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## Eyepiece Views: November, 2005

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E Y E P I E C E V I E W S #311  
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November, 2005

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### 1. INTRODUCTION - Changing Seasons

Fall again! The wonderful smell of freshly brewed coffee together with soothing aroma of hot cider, crisp autumn weather with gorgeous skies for even more extensive observing runs! While we are enjoying the beauties of fall, our fellow observers in the southern hemisphere are starting to warm up for more comfortable summer observing experiences.

As most of you know, fall means something else for the AAVSO, the annual fall meeting. This year it was held in Newton, MA on October 14-15. As part of the AAVSO Fall Meeting this year we conducted a Visual Observing Workshop. We had two sessions; one was devoted to advanced techniques and topics for visual observers while the other concentrated on topics for the new observer and general astronomy public.

For "Meeting Highlights", please visit:

<http://www.aavso.org/aavso/meetings/archivefall05.shtml>

Our current issue is again full of intriguing articles. While the attendees of the fall meeting were able to enjoy the visual observing workshop, people who didn't attend the meeting didn't get the opportunity to appreciate the various talks given during the workshop. In this issue and perhaps the next one as well, you will get to enjoy the talks too! And from the speakers themselves! Stay tuned for more articles of the workshop in our upcoming issue.

We wish you a very enjoyable season with the best dark, clear skies.

Thanks and good observing!

Gamze Menali, AAVSO Technical Assistant (MGQ)

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## **2. AAVSO VISUAL OBSERVING WORKSHOPS, FALL 2005 - Mike Simonsen**

As part of the Fall Meeting of the AAVSO in 2005, two workshops for visual observers were held. The workshop for advanced visual observers took place on Friday morning, October 14th. On Saturday afternoon, October 15th, a workshop for beginning observers and the general public was presented.

I would like to personally thank all the presenters, the AAVSO staff, and Director for making these workshops possible. In the near future, all the talks will be available online for those who were unable to attend, and as a supplement to the many resources for visual observers available on the AAVSO website.

The following is a brief summary of the excellent information that will be made available from these workshops.

From the Advanced Visual Workshop:

### **The Value of Visual Observations- Elizabeth Waagen**

Elizabeth made the case for the continued submission of visual observations to the AAVSO International Database. Several fascinating, new research results gleaned from visual data, such as superhumps detected in an outburst of U Gem, were presented as evidence for the usefulness and integrity of the visual observations in the database.

### **The Eye As Photometer- Michael Linnolt**

Michael, a medical researcher and active variable star observer, presented a very detailed talk on the medical and physiological aspects of how the eye works at the cellular and chemical level. Also covered in great detail was the interaction of the eye and brain. How these properties of the eye-brain relationship affect visual observations was described. Considering the extensive background information provided at the beginning of this talk, more time should have been allotted for the discussion and conclusions. Perhaps another talk to explain the conclusions in greater detail can be made available in the future.

### **Calibrating Your Eyes to the V Magnitude Scale- Sebastian Otero**

Sebastian, the discoverer of Delta Scorpius as a variable star and renowned visual observer of bright variable stars, explained his techniques for making observations of variables to the 0.01 level of precision. Making the most of existing precision photometry and knowing the color indices of the comparison stars in his own sequences is key to his success. One of the most surprising aspects of his observing techniques is his preference for bright, light polluted skies! Good news for observers in urban areas who think they can't contribute to science due to light pollution.

### **Observing Faint Objects from the Heart of England- Gary Poyner**

Gary's talk was not only excellent, but it was an AAVSO first. Gary spoke to us live from Birmingham, England, while Aaron Price advanced the slides of his PowerPoint presentation on cue from Gary. In spite of the potential for technical glitches and disaster, this talk went off smoothly and is an example of how future talks might be given, utilizing 21st century technology. Gary first described the horribly light polluted skies he observes from every day. Both the city-wide light pollution and local street

and security lighting were well demonstrated. Then the importance of quality optics and the maintenance of your equipment were stressed. Finally, several observing techniques for getting the most out of your telescope were covered. Gary, England's most prolific observer, demonstrated that important contributions to science, and observations of very faint objects, can be made by dedicated observers, even from seriously light-polluted cities.

