

## Eclipse, Antigua

*We climbed a hill above the sea  
As a line of ants  
Would scale skyward a flying buttress.*

*Achieving the roof, we waited  
While the moon slipped  
Silently across the sun.*

*When the flood of sunlight ceased  
and the world turned dark,  
We had dropped to the cathedral  
floor.*

*Peering up the vaulted room in the  
midst of a babbling chorus,  
We saw a fringed medallion  
And two bright angels dancing gayly  
with the sun.*

*Around us, the horizon glowed  
In red sea-fire,  
Recalling the days of turmoil before  
the earth had truly formed.*

*Then, too soon, the blazing diamond  
burst in our faces,  
And we were once again on the hill,  
Facing the mundane noon*

*With regret and a thirst  
We had never known, nor knew  
Where, with what water, to slake.*

—Charles A. Whitney  
Editor, Journal of the AAVSO

## 👉 IMPORTANT NOTICE 👈

Because of vacations scheduled during the holiday season, AAVSO Headquarters will be operating with a reduced staff presence from Wednesday, December 23, 1998, to Monday, January 4, 1999. No News Flashes will be circulated (unless extraordinary circumstances arise), although the Quick Look file will be updated and available through the AAVSO web site. Responses to any requests for data or services made during this time period will likely be delayed.

Thank you, and best wishes for a happy holiday season to our members, observers, and friends from the AAVSO Staff.



## What dangers lurk near the telescopes?

by Andrew Stephan (SAA, Florida, 10 years old)

My dad Chris Stephan and I were playing baseball in our backyard one afternoon. Dad hit a fly ball over the telescopes into the back pasture. We went to find the ball. We spread out over a large area; I took the side closer to the yard. The pasture has tall grass that might now be inhabited by a number of slithering reptilians who had been occupying an acre of recently-cleared palmetto bushes. I saw a dent in the grass, but immediately jumped back after I recognized a familiar scaly diamond pattern in a coiled position!

I told Dad that there was a rattlesnake, but he thought I had heard a grasshopper. I told him I *saw* the rattlesnake. When he came over to look, he saw it, too. He stood by to make sure it didn't move while I went to find a neighbor who owned a gun. Finally, I found some neighbors who were home, and they came over and shot it for us. When we measured it, we found it was four feet long. The funny thing was, it was not rattling and was completely still until it was shot. We think it must have just eaten.

So if you think it's perfectly nice outside at the telescope, think twice!  
You never know what could be lurking just behind the telescopes.



Snake! Chris and Andrew Stephan display their rattler.

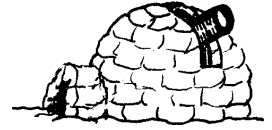
## Observers' Forum (edited by John Isles)

*This is the place where you can share observing experiences, make suggestions, ask for advice, and sound off on any topic likely to interest other observers. Material for inclusion in the Observers' Forum can be sent to the Observers' Forum editor:*

**John Isles, 11105 Tremont Lane, Plymouth, MI 48170 e-mail: jisles@voyager.net**

In this Observers' Forum we present some interesting extracts from messages that have been posted to the AAVSO's on-line discussion group concerning a problem almost all of us have to deal with at least some of the time: observing when it's cold out there—including some digressions about critters of the night! If you have Internet access, you can find the complete archive of messages at [http://www.macho.mcmaster.ca/AAVSO\\_Archive/](http://www.macho.mcmaster.ca/AAVSO_Archive/)

# The Eyes That Came In From The Cold



*Dave Sworin touched a raw nerve this last spring when he posted the following message to the AAVSO on-line discussion group:*

Now that we have had a few clear days in California in March, one of which was a Sunday night, when I got out and made a few observations for the first time in months after all those El Niño clouds and rain, it always seems that the nights are colder than I remember the last fall. I only observed for three hours but my feet were cold and numb. After putting the eyepieces in and out and focusing, my fingers were very cold. If I stay too near the eyepiece very long it starts to fog up.

I almost did not post these questions, because after all, I'm from Sunny California. Where I live at about 100 feet above sea level I have only seen ice in a puddle once in 12 years. On the hilltops where I observe at the club dark sky site, it snows on the hills every few years, but of course the next day, the Sun melts it right away quickly. It is sort of embarrassing complaining about the cold when people in the discussion live in Canada! I think they have real winters there, not lowered metabolism winters. If observers from Canada flew to California, they would be wearing T-shirts in the daytime and seeing people walking around with hats, gloves, scarves, coats, etc. Since it is getting warmer now, in the Northern Hemisphere anyway, I also wondered if I should post this, but now the cold will be fresh in everyone's mind. So ...

1. How cold does it get where you observe? Is it windy too at the same time? Is it a wet cold or a dry cold?

2. Have you ever observed with snow on the ground near your telescope?

3. How do you stay warm? Got any tips that might help me stay warm and feel warm?

4. Do the telescopes that track stars still track well in cold weather? Don't the batteries run out quickly?

5. What do you wear when it is really cold?

6. What is the best thing to eat and

drink when it is cold, to help keep you warm? Not Klondike bars, I presume!

I have a friend at work whom I took out once in the summer, July, and he wants to see the winter sky. I am afraid he will be too cold and it will be a wasted night. The night sky seems to be colder than the temperature, and it is very difficult to communicate this to "guests" so that they bring enough clothes. I do not like to leave early because they are freezing. Has this happened to you?

I have always had a fantasy of the being up in the cold arctic on a perfectly clear night with no light pollution around, and I imagine that it is just beautiful. Is this just a fantasy or is this reality? When I try to rationalize it, I think that there is less moisture in the air, so it must be very clear and transparent.

*Jerry McKenna responded:*

As all of you Easterners know this winter was simply not cold, but I do remember what cold is like (and those of you in Minnesota or Wisconsin can laugh at what a New Jersey person calls "cold"). Typically it is in the mid to upper twenties Fahrenheit during a winter evening. I can be comfortable down to the mid teens. I did a quick average for the '88-'89 winter and '96-'97 winters. '88-'89 was 28.8 degrees, and '96-'97 was 32.9. I am lucky in that I am in a secluded spot that does not get really windy.

Snow on the ground: Yes, usually the first day after a snowfall the blowing snow makes observing difficult. Afterwards it kind of stays put.

Staying warm: I wear a shirt, plus two sweaters under my coat. I also wear a wool scarf. I usually have gloves but don't keep them on if it's above 25 degrees. When it's really cold I wear a bulkier scarf and insulated boots to keep my feet warm. I also shovel a clear path so that my feet stay dry (and warm). I go in for coffee once every hour!

Telescope tracking: The tracking works for me (but I don't take pictures); the batteries don't last long.

*Lew Cook wrote:*

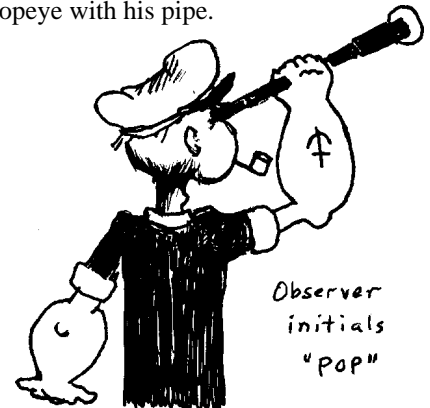
I live in the same part of the world that Dave does. Observers get cold even if the weather doesn't. Sometimes it gets to 28F. No wind. Wet. Snow on the ground? Not here. Once in Wrightwood. In Clint Ford's driveway with a collapsible 17.5-inch Newtonian when we were snowed in. Great observing!

Staying warm? Layers. Wool. More layers. More wool. Thick wool socks. Insulated boots. I wear fingerless fishing gloves in milder weather. When it's really cold, more layers. Fleece thermal underwear. I drink coffee and hot chicken soup.

Eyepieces need to be kept warm or else they fog from your breath. Keep optics in a plastic baggie in an inside coat pocket. Put a layer of insulation on it on the 'scope to retain its warmth. When the eyepiece you are using fogs up, take it out and change with the warmed one. It helps if you are near 110V. Borrow a hair dryer and gently warm the eyepieces or put them in a box with a heating pad.

*Jerry McKenna said:*

As far as fogging with eyepieces goes, I've taken a different strategy. I've stored my eyepieces in the freezer before observing and I've tried to hold my breath when at the telescope. As anyone know who uses a Celestron, it can be very difficult to keep one's breath away. I've learned to exhale out of the side of my mouth sort like a Popeye with his pipe.





