, then the longitude libration starts to become apparent. However, at that time, the Moon will be new and the terminator will be ideally placed, illuminating about 5 degrees of the Moon's westward edge until the 11th.

Watch for the fine crescent Moon on November 7th. You are seeing some of the far side!

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## Red Star at Night, Observer's Delight by Ann Tekatch

"Ann, come and see this star. It's very red." A man of few words, Bert Rhebergen was (and is) this area's most active observer and when he beckons you to his telescope, you hurry over. He wasn't exaggerating. R Leporis was as red as a stoplight! I'd never seen a star so colourful. So began my fascination with observing carbon stars.

Often, star colours are subtle and only perceived by experienced observers. Not so with most carbon stars. They can be spectacular especially when viewed in a field of 'ordinary' stars.

Carbon stars are old, dying stars. They have gone through the stages of using their hydrogen, then helium fuel and now contain large quantities of carbon. The carbon absorbs shorter wavelengths of light while allowing the longer wavelengths, including red light, to escape. It is this same phenomenon that is responsible for making sunsets on earth appear redder when there are increased amounts of dust (eg. volcanic dust) in our atmosphere. The dust absorbs the shorter wavelengths of light and passes the longer wavelengths, so the sky appears red. Carbon stars are also cooler than other stars, having temperatures in the range of 2,000-4,000 degrees K. Compare this to our Sun's temperature of 6,000 degrees K. Most carbon stars are long period variable stars - they vary in brightness over long periods of time (a year or more).

One of the better known carbon stars is Herschel's Garnet Star or Mu Cephei. This is a naked eye star in the constellation, Cepheus, that varies in magnitude from 3.7 to 5.0. I have never been able to detect its colour using the naked eye. It exhibits a subtle reddish hue in binoculars that becomes more prominent with the increased magnification offered through a telescope. But, I've always been disappointed with this star. I think I was spoiled by seeing R Leporis first! Mu Cephei is well placed for viewing right now.

Also in the constellation of Cepheus, is S Cephei. This is apparently a carbon star of "Intense Red Colour". I haven't seen this one and hope to track it down soon. S Cep is located at RA 21hours 35 minutes 12.83 seconds and Dec 78 degrees 37 minutes 28.2 seconds. It varies in brightness between magnitudes 7.4 and 12.9 over a period of about 487 days. According to the AAVSO ([aavso.org](http://aavso.org)), observers are reporting it at about magnitude 9.0 as of

the end of October and it is slowly fading. It should be easy to spot in small telescopes.

The AAVSO comparison star chart for S Cephei can be found on the next page. (The S Cep chart is used courtesy of the AAVSO and I wish to acknowledge their generosity in allowing its use here. ) Note that the magnitudes of comparison stars are shown without their decimal points. The upper left corner of the chart gives the magnitude range for S Cep, its period, its variable star type (M = Mira or long period variable) and the spectral class for this star (C= carbon). Beneath the star's name is its position for epoch 2000.

After you've hunted down this carbon star and had time to appreciate its colour, why not take a little more time to estimate its brightness using the chart provided? Compare the brightness of S Cep to the comparison stars shown around it. Does it appear brighter or dimmer than them? I find that throwing the stars out of focus helps me see which is brighter/dimmer more easily. Be sure to jot down the date/time you viewed the star as well as your estimate of its brightness. You can compare your result to observations posted to the AAVSO website: [aavso.org](http://aavso.org). (Click on the Data tab at the top of the homepage, select Quick Look and enter the star's name as S Cep.)

Please let me know if you observe this star. I am interested in hearing your impression of it. Did it appear red to you? If so, how red? Change the magnification you view the star with and let me know how that affects your perception of S Cep's colour. If I get an opportunity to track this star down over the next few weeks, I will share my experience on the blog.

If you're observing with us and hear the words: "... come and see this star. It's very red." Make sure you take advantage of the opportunity. You won't regret it!