#### **Clinton Ford, an Historical Perspective- Charles Scovil**

Charles, the most influential person in the format and content of AAVSO charts for the last 30 years, provided an historical perspective of Clinton Ford's contribution to the AAVSO as an observer and chart maker. Much of the information presented in this talk is available in the Clint Ford biography, "Some Stars, Some Music", which Chaz made available to participants in the workshop. Many of the anecdotes and personal insights into the personality and contributions of this legendary AAVSO member/observer could only be presented by someone with a personal knowledge and interaction with Clint. Chaz did not disappoint.

#### **Cataclysmic Variables for Visual Observers- Mike Simonsen**

Mike's talk concentrated on the contributions that visual observers can make to cataclysmic variable star research. The crux of the argument is that visual monitoring of CVs is a numbers game. The more CVs one can observe each night, the greater chances for success in detecting outbursts. Sources for building an observing program were discussed, and discussions of which stars represent "significant or noteworthy outbursts" were presented. The AAVSO SNOBs program and the BAAVSS "Recurrent Objects Programme" were presented as examples of lists of CVs of note.

From the Beginning Public Visual Workshop:

#### **Leslie Peltier, an Historical Perspective- David Levy**

David Levy, famous comet discoverer, variable star observer and noted author, gave an inspired talk about Leslie Peltier. Peltier was also a comet discoverer, variable star observer and author, so this talk was a natural for David, who knew Peltier personally. David talked about the golden age of visual observers, and the passion for the night sky, as evidenced in Peltier's famous book, Starlight Nights. Another thing that Levy and Peltier have in common is their love of astronomy and the ability to excite their readership about observing and contributing to science. If you want to understand the love of and motivation for visual observing, this talk should make it clear, even to the uninitiated.

#### **The Value of Visual Observations 2- Elizabeth Waagen**

Elizabeth contributed again to the workshops and presented the case for continued visual observations in a more basic format for the general public. Her message rang out loud and clear, as it did in her first talk.

#### **Binocular Observing of Variable Stars- David Williams**

In spite of reservations expressed to me privately about his expertise, David, the current President of AAVSO, did an outstanding job of explaining the advantages and methods of observing variable stars with binoculars. Basic information about the types, aperture, magnification and potential targets for observation were presented in a logical and engaging format. He also presented honest evaluation of different types of parallelogram mounts available commercially. It was a great satisfaction to me to see that our President is not only an expert observer, but an engaging speaker who can reach out to the public at large.

#### **Gene's Rules of Observing Variable Stars- Gene Hanson**

I was fortunate to be mentored by Gene when I began observing, so I was familiar with Gene's Rules and the logic and humor included in them. Many of

the subtleties of observing faint objects and the rules for not letting 'bias' spoil the validity of your observations are highlights of this talk. But, the real highlight is Gene himself, who is capable of inspiring the newbie and reminding even the most hard-core of us why we observe variable stars...because it is fun!

#### **AAVSO Tools and Resources for Observers- Glenn Chapel**

Glenn is a monthly columnist for Astronomy magazine and long time observer for the AAVSO. His column highlights tips and advice for novice observers. But, like the best jazz performances, the true experience is seeing Glenn do his thing in the flesh, live. One of the live highlights of this talk was Glenn posting an observation to WebObs on the AAVSO website, explaining how it is done, and then later showing his observation posted in the Quick Look data and the Light Curve Generator. Glenn's insight into how things used to be and the way they are now, as regards submitting observations, and the feedback and satisfaction gleaned, was very enlightening. His personal style, humor and delivery will make this an AAVSO classic in the archives of talks given by expert observers. Highly recommended to all, regardless your expertise.

#### **Life After Messier- Mike Simonsen**

Simonsen began by outlining the typical progression, or evolution, of amateur astronomers, from bright objects to the Messier catalog. An alternative evolutionary track to chasing down ever fainter and more obscure deep sky objects was presented. Mike showed there are numerous variables that can be star-hopped to using some of the brighter, better known Messier objects. The variables discussed were mostly easy to observe objects that can be followed through their entire range of activity with a modest sized telescope or binoculars.