*Marvin Baldwin entered the fray:*

Yes! There is a variety of ways to solve problems. I have both my telescopes "wired" with heat tape (120 volt) wrapped around the objective and eyepiece of the finder scopes and in a tube that slips over the main eyepiece. That cures my frost and dew problem year-round except for the diagonal, which has to get the treatment on humid nights with a hair dryer. I keep 400 feet of extension cord handy to give me the flexibility I need to park my scopes where ever I want. People who observe at a remote site without power have to find another solution.

Whatever the temperature, I wear a pair of lightweight uninsulated pull-on boots which keep my feet dry on a dewy or frosty lawn. On cold nights another pair sit next to the wood stove inside. If the feet start going numb I pop 'em into a pair of hot boots and keep on going.

*Brian Skiff reported:*

Most of my outside observing is done from a roll-off roof building housing the Lowell Observatory 21-inch photometric telescope, which I use about 100 nights per year. There's a picture of me at the business end of this telescope on page 90 of the May 1998 *Sky & Telescope*. Since we're at 7200 feet = 2100 meters, it is fairly cold much of the year, but since it is still Arizona, we do not get extremely cold, typically one or two nights below zero F = -18C each winter. However, an average of 210 nights per year get below freezing, thanks to strong radiative-cooling effects, which can only happen if it is not windy. Thus wind at night is unusual, at least when it is clear. The high altitude makes it dry, even if the relative humidity is high, simply because there's less air to hold moisture. No dew, period. We do however get about 120 inches of snow each winter. The total this year is 133

inches so far, with probably a bit more to come yet. Arizona? (See the <http://nimbo.wrh.noaa.gov/Flagstaff/CLIFLG> for the official details.)

From about 50F = 10C up (warmest cloud-free nights in Flagstaff are 68F=20C), I wear jeans, T-shirt, an ordinary sweater, Teva sandals (sometimes with socks). Between 50F and freezing, add medium-weight ski-bib overalls (slightly baggy ones, not the fashionably tight ones) and fingerless gloves (I'm typing on a computer constantly while observing), and definitely wool hiking socks with the Texas. This year I bought some polypro-type fabric gloves instead of the usual rag-wool ones: they were 2.5x as expensive, but are definitely at least 2x warmer and will probably last more than 2x longer.

Below freezing, down to about 20F = -7C, add thermal underwear bottoms, hooded fleece pullover over the ski-bibs, and ordinary hooded down jacket. Two pairs of heavy wool socks with the Texas.

All of this comes and goes to some extent depending on my metabolic state and how much singing or Eric Johnson air-guitar-playing I am doing. Some folks skip all that layering, and just go with a pair of those insulated coveralls sold to snowmobilers.

Below 20F, skip back to ordinary clothes with the thermal bottoms, replace ski-bibs (etc.) with expedition-weight down suit: mongo down jacket with hood and serious down pants-bibs. Basically it's a two-piece winter-weight sleeping bag with arm and leg holes. Quite expensive, and makes you look like the Michelin man, but it is not possible to be cold in this unless you're climbing K2 or whatever. Yes, two pairs of socks with the Texas. I find my feet do not get cold *if* the rest of me, particularly head and legs, is well insulated. Otherwise, totally numb feet. I find that the usual

snow-boots (Sorels, Snow-Cats, etc.) simply make my feet sweat even if they're numb-cold, and just make them colder.

*Harry Adams added:*

I live in Deep River, Ontario, which is 2 hours by car northwest of Ottawa. I observe all year round and it can be very cold. My personal tolerance for the cold is about one hour at -25 degrees Celsius (-12F). At this point I call it quits because my cheeks start to stick to the cold metal of my eyepieces. The joke goes that in Canada we get 10 months of winter and 2 months of tough sledding. Seriously though, in my area the snow can be on the ground to stay in November and not leave until April. Four months of snow is certain. In winter I used to set up my scope in my driveway or on the patio at the back of the house. To get away from the town's street lights I would go a mile out into the country and tramp down the snow in a field and set up. I now have a small observatory in that same field.

Staying warm requires preparation—thermal long johns, fleece jogging outfit, fleece pullover, quilted overalls and a pair of regular-weight socks followed by heavy wool socks. Boots are critical. I have a pair of Sorel boots that are supposed to be good down to some absurdly low temperature (-40C or lower I think). It takes a couple of hours before my toes start to get cold. On top of this goes a down-filled parka, scarf, a tuque [*stocking cap—Ed.*] and heavy mittens. I also keep a pair of insulated gloves inside my parka for doing finer work. Before I start dressing I make sure I have everything ready to go out, because all this clothing makes you overheat in a hurry unless you go outside immediately. Sweaty clothing does not keep you warm for very long.

I have a C8+. The stepper motor drive usually runs from a 12V AC adapter. This drive stops working at zero degrees C (32F). I have installed a small resistor on the stepper motor that delivers about 5 watts of heat to the motor. This has extended the drive's useful operating temperature down



to  $-10\text{C}$  ( $-26\text{F}$ ). I may install another resistor this summer. I have used batteries only above freezing and they last me a couple of nights.

I take a thermos of decaf coffee out with me on cold nights. I never eat when observing but may have a bowl of cereal at the end of an all-nighter.

Does anybody out there have problems with critters? In spring and fall we have black bears that can make a nuisance of themselves. This is one of the reasons I never take food with me on an observing session. I am seriously thinking about getting a can of bear repellent (kind of like pepper spray I am told). I also understand that a very loud sound such as that produced by the warning horn used by boaters will scare them off. Any other ideas?

We also have plenty of skunks. One trick I learned is to spread mothballs around the base of my observatory. They don't like the smell and it keeps them out from under the building. I have not had any trouble with wolves or coyotes yet. I can hear them occasionally but never nearby. I rented a cottage on the Ottawa River one summer and set up my RFT on the beach. The sound of the wolves across the river in Quebec carried very clearly over the water. Spooky!

*David Williams wrote:*

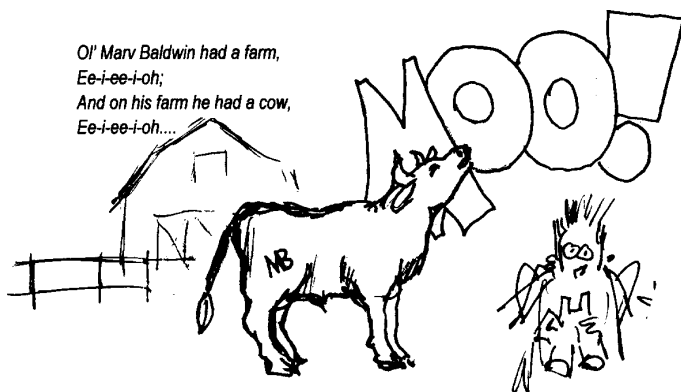
The problem with cold isn't just batteries. My equatorial mounts get so stiff that it becomes difficult to move the telescope around the field.

Whatever else you do, cover your head! I am amazed to watch other observers in parkas and boots but bareheaded. That's a big heat-loss area. As long as I've got my stocking cap on, I never need to put up the parka hood.

Applied heat to eyepieces, as mentioned by Marv Baldwin, is also good for getting to fainter magnitudes year-round. Walter Scott Houston was a big booster of putting a heating element around the eyepiece. He claimed that even in summer there is moisture on the eyepiece that cuts transmission. A little heat keeps it dry and permits optimum performance.



Observing critters: No one has mentioned dome bats. Another animal problem not yet mentioned is noise. Marv raises cattle, and they bellow at night, about 100 decibels I'd guess. You won't need coffee to keep you awake! *[This comment prompted a digressive discussion of certain strange activities that have been observed on Marv's farm; we won't repeat it here!]*



*Vladimir Steblina:*

Wow, is Harry Adams lucky to live in such a warm climate! My house in the eastern Washington Cascades gets snow in October and it melts in May. Our days are significantly warmer than Harry's, but the nights consistently go to zero during the winter. Fortunately, I also have a place in the Wenatchee Valley (thirty minutes away) where the cherries are just starting to bloom and the

apricots are already finished. You just need a place where you can drive to and from snow!