# Red Star at Night, Observer's Delight (continued)

**S Cep**

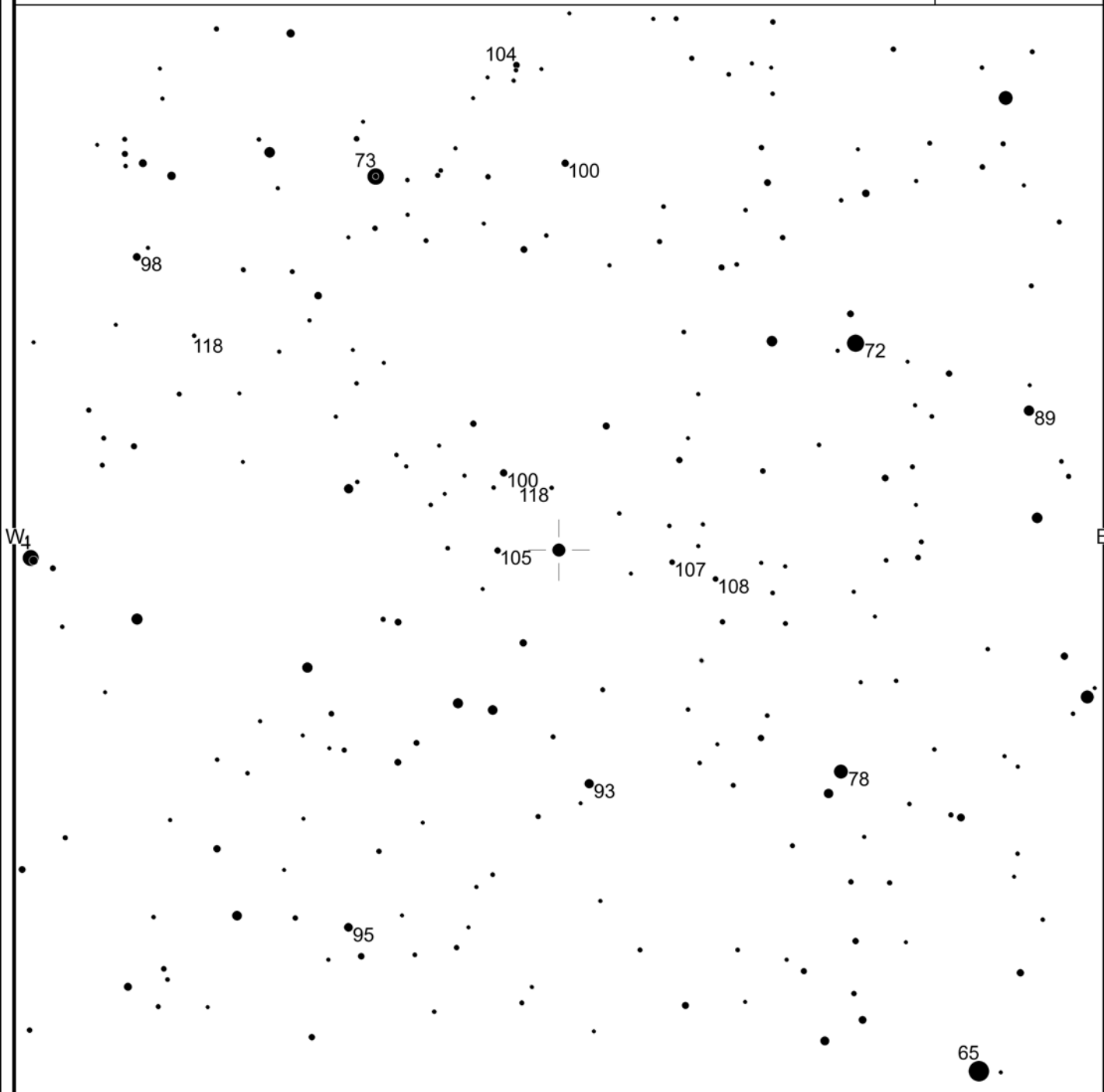
Magn: 7.4 - 12.9 V  
Period: 486.84  
Type: M  
Spec: C7,4e(N8e)

**S Cep**

(2000) 21:35:12.83 +78:37:28.2

**AAVSO**  
Chart

3325kew



FOV = 2.0°

Please use the photometry table for CCD observations.