#### **Toward the Future- Arne Henden, AAVSO Director**

Doctor Henden provided a closing talk about the potential for observers to use robotic telescopes and data-mine existing data in the AAVSO International Database and other data sources. Many of the future observers of the AAVSO will not spend hours at the eyepiece in the cold of night, and Dr. Henden demonstrated that there is a place for this 'next generation' of observers in the future of AAVSO.

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### **3. GENE'S LAWS OF OBSERVING VARIABLE STARS - Gene Hanson**

The so-called "laws" of observing variable stars came out of correspondence with new observer Lance Shaw who had found my email and asked about his first variable star observations made just the night before. Over the next year and hundreds of emails and phone calls, I was essentially his mentor and many of these "laws" came from problems he encountered. It was Lance who coined them Gene's Laws and over time more were added as observing problems presented themselves. Consequently, the list is probably far from comprehensive. And for those of you disagreeing with some of these laws, be advised these are more like "guidelines" than actual rules! ;-)

Rule 1: Report exactly what you see and don't worry about it, ever.

Variation: Report what you see, not what you think you should be seeing.

In Lance's very first email, he was very excited about his making his first 3 estimates in several hours and was very uncertain about them and wondered if they any good? This was before the days when there was a quick-look file so his best bet was to ask a more experienced observer.

Rule 2: Take extreme care when making the field and variable identification.

This is the number one cause for blowing an observation.

Rule 3: Bias is your enemy. Avoid it. (See rule 1)

Since bias may be impossible to avoid entirely, here are some tips. If someone tells you where a star is at, assume they are either 1) lying 2) a bad observer so their opinion is worthless, or 3) completely crazy (which encompasses the entire VSOing community. Sometimes the bias is your own. If you've observed a given star recently and can recall what the last estimate was, that observation must have been made by your evil twin. Therefore, you should assume 1) they were lying 2) they are a bad observer (and you should know), or 3) you are obviously schizophrenic-- you are in fact crazy!

Rule 4: You never know what a variable is going to do.

Corollary: You can never be certain where a variable is supposed to be an any given time.

This rule should be added to the reasons why bias should be avoided.

Rule 5: Stars become easier to estimate (and accuracy therefore increases) as the stars appear dimmer.

It is often said to only use as much optical aid as necessary to just comfortable see the variable and the comparison stars. But there is too much of a good thing. Accuracy will decrease if you get close to your optical limit. To limit the apparent brightness, two techniques are to use an aperture mask or the out-of-focus method.

Rule 6: Make every estimate as if you are the only observer in the world.

You may not have pretend, either! Since the number of VSOers worldwide is so small, this is often the case! Another way of stating this would be: Make every estimate as if you're the only observer looking at this star at this time. You might add the following: Try to make estimates of stars that no one else is observing.

Rule 7: If a comparison star seems inconsistent, avoid using it if possible!

Rule 8: Take extreme care when estimating near a charts limit because of misidentification trouble. If a higher letter chart is available, use it!

Rule 9: Avoid doing Miras in moonlight.

In fact it not a bad idea to avoid doing any type of variable in strong moonlight if you are a beginner as it makes things like finding stars very difficult and can lead to frustration. Starting a variable star program is difficult enough!

Rule 10: Avoid prolonged stares at reddish stars.

Any new observer needs to try this just once to convince you how much a star will brighten before your eyes.

Rule 11: Try for redundancy in recording.

Use double-date and julian date Use star name and designation Record your estimate as a magnitude and a fraction. For example: 10.7 and 100|7|V|3|110

Rule 12: Record/report your observations like they mean something.

- 1) Because they do!!!!
- 2) Double/triple check your reports before sending them to HQ.
- 3) Record all your observations.
- 4) Be consistent in your dates / times. If you decide to use local time (or UT or GMAT), stick with it.

Rule 13: If you are uncertain about an estimate for any reason, put a colon behind the estimate, explaining why you are uncertain, then see rule 1.

Okay, we'll readily admit that ALL observations are probably uncertain, but it is obviously a matter of degree. Let's just say, more uncertainty than usual.

Rule 14: You can learn a lot by understanding the AAVSO standard observer uncertainty codes.