I wear a snowmobile suit and a down parka over sweats. Gloves are the rag-wool cross-country ski gloves with the tips cut off. This keeps me warm to about zero F. I agree that boots are critical. In the observatory, I wear Uggs and never had cold feet. Out in the weather, my wife bought me some hunting boots by Sorel. They're too hot to wear when the temperature is over 32F. I wear them bird hunting and they're comfortable to walk in. Now, these Sorels are not the felt-lined Sorels that many stores sell: the felt-lined ones allow the cold to come in through the soles and they are uncomfortable to wear for hours. Mine have some sort of thermal barrier in the sole. Anyway, the best cold weather gear I've owned, but not cheap at \$150.

There's a company that makes packets of spiced apple cider. Tastes good. Ran into them at some of the fire camps. Great stuff.

I've never had problems with bears while observing, but while working in the woods bears at night are a different story. They're quiet, and when one shows up early in the morning four feet away from you and you're half awake, it can really give you a start. I've never had problems with black bears that a loud noise wouldn't make them move along. Harry's air-horn idea sounds great. Just wait till they're within ten feet to have an effect. The Fish and Wildlife Service assures me that there are grizzly bears around the mountain house. Now *that* will add some spice to night-time observing!

We have a large elk herd in the meadow and their bugling all night long can be annoying. My biggest problem is the coyotes. Last summer we had one that insisted on howling outside the bedroom window—and he was tone deaf. I told my wife that he'd better learn to howl or I was going out there with the shotgun. The larger problem with coyotes is when the dogs are out with me at night. They're always trying to lure the dogs away for a quick snack. It's funny how the dogs ignore them during hunting season, but get bored with astronomy and think a quick romp with coyotes would be fun (bad idea). We have wolves in the area, but haven't heard any.

One night an about four-foot great gray owl decided to fly within a couple of feet to see what I was doing. Now *that* got my attention. The thing with animals is they're all much more active at night. I'm thinking about getting one of those night-vision scopes, just to see what really is going on around me.

*Pat Abbott commented:*

Here in Canada (with the exception of those poor people on the coastal strip of British Columbia, slowly dissolving in the rain) we are very proud of our snow and low temperatures. However, to answer Dave Sworin's questions:

1. In Alberta we get  $-40\text{C}$  most winters (this winter was mild; it only hit  $-34\text{C}$  and only for a short time). I observe for about 1 hour at  $-25\text{C}$ . Below this temperature I use my 7x50 binoculars for brief trips outside.
2. My telescope is in a sliding-roof observatory and has a wooden floor—much better than standing in the snow.
3. Staying warm means getting out of the wind, and dressing properly.
4. My Mathis mount becomes very unhappy at temperatures



below  $-30\text{C}$ . Tom Mathis told me before I bought it that his bearings were made in Canada. I suspect they were made in the Banana Belt of Southern Ontario. Batteries are not a problem for the drive as I plug in to a 120V socket. I eliminated the battery for my electronic setting circles; I use a 9V transformer. By the way, the electronic circle control box sits in a wooden box with a sliding glass front that is warmed with a heating rope. I use ropes for my eyepieces; I use dimmer switches to bring down the voltage. I am probably living dangerously!

5. For clothing I use natural fabrics only. Cotton is not usually advised as it absorbs sweat. But who sweats when standing around at  $-25\text{C}$ ? Buy boots two (yes two) sizes too big. This means that even with two pairs of wool socks your feet can move around. Walking is not pleasant as they slop around. I certainly agree about the need to cover your head; get a good wool tuque. I have wind pants filled with wool bats [as opposed to dome bats?—LMA]. (I used to keep sheep and my wife is very talented.) Parka, down-filled of course.

6. Perhaps I am odd, but I have no desire to eat or drink at the telescope. I save that for reentry.

#### *John Bortle observed:*

Although my local winter weather has moderated slowly through the years, I have observed at  $-2\text{F}$ , albeit for rather short intervals. Temps in the teens (F) are not at all unusual during evening observing sessions in midwinter here, but by far the most limiting factor is the wind. At my hilltop residence wind chill can quickly put an end to an observing session regardless of how well I've dressed for the conditions. Under such circumstances blowing snow can become a very significant factor as well.

Concerning depth of snow surrounding the scope/observatory, I've had it as deep as two feet on occasion. I have also experienced the observatory freezing shut for several days following particularly bad winter storms!

As to varmints noted in the area while observing, in summer I often hear foxes and coyo-dogs or coyotes (depends on who you talk to as to just what they are; certainly not just wild dogs, however). One year I had a family of skunks take up residence under the observatory; I trod lightly on the floor that season! Also I have been troubled by carpenter bees from time to time working their way into the framework of the building. Using pressure-treated wood during various refurbishing projects has cut down on that problem.

Does anyone have troubles with dive-bombing June bugs? Around here they give you quite a start when you're at the eyepiece quietly observing and they whack you in the head!

How many others, particularly in the eastern US, have noted the "Bortle Effect" (the name jokingly given by some VSOers from over on the GENIE network to a situation I made mention of a few years back)? It used to be that winter brought the darkest skies at my location and I always looked forward to its coming. About a decade ago I noted a subtle change begin. As the trees lost their leaves in autumn, the sky tended to grow brighter because the leaves apparently were blocking much of the artificial lighting in the area! The situation has grown steadily more obvious over the years. Nowadays, my winter skies are far brighter than those during the warmer, more humid summer months of the year when the trees are in full leaf.



#### *Gary Walker joined in:*

I observe from my observatory in the White Mountains, on top of a hill at 1800 feet. That is about as high as you get access to year-round, unless you want to be on top of a ski mountain or Mount Washington, which is unobservable in winter. The Radio Shack recording thermometer stops at  $-22\text{F}$  ( $-30\text{C}$ ), and it does that every winter. I have observed at  $-12\text{F}$  ( $-24\text{C}$ ). If it is clear in New England, you do not want to miss out just because it's cold.

Does the wind blow? Well I have never lost the shutter on the observatory but I have seen it flying about a foot above the dome, held down only by the cables that open it. (The next weekend, I added some additional hold-downs.) As for wind chill, blowing air will conduct 5 times the heat that stationary air does. Needless to say, at  $-12\text{F}$ , there is virtually no humidity. As for observing with snow on the ground, what is it they say about bears in the woods? This year it was November to April.

The last T-shirt I saw was on a skier in March; I think he had a lot of antifreeze in his system. How to stay warm? Layers, wool, polypropylene, and Polartec which has not been mentioned. Do not wear any cotton. It gets moist and cold. As for feet, after many attempts, my current setup is to use one white thin polypro sox, one wool sox, and a pair of Sorels, rated at  $-100\text{F}$  (coincidentally \$100). When it gets really cold, a Down EXPEDITION parka and bibs. (Get the ones that zip down the sides so you don't have to take your boots off to get them off; also a fly zipper, or it makes for a long night observing.)

Food is very important.

It seems that what I eat for dinner can make a big difference. I try to have dinner early, like 4:30 or so, and stay away from fat. A big carbo load of spaghetti and salad works

best. Between chopping firewood, stocking the stove, plowing snow, skiing, snowmobiling, hiking, and camping, I would say that we have high metabolism winters.

Actually snow is not the worst condition. We have mud season (1 month), and black fly season, but very few mosquitoes. Observing in New England can be summed up the following way: we have two perfect observing nights per year (when you can observe in a T-shirt, it's not too cold, and not too hot, the humidity is low, there are no bugs and it is clear)—one day in the spring and one in the fall. These just add to the challenge of astronomy.

#### *Lew Cook added:*

Give us California guys a break! Just because it doesn't get below freezing doesn't mean we don't get cold! Anyone around here seen my long pants?

If your batteries die an early death in the cold, try keeping them warm. Take them inside to keep them warm and put them in an insulated box (a cooler) to take them to the telescope. Run a wire out to the 'scope. Keep something warm inside the cooler: a warm rock or a hot-water bottle.

If the drives or mounts freeze up, consider changing the lubricants in the bearings and gears to something that doesn't congeal at such a low temperature. The synthetic motor oils are good at low temperatures. Mobil does commercials showing the fluidity of their Mobil 1 at low temperatures compared with ordinary non-synthetic lubricants. Even diesel fuel (a non-synthetic oil) freezes at  $-40\text{F}$ . The synthetic oils are also good at reducing friction and wear. (I do work for an oil company, but it isn't Mobil.) Do a test of several lubricants to see for yourself. Put them in a jar and observe how they flow or don't at the coldest temperatures. Then choose what you want to use and clean or flush out the old stuff.