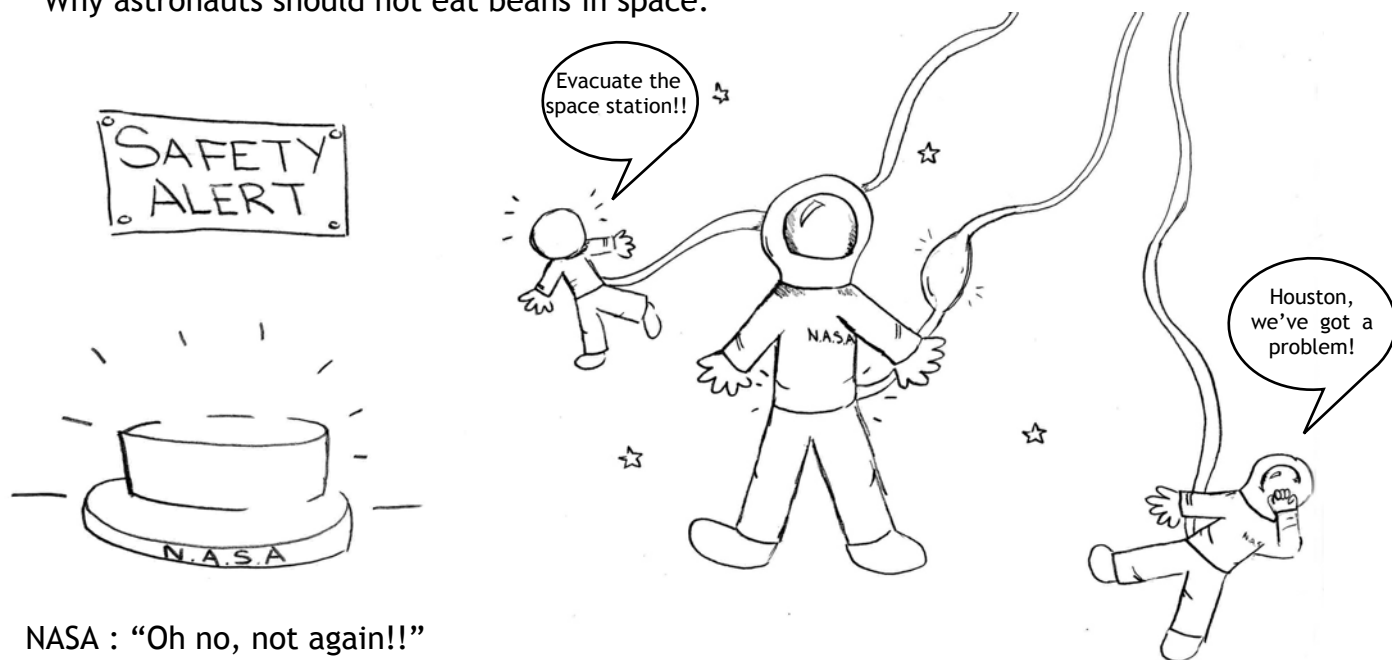
<http://www.aavso.org/observing/charts/vsp/>