B sky is bright, twilight, light pollution, aurorae  
F unconventional method (out of focus, visual photometer, etc.)  
H haze, mist, fog  
I identification of star is uncertain  
J Hipparcos magnitudes used in sequence  
K non AAVSO chart or sequence used;  
L low in sky, horizon, trees, obstruction  
M moon present or interferes  
N Angle, position angle  
R color comment (star is red, blue, etc.)  
S comparison sequence comment or problem; extrapolation;  
note: do not use for non AAVSO sequence  
U clouds  
V faint star, glimpse, near limit  
W weather (includes wind), poor seeing in general  
Y activity in star outburst, fading, flare, unusual behavior  
Z possibly erroneous, doubtful, observer fatigue  
O "other" comment MUST be explained in Explanation field  
also use the "O" code if you wish to enter one of the following expanded multi letter codes:

Rule 15: Whenever possible, use a standard chart with a standard sequence.

A AAVSO Atlas  
G Guide Star Catalogue magnitudes used in sequence  
J Hipparcos magnitudes used in sequence  
K non AAVSO chart or sequence used  
T TYCHO magnitudes used in sequence

As I stated up front, the list is far from complete. If there was just one more I add for the beginning variable star observer, it would be, "Get a mentor!"

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#### 4. THE FUN OF ECLIPSING BINARY STAR OBSERVING - Chris Stephan

I have been observing variable stars since March of 1973. Long period and semi-regular stars are nice to fall back on, but the fun ones to me are eclipsing binary stars. All the action takes place in a matter of hours, instead of weeks to months. I can use one telescope, or all three of my telescopes during an observing run. If I see three or more stars predicted to be in eclipse during the same time period, I bring out my portable telescopes and set them up near my permanently mounted 14.25" reflecting

telescope. I can set a telescope on a star, and then make the rounds around the telescopes, making an observation every ten minutes per star.

My portable telescopes are a 10" Dobsonian reflector, and a 4.7" refractor. I also have 10X50 and 15X70 binoculars available for brighter stars, such as RZ Cas, W UMa, or R CMa. I keep all my eclipsing binary star charts in separate notebooks, and the reversed charts for my refractor in another notebook. I have all the AAVSO eclipsing binary charts printed off, along with many others that I have accumulated over the years on projects with Marv Baldwin and others. AAVSO Headquarters publishes predictions for eclipsing binary stars each year. A really like the predictions on the Milwaukee Astronomical Society web site, which covers many more stars than on the AAVSO predictions.

I try to observe stars that go through their entire eclipse in three to four hours. There are many of these, and they are very convenient for an observing session. I observe a mixture of the three types of eclipsers; the Algol type, the W UMa type, and the Beta Lyr type.

I am strictly a visual observer, and there are lots of stars for me to observe. The ccd folks have a great number of stars to observe, also. Many of these are dimmer, or have a much smaller magnitude range.

Some of my favorite stars are: OO Aql, EG Cep, ZZ Cyg, ER Ori, YY Eri, X Tri, V Tri, RZ Cas, SW Lac, and AZ Vir. These are easy to find, and give nice light curves. One of the funnest ones is X Tri. It is quite fast and when it goes into eclipse, you know it immediately. It goes down to minimum in 1- 1.5 hours and immediately comes back up. It shows a beautiful "V" shaped light curve.

RZ Cas is another one. It is a binocular star, and ranges from about 6.3 magnitude to 7.8 magnitude. It takes about 4 hours to go through an eclipse and give a nicely shaped light curve.

Another advantage with eclipsing binary star observing is that you can really add to your number of magnitude estimates quickly, not that that should be your main focus. If I am doing 4 stars in one night, and make an estimate of each every 10 minutes, and make about 20 estimates for each, I can get approximately 80 estimates or in a 3 to 4 hour period. That adds up.

I am actually surprised that more visual observers do not observe eclipsing binary stars. Actually, the number of AAVSO observers who concentrate on these is fairly small. We could really use more eclipser observers. If you are interested, contact Marv Baldwin, the chairman of the Eclipsing Binary Star Committee. I'd like to really encourage more of you visual observers to try your hand at eclipsing binary stars. I think you will find them quite enjoyable.