*Bob Nelson:*

I live in Prince George, British Columbia (in the center of the province), where we have real winters. Cold spells, where the temperature plunges to  $-40\text{ C}$  ( $-40\text{ F}$ ) or lower, can occur here any time from November to February and last a week or two. In a given winter we may have zero, one or two such spells. (It's been zero the last couple of years.) Usually when it's that cold, there is no wind, which is a blessing. Milder temperatures from  $-30$  to  $-20\text{ C}$  ( $-22$  to  $-4\text{ F}$ ) can have a wind, which makes it hard to observe. More often the temperature at night is in the  $-20$  to  $-10\text{ C}$  range ( $-4$  to  $14\text{ F}$ ), which is quite reasonable. At all of these temperatures, it's a dry cold and the snow is squeaky under foot. Although I set a lower limit of  $-30\text{ C}$  for observing, I would say that the presence of a wind is a more serious constraint. Fog and moist air in the fall can also be a problem. I often observe with snow underfoot; it's much more pleasant than mud! (Clothes stay cleaner, too!) However, when I use the club's 61-cm telescope, I'm in the dome with a nice tile-on-wood floor.

I usually use my 33-cm "Dobby" which has no tracking motors and no batteries except in the Telrad-like finder. The club's 61-cm telescope uses power off the 120V line, so batteries are not a problem. Things are a little "creaky" at  $-40\text{ C}$ , though. One problem that we can have is differential thermal expansion. The worm gear is made of bronze and the telescope is made of steel (which has a different coefficient of thermal expansion). If the worm is jammed too tightly against the worm gear (it really needs to be spring loaded), the tension can strip some of the smaller gears.

I wear many layers of clothing and do not need to jump up and down or stomp my feet, etc. When it is really cold, first and foremost, I wear the best and warmest boots I could find, "Kodiak" boots, supposedly warm to  $-60\text{ C}$ , which I wear with two or more pairs of socks. My feet are never cold. Elsewhere I wear many layers of clothes—long underwear, ski overpants, sweater, pile jacket, and, over everything, a long down coat with a fur-lined hood. The hood can be pulled tightly over all my face, except for where the eyepiece pokes through. I may wear gloves, or gloves with overmitts. With this gear, I can stay out for hours in all but the windiest, coldest weather.

I don't usually eat or drink much when I'm observing. For a break, I'll sometimes go into the observatory (the part which is heated) and eat a granola bar. I don't usually bother with hot chocolate.

The Earth radiates away a lot of heat under clear skies at night! You cannot stress too much the need for warm clothing. I usually take most of my stuff with me even in summer. Only on a couple of occasions (following a sweltering day) has it been warm enough to observe in shirt sleeves, sipping a beer.

I'm sorry to break Dave Sworin's fantasy about arctic skies, but it's not that great. Often we can get an ice fog (or general haziness) at the lowest temperatures. Fogging and icing of optical surfaces from your breath is a real problem, as is the sting when the cold eyepiece hits your cheek. Also, your eyes can tear up so badly that you can hardly see at all. Simple tasks are harder in the cold and everything seems to work against you. Handling star charts and writing with gloves on can be really frustrating, even though one tries hard to adapt. Another problem is that you can be out on a clear moonless night when the aurora starts up and all hell breaks loose. (Once it covered almost the entire sky and I was reduced to working a small sliver to the south! At times like that, one should just give up astronomy and sit back to enjoy the show.) So I'm all for the moderate temperatures (still near freezing) that we get here in spring and fall.

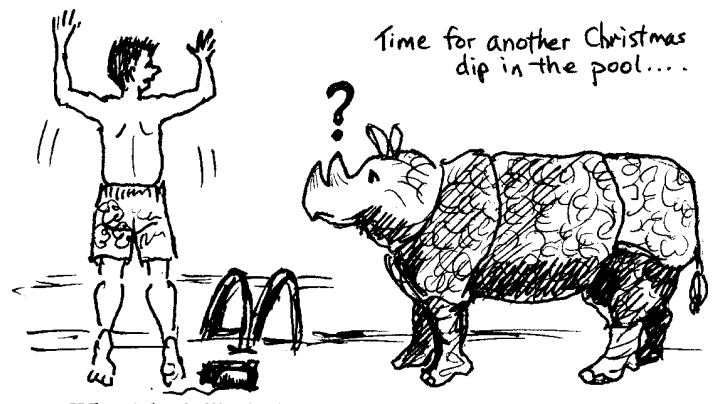
*Berto Monard said:*

I live on the South African highveld, which lies about 1400m

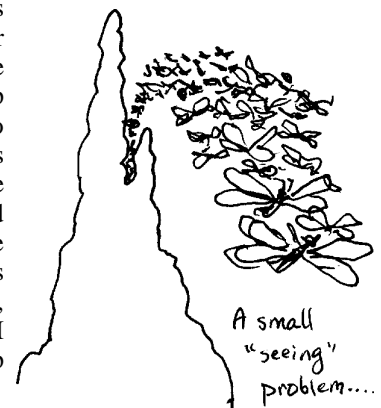
(more than 4000 ft) above sea level. Most winter nights here are clear, and a lot of heat escapes towards Scorpius and Sagittarius. Temperature drops of more than  $20\text{ C}$  are common, and that's what makes observing (or rather the observer) here "cool." As Jan Hers [not quoted here] mentioned, what we need here after the session are electric blankets and, I would add, a loving and understanding wife. We have dry cold, but even so one of the main problems towards the morning is dew on the eyepiece. A battery pack and some resistors in series around the drawtube can solve that.

Clothing changes during the winter night. I usually start off with T-shirts and shorts, then I add or replace them with a light training suit, thick-soled shoes, and two pairs of socks. What I especially look out for is that the warm clothing is worn in a way that cold bridges are reduced, i.e., socks over trousers, trousers over shoes .... "It's a technique." The training suit, which is the basis of my observing clothing, must have a cap. Wind here is rare and mostly welcome as it clears the haze. So no need for plastic clothing here.

Eating/drinking: Some oats at the end, and some red wine when it gets cold or a beer in the summer. What I also do, especially around Christmas, and believe me I am then always thinking about you observers of the North, is to jump in the swimming pool a few times during the observing session—to keep a cool head.



What I don't like is the unexpected visit of a lion or a rhino, but fortunately other people felt the same about that and so they are these days kept in game reserves (large and nice ones!). Most problems here are from insects, especially large ones like baboon spiders, which predict the rain and enter the house or observatory just to let you know. The main problem I would say is the annual crop of termites. It always occurs during a clearing after some good summer rains. The highveld is one large ant heap and the termites come out to spread to the four compass points. They grow large double wings like dragonflies, and come out from under the ground, millions of them. This is feasting time for the birds, but as soon as I notice them I close down. They will mess up the scope tube in no time.



*Gary Walker added a final note on cold batteries:*

I just wanted to mention that lithium batteries suffer almost no degradation at cold temperatures, unlike all other types. They come in AA and 9V that I know of. They are about 2–4x as much money, but they last a very long time, and will work in the cold.

AAVSO Observer Totals, 1997–1998 *Our thanks to each and every observer listed here!*