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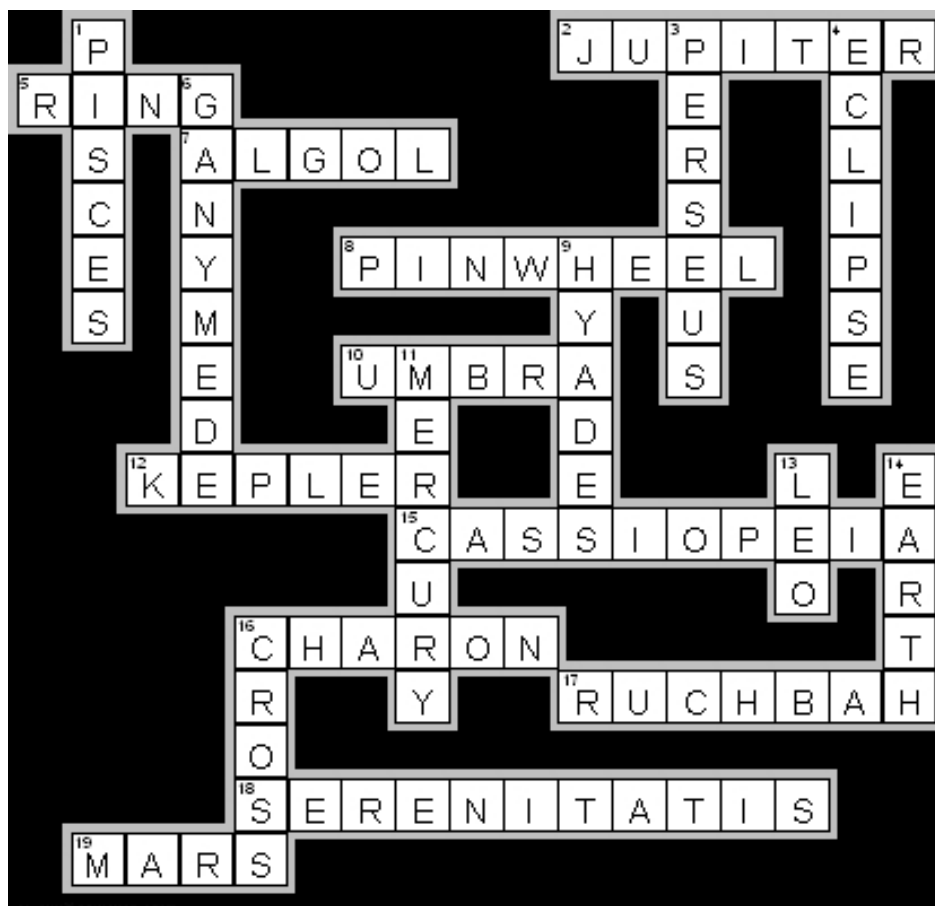


Why astronauts should not eat beans in space.



NASA : "Oh no, not again!!"

### Answers to Astronomy Crossword on Page 9



## UPCOMING EVENTS

Friday, Nov. 12 - Hamilton Amateur Astronomers General Meeting, 7:30 pm at the Hamilton Spectator auditorium.

Saturday, Nov. 20 - Cosmology Discussion Group meeting, 7:30 pm. Contact John Gauvreau, [chair@amateurastronomy.org](mailto:chair@amateurastronomy.org) for details.

Friday, Nov. 26 - Telescope Clinic at the Hamilton Spectator Building. Everyone welcome. Bring your telescope and/or questions.

Friday, Dec. 10 - Hamilton Amateur Astronomers General Meeting, 7:30 pm at the Hamilton Spectator auditorium.

## 2010-2011 Council

Chair	John Gauvreau
Second Chair	Jackie Fulton
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### Contact Us

**Hamilton Amateur Astronomers**  
PO Box 65578  
Dundas, ON  
L9H 6Y6  
[www.amateurastronomy.org](http://www.amateurastronomy.org)

### **General Inquiries:**

[secretary@amateurastronomy.org](mailto:secretary@amateurastronomy.org)

### **Membership:**

[membership@amateurastronomy.org](mailto:membership@amateurastronomy.org)

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### **Binbrook Conservation Area**

Come observing with the HAA and see what a great location this is for stargazing, a family day or an outdoor function.

Please consider purchasing a season's pass for \$70 to help support the park.

<http://www.npca.ca/conservation-areas/binbrook/>  
905-692-3228

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