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## 5. VISUAL OBSERVING FROM MY SEA OF DISTRACTIONS - Dan Taylor

The clock will not be denied as the minutes remaining are passing rapidly, and one last observation is quickly sought out. An owl hoots in the distance, offering yet another gentle reminder that observing time in my bucolic haven must end. As a night shift toolmaker, at a local auto plant, my hour of curfew is 10 pm. With haste the eyepieces, charts, pens, and all the substance of a typical observing session are stored, ready for the next outing. The scope too must be ready for the next foray under clear skies. The twenty inch dob commands patience as it is rolled into its hut, sheathed in weather coated aspenite, some may dare to compare this monolith to an

outhouse of Bunyan proportions.

Kahlil Gibran in 'The Prophet' dictated that a house is your outer skin "... your larger body"; I like to think that my scope is nothing more than an augmentation of my eyes. A tool, dedicated to serving to sate the curiosity of this observer.

Most must find their observing program a source of supreme enjoyment, unencumbered with mean intrusions and perhaps with the lofty goal of being unshackled from the mundane. Moreover, by relishing the unfurling of each facet in their routine, freedom for a time is won from the conventions of daily life. So how did I come to embrace and endure this needful and decidedly non tranquil end of session dash? It is part of my story and how in this instance, variable star observing is accomplished and peace is made with my daily ritual.

As a young married couple in the mid eighties, Carol my wife, and I secured a home in a pleasant section of Windsor Ontario Canada. As we all know urban observing sets its own limitations. It is ruled chiefly by the veil of urban gossamer set aloft by light pollution. Then, as an active observer with honkin' huge Coulter Odyssey, (a thirteen incher, some may recall) cannot subsist on deep sky dross in such an environment. Alternatives were examined. Planets are great urban quests, yet if only they could be counted on to be convenient. Double stars were pondered in vain too.

Now about this time, that is January 1987, S&T printed their quasi-periodic homage to Mira. With interest roused, I followed the article's formula for observing this star. In short order I held in my hands, before my eyes the exasperating and highly contagion results in just a few weeks of observing. The darn thing was alive! It was at that moment I caught something, and have enjoyed every minute suffering it since. It would be most accurate to say that my involvement in variable stars came about due to the confines of urban living.

Some of my most pleasant hours doing variables took place in the Walkerville back yard. Occasionally, I would stretch the night till three am, content in the serenity of the sky overhead collecting typically perhaps a dozen observations. In all the years there I don't believe more than fifteen observation were seen in one session. Urban living however, has its limits for the variable star observer and that was something that was eventually going to be reconciled with.

This curious illness took on many troubling aspects. As a fever should be fed, I fed it a new scope. Brashly, it was patterned after a 1989 magazine article by a fellow named Dave Kreige, the primary, of the twenty inch class, was purchased from Galaxy Optics, the tube assembly erected at home with the aid of one of General Motor's most distracted toolmakers.

Every urban astronomer pines after rural observing, and as a moment apart from the usual drudge, the spangle of new and unrecognizable star patterns is beheld as a coveted ideal. I was quite familiar with this aspect of rural life; both Mom and Dad grew up on the farm, most of my family still lives there. As a youth I would tote my department store refractor to my grandparent's farm and observe and make notes from the wonderful skies they lived under. Carol was entirely a product of the city. However, given time, and through an inexplicable process, the notion of country living gained currency in both our lives.

It was our good fortune to find a home in the country some half hour out of Windsor part way to renown birding sanctuary Point Pelee Ontario. This find was not a simple labor though. Many years were spent searching for just the right mix- old farm house for atmosphere and economy, room for gardening as

this is Carol's pursuit and one I most eagerly encouraged, and such particulars as a mail box on the near side of the road. Fitting the bill was not easy and I didn't mention one need I naturally harbored; freedom from expansive sky glow. Carol understood. The search ended in 1993.

Of our 'farm home' many I'm sure thought of as a hovel, simultaneously thinking we had set aside sane thinking. It did lack many modern accoutrements, to say it was a throw back to olden times would be reasonable. I will never forget our thoughts and sensations of our first night in our hovel trying to gain sleep at the foot of an antiquated coal oil heater. We were blind to that present and saw only the future. Today I can say it has been worth every renovation trial. We in for a challenge of the likes we had never experienced nor thought possible.