Code	Name	No. Obs.	No. I.S.	Code	Name	No. Obs.	No. I.S.	Code	Name	No. Obs.	No. I.S.
AAP	P. Abbott, Canada	1163	140	CJU	J. Coco Lopez, Spain			GDX *	D. Gamero, France	37	
ACH *	C. Accary, France	70		CNL	O. Cole Arnal, Canada	145		GPA 1	F. Garcia, Spain	58	6
AAK #	A. Ackermann, Hungary	8		COL	P. Collins, AZ1	234		GAA	P. Garey, IL	7	2
ABB	B. Adams, CA	450	40	CME @	E. Colombo, Italy	586		GTR	R. Gent, VA	75	
ADJ	J. Adams, NY	147		CBY ‡	B. Colyn, Belgium	206		GCP ¶	C. Gerber, Germany	2277	
AB	W. Albrecht, HI	413	3	CMG &	G. Comello, Netherlands	9438	1260	GGU &	G. Gilein, Netherlands	20	
ARL	R. Alencar Caldas, Brazil	392		COX *	O. Constans, France	13		GVN	V. Giovannone, NY	42	
ALN	R. Allison, IA	154	20	COO	L. Cook, CA	31		GJX	J. Goldberg, CO	1	
AAA	A. Alves, Brazil	749		CK	S. Cook, AR	1353		GHA ¶	H. Goldhahn, Germany	2423	
ALR	L. Amburgey, MA	14		CTM	T. Cook, NY	32		GIN ö	I. Gomez, Spain	73	
AEJ	E. Anderson, NY	895		CLZ *	L. Corp, France	18		GZN *	A. Gonzales, Spain	49	
AJR	J. Andress, AZ	72		COV	V. Coulehan, NY	10		GOP	P. Goodwin, LA	98	5
AAAY ¢	A. Androsuk, Ukraine	39		CGD *	G. Coute, France	19		GKA	K. Graham, IL	97	2
AQA	A. Arquiola, Argentina	1		CWD	D. Cowall, MD	7		GRL \$	B. Granslo, Norway	4594	132
AKT	T. Atkin, FL	2375	6	CLX	L. Cox, Canada	1		GRI	J. Griese III, CT	102	71
AJM *	J. Azema, France	74		CR	T. Cragg, Australia	2380	763	GCE	C. Grigoropoulos, Greece	2	
BM	M. Baldwin, IN	4555		CJH	J. Crast, NY	8		GDU	D. Grubb, IL	97	
BIV #	I. Balogh, Hungary	336		CRR	R. Crumrine, NY	79		GCT †	C. Grunnet, Denmark	40	
BFZ #	F. Bammer, Hungary	3		CTD	T. Crute, GA	5		GPR	P. Guilbault, RI	805	78
BGZ	G. Banialis, IL	8		CAQ #	A. Csaba, Hungary	2		GUN *	J. Gunther, France	3018	558
BDI ¶	D. Bannuscher, Germany	169		CBZ #	B. Csak, Hungary	64	5	GUS	S. Guryanov, Russia	1	
BXA ¢	A. Baransky, Ukraine	2276		CGB #	G. Cseri, Hungary	8		GGX *	G. Guzman, France	249	1
BEQ #	E. Barat, Hungary	81		CTI #	T. Csorgei, Hungary	84		HCS #	C. Hadhazi, Hungary	1797	1
BSR @	S. Baroni, Italy	928		CSM #	M. Csukas, Romania	349		HTY	T. Hager, CT	133	38
BCT *	C. Barret, France	40		CWX #	W. Csukas, Hungary	127	4	HKB	B. Hakes, IL	5	
BQ #	L. Bartha, Hungary	520		CKB	B. Cudnik, TX	311	4	HK	E. Halbach, CO	3381	103
BSU ¶	U. Bastian, Germany	244		DAH	H. Dahle, HI	15	4	HMG #	G. Halmi, Hungary	51	
BBA	B. Beaman, IL	24		DMI ¶	M. Dahm, Germany	445		HP	W. Hampton, CT	60	
BVD	D. Beard, PA	25		DSG @	S. Dallaporta, Italy	455		HDX	D. Hands, NC	76	
BJS	J. Bedient, HI	11		DAM 1	A. Darriba Martinez, Spain	16	6	HSG	G. Hanson III, AZ	11285	7721
BOX ö	O. Benitez Sanchez, Spain	105		DAJ	J. Davis, MD	37	14	HSI ¢	S. Harchuk, Ukraine	75	
BTY	T. Benner, PA	322	77	DJS	J. Day, England	517	42	HAV	R. Harvan, MD	764	187
BCQ #	C. Bereczky, Hungary	89		DVA	D. Del Valle, PR	47		HBL ¶	B. Hassforther, Germany	880	
BEB	R. Berg, IN	2720	29	DFR	F. Dempsey, Canada	122	1	HDO #	D. Havassy, Hungary	27	
BEN #	E. Berko, Hungary	12	1	DAY ¢	A. Deputatov, Ukraine	37		HAB	R. Hays Jr., IL	1407	
BMM ‡	M. Biesmans, Belgium	828	255	DEK ‡	K. Dequick, Belgium	2		HZL	L. Hazel, NY	293	84
BQM	M. Bignotti, Italy	8	1	DNO	O. Deren, Poland	2020		HLS \$	L. Heen, Norway	5	
BBI ‡	B. Billiaert, Belgium	25		DVC +	C. Devilliers, South Africa	44		HEF	M. Heifner, CO	391	115
BLV	L. Binder, TX	3		DVI +	F. De Villiers, South Africa	232		FYE	E. Heironimus, MO	72	
BKN	A. Birkner, IL	10		DPA ‡	A. Diepvens, Belgium	4607	351	HEN	C. Henshaw, England	57	
BKL	J. Blackwell, NH	3		DRG	R. Diethelm, Switzerland	2239	1755	HGZ #	Z. Herceg, Hungary	7	
BLD +	D. Blane, South Africa	30		DLA	A. Dill, KS	324	5	HJN +	J. Hers, South Africa	673	107
BNQ #	N. Boja, Hungary	3		DIL	W. Dillon, TX	74	2	HES	C. Hesseltine, WI	56	
BEC ¶	B. Born, Germany	650		MDS	M. Dionisi, Italy	5	2	HE	L. Hiett, VA	31	
BRJ	J. Bortle, NY	5403	2553	DMY	M. Dombrowski, CT	167	3	HRI	R. Hill, AZ	2473	2
BJO 1	J. Bosch, Spain	11	11	DPL	P. Dombrowski, CT	887	204	HIR	Y. Hirasawa, Japan	1621	117
BSX	S. Boucher, CA	4		DZS	S. Dominguez, Argentina	909		HSY \$	S. Hoeydalsvik, Norway	128	
BMU &	R. Bouma, Netherlands	1126	37	DMB x	M. Duenas Becerril, Spain	1		HTF	T. Hoff, WI	13	
BPI *	P. Bourret, France	93		DGX #	G. Dulicher, Hungary	10		HFO *	G. Hoffer, Germany	171	
BMK	M. Bradbury, IN	309	64	DMO *	M. Dumont, France	317		HGX	G. Hoffler, FL	7	1
BNW ¶	W. Braune, Germany	34		DKS	S. Dvorak, FL	1005	164	HMJ	M. Hoggarth, England	1	
BTB	T. Brait, MN	231	36	DGP	G. Dyck, MA	5391	3605	HBA ¶	A. Holbe, Germany	2024	
BHA ¶	H. Bretschneider, Germany	724		EPE ¶	P. Enskonatus, Germany	427	2	HHO \$	H. Holen, Norway	9	
BSM	S. Brincat, Malta	237	27	EJO #	J. Erdei, Hungary	602		HJO &	J. Holtrop, Netherlands	45	2
BOS ‡	E. Broens, Belgium	875	619	FEZ #	E. Farkas, Hungary	4		HZJ	J. Holtz, PA	388	
BKD	R. Brooks, IN	42		FMX	F. Farrell, Australia	106		HTB #	T. Horvath, Hungary	1	
BBT	R. Browning, NJ	13		FCA	C. Fausel, IN	260	1	HVA ‡	A. Houvenaeghez, Belgium	23	
BHC †	C. Bruhn, Denmark	5		FKJ #	J. Fekete, Hungary	471	1	HUR	G. Hurst, England	1009	157
BOA *	A. Bruno, France	155	14	FNI ¢	N. Felbaba, Ukraine	40		HDR ¶	D. Husar, Germany	3	
BCY	C. Bryja, MO	4	2	FMM	D. Felisberto, Brazil	18		HUZ	R. Huziak, Canada	1583	43
BTH	T. Burrows, CA	2149	835	FJM ^	J. Fernandez Andujar, Spain	266		IPA	P. Ingrassia, Argentina	161	
CTT	T. Campbell, AR	14	5	FRF #	R. Fidrich, Hungary	749	75	IVM ¢	V. Ivanov, Russia	104	
CQR	R. Card Jr., NC	15		FAL ¢	A. Filatov, Ukraine	10		IFJ %	F. Ives, New Zealand	81	
CVJ 1	J. Carvajal Martinez, Spain	21	1	F13	R. Fink, NJ	67		JTP *	P. Jacquet, France	541	39
CVR	R. Carver, Australia	178	3	FSJ *	J.-L. Fis, France	91	30	JM	R. James, NM	1102	
CLQ	L. Cason, VA	70		FSE @	S. Foglia, Italy	745		JSI	S. Jenner, England	9	
CGN	G. Cerrutti, Uruguay	73		FFC #	F. Foldesi, Hungary	44	1	JKK \$	K. Jensen, Norway	4	
CNB	N. Cerrutti, Uruguay	72		FMR	M. Fonovich, Rep. of Croatia	3047	703	JLT †	L. Jensen, Denmark	5849	2979
CNT	D. Chantiles, CA	375	1	FT	G. Fortier, Canada	138		JNN	N. Jewell, NC	17	
CMH *	M. Chapelet, France	8	2	FWD	W. Fortune, IA	1		JRJ &	R. Johanns, Netherlands	4225	480
CGF	J. Chaple, MA	6639	2907	FRL	R. Fournier, OH	15		JMR	M. Johns, MO	7	
CJL	J. Charles, MI	46		FML &	M. Fridlund, Netherlands	21		JOG	G. Johnson, MD	190	1
OCR ‡	O. Chretien, Belgium	122		FAA	A. Frosina, Italy	67		JR	R. Johnsson, MD	39	15
CYA	A. Cichy, Poland	32		FMG	G. Fugman, IA	96	1	JON ‡	K. Jonckheere, Belgium	9	1
CLK	W. Clark, MO	95		GMB	M. Gable, OH	121		JRW +	R. Jones, South Africa	325	
CRX	R. Cnota, Poland	1140		GEC	E. Gale, IA	100		JSH	S. Jones, MA	13	

<i>Code</i>	<i>Name</i>	<i>No.</i> <i>Obs.</i>	<i>No.</i> <i>I.S.</i>	<i>Code</i>	<i>Name</i>	<i>No.</i> <i>Obs.</i>	<i>No.</i> <i>I.S.</i>	<i>Code</i>	<i>Name</i>	<i>No.</i> <i>Obs.</i>	<i>No.</i> <i>I.S.</i>
KTR	R. Kaitchuck, IN	1		MPH	J. Manker, GA	180		AST	R. Podesta, Paraguay	9	
KB	W. Kaminski, NM	278	64	MQR	Robert Martin, IL	14		PGG #	G. Posztpisl, Hungary	52	
KAD #	A. Karpati, Hungary	36		MXR	Russell Martin, MD	420		PWR	R. Powaski, OH	20	
KKI	K. Kasai, Switzerland	625		MRX ¶	H. Marx, Germany	1450	155	POX	M. Poxon, England	1324	197
KEI	E. Kato, Australia	34	4	MN	H. Mason, CA	117		PYG	G. Poyner, England	13810	9240
KTL	L. Keith, WI	106		MAQ #	A. Matis, Hungary	4		PFS	F. Pozzi, Italy	8	
KKP &	P. Kerkvliet, Netherlands	21		MAV	D. Matsnev, Russia	259		PGX	G. Pozzi, Italy	164	
KZD #	D. Keszthelyi, Hungary	811		MMZ %	M. Mattiazzo, Australia	138	2	PDO	D. Pray, RI	47	
KMX #	M. Keszthelyi, Hungary	1		MPR ¶	P. Maurer, Germany	514	18	PEF	E. Prosperi, Italy	26	13
KSZ #	S. Keszthelyi, Hungary	5		MGE	G. Mavrofridis, Greece	216		PDQ *	D. Proust, France	38	
KRB	R. King, MN	567	162	MJW	J. Mayer, PA	440	32	PUJ 1	F. Pujol, Spain	262	68
KTO	T. Kinnunen, Finland	3641	2565	MGU	T. McCague, IL	33		PFR #	F. Puskas, Hungary	662	
KGO #	G. Kiss, Hungary	2		MDP	P. McDonald, Canada	524	33	RKE ¶	K. Raetz, Germany	97	
KHN #	H. Kiss, Hungary	4		MGH	H. McGee, England	155	14	RCH *	C. Ramillon, France	530	
KIL #	L. Kiss, Hungary	992	14	MKJ	J. McKenna, NJ	1364	147	RRB	R. Raphael, ME	735	182
KZL #	Z. Kiss, Hungary	5		MK	A. McKown, MD	28		RPE	P. Re, Portugal	4	2
KPE ¶	P. Klix, Germany	91		MIB \$	I. Mediaas, Norway	27		RMX ö	M. Regalado Querol, Spain	7	1
KPL	P. Kneipp, LA	6		MED	K. Medway, England	2012		REP	P. Reinhard, Austria	563	
KGT	G. Knight, ME	74		MFR	F. Melillo, NY	2		RFP	P. Reis Fernandes, Brazil	114	
KSP	S. Knight, ME	59	8	MHI	H. Menali, MA	80		RQ	C. Ricker, MI	148	
KS	J. Knowles, RI	619		MSC +	C. Mesu, Zimbabwe	16		RRZ #	R. Ricza, Hungary	662	
KDL ¶	D. Koehn, Germany	76		MYJ ¶	A. Meyi, Germany	73		OJR 1	J. Ripero Osorio, Spain	1506	454
KHL	M. Kohl, Switzerland	629		MTK	T. Michalik, VA	259		RBA	B. Risman, Canada	2	
KRS	R. Kolman, IL	1552	199	MOK \$	O. Midtskogen, Norway	561	82	RJX #	J. Roca, France	15	
KMA	M. Komorous, Canada	1254	37	MIU	M. Mikutis, IA	60		RMU u	M. Rodriguez Marco, Spain	337	17
KOS	A. Kosa Kiss, Romania	662		MKD	K. Millyard, Canada	41	8	ROE	J. Roe, Mexico	201	
KJF #	J. Koszo, Hungary	67		MZS #	A. Mizser, Hungary	1136	22	RGI	G. Roselli, Italy	8	
KVI #	I. Kovacs, Hungary	303		MCE	E. Mochizuki, Japan	33		ROG	G. Ross, MI	72	38
KTB #	T. Kovacs, Hungary	200		MRV	R. Modic, OH	1204	438	RJQ	J. Rowe, Canada	77	1
KGV #	G. Kovago, Hungary	50		MMI ¶	M. Moeller, Germany	899		RR	R. Royer, CA	454	129
KDE \$	D. Kraakenes, Norway	22		MOL	J. Molnar, VA	1498		RJV	J. Ruiz, Spain	202	
KAW ¶	A. Krawietz, Germany	624		MLF +	B. Monard, South Africa	6119	363	RRP 1	R. Ruiz, Spain	2	
KWO ¶	W. Kriebel, Germany	578	61	MXA ¢	A. Mornil, Ukraine	83		RPH	H. Rumball-Petre, CA	21	
KIS ¶	G. Krisch, Germany	2640		MVR ¢	V. Mornil, Ukraine	1950		SXW	W. Sabo, IL	24	
KRK	K. Krisciunas, WA	30	4	MOW	W. Morrison, Canada	4921	331	SGT #	I. Sagodi, Hungary	390	
KMK	M. Krolik, Poland	158		MYL ¢	Y. Moskalenko, Ukraine	12		SQV 1	J. Sainz Benito, Spain	60	1
KTV	T. Kryachko, Russia	28		MKH	S. Mukherjee, India	51		SJQ	A. Sajtz, Romania	554	
KTZ	T. Krzyt, Poland	263		MMU	M. Munkacsy, RI	678		SSU	S. Sakuma, Japan	450	53
KUC *	S. Kuchto, France	710		MJV	J. Murray, AE	39	4	SQL	R. Salvo, Uruguay	21	
LTO ¶	T. Lange, Germany	1013		MUY ‡	E. Muyllaert, Belgium	2323	363	SAH	G. Samolyk, WI	3235	
LMF	M. Lara, Brazil	576		NZO #	Z. Nagy, Hungary	19		SSD ö	S. Sanchez Jimenez, Spain	15	
LTN	T. Larsen, Norway	2		NAX ¢	A. Naumov, Ukraine	3		SQM 1	J. Sanjuan, Spain	1	
LSK	S. Lascowski, WI	51		NKH	K. Nelson, HI	2		SGX #	G. Santa, Hungary	530	
LJV ^	D. Lasso, Spain	6	6	NRH	R. Nelson, Canada	46	3	STC	G. Santacana, PR	5	
LVA \$	A. Lauvstad, Norway	24		NLB	L. Nemeth, Hungary	56		SYN *	Y. Santens, France	49	
LJC *	J. Lazo-Contreras, France	21		NJO ¶	J. Neumann, Germany	1124		SKI #	K. Sarnecky, Hungary	101	11
LZT	T. Lazuka, IL	878		NPM	P. Norris, MA	19		SGE	G. Sarty, Canada	69	
LEB *	R. Lebert, France	294		OCN	S. O'Connor, Canada	949	181	SDY ¶	D. Scharnhorst, Germany	21	3
LKO ¢	K. Lechman, Ukraine	59		OMA	M. Oefelein, IL	1186		SVK ¢	V. Scherban, Ukraine	50	
LNZ	G. Lenz, CT	335		OES	D. Oesper, IA	1		SXT	T. Schieding, MA	250	
LJL	J. Leonard, IL	93		OJO †	J. Olesen, Denmark	3		SPK ¶	P. Schmeer, Germany	150	7
LMO	M. Lessard, Canada	45		OCV *	C. Olivi, France	16		SQR	R. Schmude Jr., GA	5851	
LEV	A. Leveque, CA	133		OLV *	M. Olivi, France	3		SQA &	A. Scholten, Netherlands	4	
LVY	D. Levy, AZ	2	1	ONJ	J. O'Neill, Ireland	111		SLZ ¶	G. Schott, Germany	30	
LJA ‡	J. Leyssens, Belgium	31		OV	E. Oravec, NY	2719		SHX ¶	H. Schubert, Germany	37	
LIW	W. Liller, Chile	10		OPR	P. Ossowski, Poland	39		SCZ *	E. Schweitzer, France	1080	12
LOB 1	J. Lobo Rodriguez, Spain	6		OSV #	L. Osvald, Hungary	70	2	SBC ¢	B. Scoritchenko, Ukraine	46	
LEQ	E. Lopata, CA	4		OPV #	P. Osvath, Hungary	39		SBQ	B. Scott, CT	203	1
LRD	D. Loring, UT	993		OSE	S. Otero, Argentina	64		SCE	C. Scovil, CT	284	128
LEJ	E. Los, NH	18		OJJ	J. Ott, CO	8		SPB #	P. Sebok, Hungary	26	
LRG ö	M. Losada Menendez, Spain	49		OB +	D. Overbeek, South Africa	14858	18	SFL	F. Sevilla Lobato, Spain	7	
LML x	M. Lou, Spain	1		PLA	A. Padilla Filho, Brazil	722		SDF	D. Shackelford, CA	19	
LMS	M. Loucas, Greece	210		PJY *	J. Paillet, France	4		SHS	S. Sharpe, ME	1389	2
LTB	T. Lubbers, MN	542		PCC @	R. Papini, Italy	8		SSA	A. Sharpless, WA	110	
LBG	G. Lubcke, WI	1		PPS #	S. Papp, Hungary	2735	237	SQN	L. Shaw, CA	1033	439
LPH *	P. Lucaud, France	8		PEX	A. Pearce, Australia	8		SBN	B. Silva, Brazil	565	
LFZ @	F. Lucidi, Italy	3		PN	A. Pearlmutter, MA	56		SNE	N. Simmons, WI	50	3
LKA	K. Luedeke, NM	322		PTI	N. Peattie, CA	139		SWZ	W. Sizensky, NY	72	
LJU	J. Luengo, PA	82		PPB	P. Pecorelli, Argentina	50		SOV \$	O. Skilbrei, Norway	7	
LHU +	H. Lund, South Africa	54	7	PEG *	C. Peguet, France	116		SKU #	J. Skobrak, Hungary	16	
LME	M. Lyons, England	376		PWD	W. Pellerin, TX	37		SDN	D. Slauson, IA	46	
MDW	W. MacDonald II, Canada	283	32	PKT	J. Pickett, AZ	43	11	SLQ	L. Smelcer, Czech Republic	303	
MTX	T. Mackenzie, Canada	39		PYS ‡	Y. Piersman, Belgium	182		SJX +	J. Smit, South Africa	1523	
MQA ¢	Alexandr Maidyk, Ukraine	427		PEY	E. Piggott, AZ	47		SMI	A. Smith, England	5	1
MZA ¢	Anastasia Maidyk, Ukraine	37		PGU	G. Pinazzi, Italy	11		SDZ	D. Smith, AZ	282	
MQN ¢	N. Maidyk, Ukraine	197		PIJ #	J. Piriti, Hungary	399		SHA	H. Smith, MI	12	
MZG ¶	G. Maintz, Germany	379		PPL	P. Plante, OH	82		SJE	J. Smith, CA	276	
MLI	L. Maisler, NY	336	21	PAQ *	A. Pliego-Carmona, France	6		SMQ	M. Smith, AZ	173	4