That slight strain on observing time became a tourniquet that at times threatened to all but eliminate my sanity and astronomy time too. Oh yeah, we were also blessed with two more children. I had changed employers about the time we moved as I now helped Chrysler Motors tooling its minivan operation. The time compression in our lives led me to take on the midnight shift as it afforded the best route to keep my wits and survive demands in our busy home. From that day to this, with a few respites, I have maintained the midnight vigil from the steel girders of the mini van factory. Meanwhile renovation labors would continue for another six or seven years. Indeed, observing time was precious.

A variable star observer needs variables and ready access to them. For the most, part naked eye and binocular variables were the necessary selections on those dear nights. There was simply no time to roll out the scope, besides I usually retained the residue of some home renovation gunk that could readily contaminate the scope.

Each night, though with what time was available, I surveyed MY country heavens overhead. Oh what inner peace is found when an ideal is witnessed in the now. The skies were glorious, the Milky Way stretched across a shameful length of sky. On those moisture free nights it nearly scraped the southern horizon. The grand skies of my grandparents that I savored in my youth were now mine. In reality, most assuredly, these skies fall well short of decent dark skies, but even today occasional glimpses of sixth magnitude plus stars can be seen.

Once we emerged from the gotta-be-done-to-survive phase of repairs, I found more time for observing. This would evolve into the current state of my observing program. The late nineties as many of you know, began the chart revolution we are witnesses to today. Chaz kicked out some of the best charts then seen using a computer to plot the fields. Incorporated on these charts were some significantly deep comparison stars. Some were 15th magnitude and better. I was curious just how faint I could see with this twenty incher. So thus began a quest that I still pursue with fascination today. The best I could do then was about fifteen five. There was much to learn of yet untried methods that now allow me to reach deeper by almost a magnitude or more.

I incorporate several techniques simultaneously when probing the limits of scope and observing site. Some basic rules are of course in order. Well rested, no booze, and plenty of liquids are essential. Obviously averted vision is used. The highest magnification that is still comfortable is also crucial. For most ordinary observations I use about 300x. Occasionally if a star is suspected, perhaps just glimpsed at, I can confirm it with higher power at 500x. The caveat here is usually seeing which often nullifies the advantage of magnification. We all have a sweet spot on our retinas usually located just a few field degrees to the left and below centre (for right eye dominant observers). I submit to this need by placing the subject star

to the left hand side of the field if possible.

I find it is not just banking air that can ferret out a stellar glimpse but it occurs DURING inhalation which I try to stretch for as many seconds as possible. For open air visual observers, like me, the method that far and away generates the most yield is a monk's hood which serves to shield out all stray light.

For many years I was a variable star observing island unto myself. The sole means of contact came through the mail in the form of 'Alert Notices'. Although, I suppose conversely, the only scrap the AAVSO knew of me was the string of monthly reports I mailed to them. Undoubtedly I was on the receiving end of a bargain. The internet has sired a direct mercurial descendant in the online 'Alert Notice' format. In this day of nearly instant news it is quaint to think that we used to find out about variable star events four or five days after it occurred. The most rewarding part of being an AAVSO member today however, had to await the advent of two marvels: the home computer and the internet.

One of the most enjoyable aspects of variable star observing is getting to know fellow variable star observers. This is a natural consequence of the wonder of the internet. Through it I have joined two AAVSO working groups, the chartteam and the compstar data base team. I have discovered that chart making is necessarily dynamic and shortly these two groups will meld into one, a natural consequence and most appropriate. The work is most satisfying and I would recommend it to anyone. But the tasks are only a small part, getting to know and learn from these intelligent, intriguing people are the very best parts. In addition, the folks at AAVSO HQ, have earned my most sincere thanks for their conscientious, patient, and thorough handling of the creative problems I have thrust upon them.

Tomorrow if it is clear, I will open up the shed, roll the scope out and assemble all the necessary gear in preparation for another chance to visit briefly with some old companions and continue the challenge of peeking in on some yet unknown but welcome starry visitors. Then as I submit to the needful duty, commence anew the cycle of my day.

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**Good observing!**

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