<i>Code</i>	<i>Name</i>	<i>No.</i> <i>Obs.</i>	<i>No.</i> <i>I.S.</i>	<i>Code</i>	<i>Name</i>	<i>No.</i> <i>Obs.</i>	<i>No.</i> <i>I.S.</i>	<i>Code</i>	<i>Name</i>	<i>No.</i> <i>Obs.</i>	<i>No.</i> <i>I.S.</i>
SXL	M. Solarino, Italy	24		VAN ¶	A. Viertel, Germany	210		WPX	P. Williams, Australia	253	146
SBV #	B. Somosvari, Hungary	4		VMI	M. Vincenzi, Italy	54		WLP ‡	P. Wils, Belgium	73	
SSZ #	Z. Soos, Hungary	314		VII #	I. Vincze, Hungary	28		WSN	T. Wilson, WV	391	134
SOH †	H. Sorensen, Denmark	64		VFK ¶	F. Vohla, Germany	7501	32	WKM	M. Wiskirken, ID	5	
SXC	C. Sousa, MA	50		VOL	W. Vollmann, Austria	209	12	WUL ¶	U. Witt, Germany	189	
SJZ	J. Speil, Poland	1903		WME	M. Wasiuta, VA	127		WTW *	J.-M. Wittwer, Switzerland	19	
SPO \$	J. Spongsveen, Norway	43		WRS	R. Watt, PA	85	1	WJM	J. Wood, CA	333	
SC	C. Spratt, Canada	19	1	WER	R. Weber, KS	40		WBK	B. Worraker, England	6	2
SXR #	M. Sragner, Hungary	2		WEI	D. Weier, WI	490	157	YRK	D. York, NM	1364	843
STR	R. Stanton, CA	316	273	WC	R. Wend, IL	815		YSD	S. Young, MA	101	
SVD	V. Steblina, WA	22	1	WEF	F. West, PA	1152		ZAG #	G. Zajacz, Hungary	51	
SKS	T. Steckner, Canada	4		WTJ	J. West, TX	84	16	ZLT #	T. Zalezsak, Australia	147	1
STF	G. Stefanopoulos, Greece	754		WDM §	M. Westlund, Sweden	278	7	ZHG ¶	H. Zaunick, Germany	293	
STI	P. Steffel, FL	131	9	WSK	S. Westrich, France	15		ZWD	W. Zeilstra, IA	9	
SVR	R. Stencil, CO	94		WPE #	P. Willand, Hungary	215		ZRE	R. Zissell, MA	3302	1125
SAA	A. Stephan, FL	22		WI	D. Williams, IN	819	3	ZPR	P. Zoladek, Poland	6	
SET	C. Stephan, FL	1922	74								
SWT	R. Steward, NJ	1791	415	^	Agrupacia Astronomica Albireo of Seville (Spain)			&	Nederlandse Vereniging Voor Weer-en Sterrenkunde, Werkgroep VeranderlijkeSterren (Netherlands)		
SHZ ¶	H. Struever, Germany	125		ö	Asociacion de Variabilistas de Espagne (Spain)			\$	Norwegian Astronomical Society, Variable Star Section		
SRX %	R. Stubbings, Australia	3616	1584	*	Association Française des Observateurs d'Étoiles Variables (France)			%	Royal Astronomical Society of New Zealand, Variable Star Section		
SQO	R. Stuber, IL	557		+	Astronomical Society of Southern Africa, Variable Star Section			u	Sociedad Astronomica 'Syрма' (Valladolid, Spain)		
SUK	M. Stuka, CA	10		‡	Astronomisk Selskab (Scandinavia)			§	Svensk AmatörAstronomisk Förening, variabelsektionen (Sweden)		
SAC ¶	A. Sturm, Germany	329		¶	Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e.V. (BAV) (Germany)			€	Ukraine Astronomical Group, Variable Star Section		
SUX ö	M. Suarez Tejera, Spain	334		x	Grupo Astronomico Silos (Zaragoza, Spain)			@	Unione Astrofili Italiani (Italy)		
SPP	P. Sullivan, CA	11		‡	Madrid Astronomical Association M1 (Spain)			‡	Vereniging Voor Sterrenkunde, Werkgroep Veranderlijke Sterren (Belgium)		
SXM	M. Surface, IN	2		#	Magyar Csillagászati Egyesület, Valtozócsillag Szakcsoport (Hungary)						
SQC	C. Suslavage, CA	62									
SUS ¶	D. Sussmann, Germany	1650									
SWV	D. Swann, TX	493									
SSW	S. Swierczynski, Poland	2618									
SDX	D. Sworin, CA	450	177								
SGO #	G. Szabo, Hungary	28	1								
SSI #	S. Szabo, Hungary	9	3								
DSZ #	D. Szabolcs, Hungary	12									
SAO #	A. Szauer, Hungary	100									
SLY #	L. Szegedi, Hungary	333									
SXG #	P. Szekvolgyi, Hungary	6									
TDB	D. Taylor, Canada	305	72								
TPV	P. Temple, AZ	3									
TPH	P. Tengg, Austria	32									
TPS #	I. Tepliczky, Hungary	13									
THR	R. Thompson, Canada	664									
THU *	B. Thouet, France	308									
TJN	J. Tilbrook, Australia	11									
TIA #	A. Timar, Hungary	104									
TRL	R. Togni, AR	11									
TOO	J. Toone, England	1									
TST	S. Toothman, IL	42									
TTK #	K. Toth, Hungary	30									
TPT #	P. Toth, Hungary	2									
TOZ #	Z. Toth, Hungary	31	2								
TSC	S. Tracy, CT	511	206								
TRF	C. Trefzger, Switzerland	101	49								
TDM	D. Troiani, IL	43	1								
TRO \$	O. Trondal, Norway	89	13								
TSJ	S. Tsuji, Japan	6									
TUB #	V. Tuboly, Hungary	420									
TUC +	C. Turk, South Africa	161									
TYS	R. Tyson, NY	197									
UND	E. Underhay, CA	68									
UIA	Univ. of Iowa										
	Automated Search, IA	32	11								
VFR *	F. Vaclik, Czech Republic	62									
VLN *	L. Vadrot, France	472									
VAV ‡	S. Vanaverbeke, Belgium	5									
BVE &	E. Van Ballegoy, Aruba	224									
VDL ‡	J. Van Der Looy, Belgium	2578									
VDE &	E. Van Dijk, Netherlands	324	10								
VHD ‡	D. Van Hessche, Belgium	249	12								
VNL ‡	F. Van Loo, Belgium	2197	81								
VMT ‡	T. Vanmunster, Belgium	190	124								
VSJ ‡	J. Vansteelandt, Belgium	4									
VSJ *	S. Vasselle, France	443									
VBE *	B. Vatan, France	113									
VED *	P. Vedrenne, France	6710									
VPE €	P. Veleshchuk, Ukraine	555									
VET *	M. Verdenet, France	2489	1492								

## AAVSO Observer Totals 1997–1998 by Country

<i>Country</i>	<i>No.</i> <i>Observers</i>	<i>No.</i> <i>Obs.</i>	<i>Country</i>	<i>No.</i> <i>Observers</i>	<i>No.</i> <i>Obs.</i>
ARGENTINA	5	1185	JAPAN	4	2110
ARUBA	1	224	MALTA	1	237
AUSTRALIA	10	6871	MEXICO	1	201
AUSTRIA	3	804	NETHERLANDS	9	15224
BELGIUM	19	14529	NEW ZEALAND	1	81
BRAZIL	7	3136	NORWAY	13	5515
CANADA	22	12394	PARAGUAY	1	9
CHILE	1	10	POLAND	9	8179
REP. OF CROATIA	1	3047	PORTUGAL	1	4
CZECH REPUBLIC	2	365	ROMANIA	3	1565
DENMARK	5	5961	RUSSIA	4	392
ENGLAND	13	19282	SOUTH AFRICA	10	24019
FINLAND	1	3641	SPAIN	25	3395
FRANCE	36	18183	SWEDEN	1	278
GERMANY	37	30564	SWITZERLAND	5	3613
GREECE	4	1182	UKRAINE	17	5896
HUNGARY	70	16102	URUGUAY	3	166
INDIA	1	51	USA	206	111419
IRELAND	1	111	ZIMBABWE	1	16
ITALY	16	3100	TOTAL	570	323,061

## AAVSO Observer Totals 1997–1998 USA by State or Territory

<i>State</i>	<i>No.</i> <i>Observers</i>	<i>No.</i> <i>Obs.</i>	<i>State</i>	<i>No.</i> <i>Observers</i>	<i>No.</i> <i>Obs.</i>
ARIZONA (AZ)	10	15614	MINNESOTA (MN)	3	1340
ARKANSAS (AR)	3	1378	MISSOURI (MO)	4	178
ARMED FORCES (AE)	1	39	NEW HAMPSHIRE (NH)	2	21
CALIFORNIA (CA)	21	6455	NEW JERSEY (NJ)	4	3235
COLORADO (CO)	5	3875	NEW MEXICO (NM)	4	3066
CONNECTICUT (CT)	9	2682	NEW YORK (NY)	14	10235
FLORIDA (FL)	6	5462	NORTH CAROLINA (NC)	3	108
GEORGIA (GA)	3	6036	OHIO (OH)	5	1442
HAWAII (HI)	4	441	PENNSYLVANIA (PA)	7	2494
IDAHO (ID)	1	5	PUERTO RICO (PR)	2	52
ILLINOIS (IL)	19	6892	RHODE ISLAND (RI)	4	2149
INDIANA (IN)	8	8708	TEXAS (TX)	6	1002
IOWA (IA)	9	499	UTAH (UT)	1	993
KANSAS (KS)	2	364	VIRGINIA (VA)	6	2060
LOUISIANA (LA)	2	104	WASHINGTON (WA)	3	162
MAINE (ME)	4	2257	WEST VIRGINIA (WV)	1	391
MARYLAND (MD)	7	1485	WISCONSIN (WI)	8	4002
MASSACHUSETTS (MA)	11	15915			
MICHIGAN (MI)	4	278	TOTAL	206	111,419

# “Partners in Astronomy”

## AAVSO/ASP/RASC Meeting in Toronto

### July 1–5, 1999

### Special Symposium July 5–7, 1999

Plan on attending the AAVSO’s 1999 spring meeting in Toronto, Ontario, Canada, which will be a joint meeting with the Astronomical Society of the Pacific (ASP), and the Royal Astronomical Society of Canada (RASC), from Thursday, July 1 to Monday, July 5, 1999. A special additional symposium for professional and amateur astronomers, “Amateur-Professional Partnership in Astronomy Research and Education,” will be held July 5–7.

In addition to the AAVSO Business Meeting and Scientific Paper Session, you can enjoy an outstanding array of other astronomical and social events: tours of the David Dunlap Observatory, the University of Toronto Campus Observatory, and the famous Ontario Science Centre; Universe ’99—two days of exhibits and non-technical lectures on Frontiers of Astronomy; two days of invited and contributed papers on History of Astronomy; a day of RASC-contributed papers; a two-day workshop for teachers; a Family Fair for the kids; a Project ASTRO workshop on creating partnerships between astronomers and teachers; and a gala AAVSO+ASP+RASC Awards Banquet. Following these events, there will be a special three-day symposium on “Amateur Professional Partnership in Astronomical Research and Education.”

More information can be found on the AAVSO web site ([www.aavso.org](http://www.aavso.org)), as well as on the ASP ([www.aspsky.org](http://www.aspsky.org)) and RASC ([www.rasc.ca](http://www.rasc.ca)) sites.

If you have any questions, please contact John R. Percy (current ASP President and Chair of the 1999 AAVSO/ASP/RASC Meeting), Erindale Campus, University of Toronto, Mississauga ON, Canada L5L 1C6; e-mail: [jpercy@erin.utoronto.ca](mailto:jpercy@erin.utoronto.ca).

Persons interested in receiving the official registration packet for this meeting **MUST** either submit the 1999 Spring Meeting form found on the AAVSO website, or return the form below to AAVSO Headquarters, 25 Birch St., Cambridge, MA 02138, USA.

✂-----✂

- Please send me information about the AAVSO/ASP/RASC meeting.
- Please send me information about the July 5–7 symposium.

Name \_\_\_\_\_

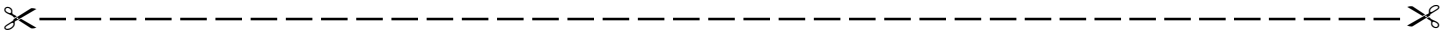
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