

Eyepiece Views: July, 2002

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E Y E P I E C E V I E W S

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1. HAPPY BIRTHDAY EYEPIECE VIEWS!

Now that the spring meeting has come and gone, you realize how fast time flies. The 91st Spring Meeting was a great success as mentioned by several people during and after the meeting. There were even some suggestions that the AAVSO should hold all the future meetings in Hawai'i. Well... we are not sure if this is possible, however, that is one of the best suggestions we received!

Here's another event that makes you think about the speed with which the earth makes one complete revolution around the sun: It is Eyepiece Views' first anniversary. With this issue we are leaving our first year of publication behind. We hope that you enjoyed the articles published and information given here, utilized data in your observations and had a very thriving year as well.

This issue also stands out for the guest authors it welcomes. We expect that you'll enjoy the articles by the established comet discoverer and author David H. Levy, our valuable observers Steve Robinson and Steve O'Connor. It was a great pleasure to prepare the articles for publication. We think it will be as much delightful while reading them as you hold your breath.

With our best wishes for our readers and observers around the world in the coming months!

Thanks and good observing!

Gamze Menali, AAVSO Technical Assistant (MGQ)

Aaron Price, AAVSO Technical Assistant (PAH)
Mike Simonsen, AAVSO Observer (SXN)

2. TOMBAUGH'S STAR: A VARIABLE STAR ADVENTURE - David H. Levy

On the clear evening of May 29, I set up my telescope for my regular observing program which includes a cataclysmic variable in Corvus named TV Corvi. The star was in outburst- a rare event for a star that normally is barely visible even through the Palomar 48-inch Schmidt- and I'm lucky if I see it once a year. This star is special to me, for it comes with a story.

In 1985, I began interviewing Clyde Tombaugh in preparation for writing his biography. The process was a long one, taking years to get the story of his life and discoveries. Of course, I had to verify the discoveries he claimed to have made, including a globular cluster, five open clusters, a supercluster of galaxies, a comet, many asteroids, and one trans-Neptunian planet called Pluto. One afternoon in 1986, while in the basement archives at Lowell Observatory, I went through hundreds of paper envelopes that Clyde used to store his photographic plates. Yellowing with age, these envelopes had been replaced recently with modern archival envelopes, but the originals are still stored in a filing cabinet. They were crammed with information relating to the hundreds of hour-long photographs he took during his fourteen-year search of the sky, including data on anything new he found while scanning each pair of plates through the blink microscope.

After a few hours of searching, I found an interesting entry on a plate taken on March 23, 1931: "One nova suspect, 'T 12', near southwest corner of plate, magnitude about 12... No trace of object on plates of March 20 or 17, 1931... Evidently a very remarkable star to rise from 17 or fainter to 12 in 2 days time. This object was discovered on May 25, 1932, at 11:00 AM."

This brief note about a nova in Corvus sent me hurrying to the plate vault with Brian Skiff, an observer at Lowell. We found the plates and the nova, and when we checked the position on the Palomar Observatory Sky Survey, we realized that at its faintest, the star was probably about 20th magnitude, which meant that in outburst it underwent at least a seven magnitude increase in brightness. When I asked Clyde about it, he replied that in the spring of 1932 he was busy preparing to leave for University, but that he did report it to his superiors at Lowell. Evidently they did not follow up on the discovery, and it was never reported officially. I decided to do something about it. At the next opportunity I traveled to the Harvard College Observatory plate stacks in Cambridge, Massachusetts, to attempt to confirm the nova. I found a patrol plate they had taken at the same place, near the same time, but the nova wasn't there. Depressed at the prospect of having spent a lot of time traveling for nothing, I thought about what to do. The first thing was to examine the other plates from different times. I found 12 such plates covering periods from 1931 almost to the present. As expected, nothing unusual appeared. On each plate I looked for the familiar pattern of the Corvus field and then at the exact position of the star. Then, I set up the 10th plate, exposed in the late 1970s, many years after the original discovery. I focused in on the right area, and was surprised to see the star as bright as it was in 1931. With mounting excitement I decided to check every one of the more than 360 patrol plates of Corvus in the Harvard collection. After three days of searching I found evidence of nine additional outbursts. In all likelihood, this star was not a classical nova, but a "dwarf nova" or

repeating cataclysmic variable.

Armed with this evidence, I walked over to Brian Marsden's office in the next building. The Director of the Central Bureau for Astronomical Telegrams, Marsden has responsibility for announcing new discoveries. I showed him the evidence, but he agreed to make an announcement only after I was able to see the star in outburst. That fall, when Corvus starting rising over the southeastern horizon, I began a series of observations. Night after night I observed the position of that star. Each time I looked through the telescope, I could see the surrounding stars, but no sign whatever of the interloper. Everything was ready for the discovery -I even had made arrangements with Gary Rosenbaum, a friend at the Steward Observatory on Kitt Peak, to use a telescope there to observe in the nova once it erupted. For almost 70 nights I looked, until the night of March 23 1990. By this time Corvus was rising early in the evening, so I didn't have to wait too long before I pointed the telescope toward the proper field. But when I did, I gasped: There, right before my eyes, I could see the star Clyde had found exactly 59 years to the day before me. It was a wonderful feeling. I telephoned Gary, who arranged for one of the big scopes on Kitt Peak to obtain a spectrum of the star that very night.

When Tombaugh's star went into outburst again 15 months later, I had just discovered Periodic comet Levy. On any ordinary night either one or the other event would have occupied all my attention, but having both events take place simultaneously was quite an experience. Discovering a comet and then learning that my favorite variable was in outburst made this a truly memorable time. The next day, I learned that the International Ultraviolet Explorer spacecraft was observing it for several hours! That topped it for me: Taking the star off an old photographic plate and having it studied by spacecraft was truly an unforgettable event.

TV Corvi appears to be a most unusual binary star system. It is a high galactic latitude dwarf nova type cataclysmic variable star, itself unusual since most such stars are at low galactic latitudes; i.e. near the plane of the Milky Way.

Clyde Tombaugh was delighted when I told him of the possible astrophysics regarding the star system he discovered so long ago. And I think of our long friendship whenever I turn the telescope toward Corvus to see just how his star is doing. The dates of Clyde's first observation in 1931 and my first visual observation in 1990, March 23, have become unique for me: On March 23, 1993, Gene and Carolyn Shoemaker and I took the photographs that led to our discovery of Comet Shoemaker-Levy 9, our best known comet find. Four years later, on March 23, 1997, Wendee and I were married in an event that included a lunar eclipse. It was therefore a surprise and a pleasure to be observing with Wendee on March 23, 2000, and see TV Corvi in outburst once again, as if to help celebrate our anniversary.

Of all of my astronomical experiences, the tale of TV Corvi is one of the most satisfying for two reasons. First, I have had a lifelong interest in variable stars, and my work with this particular star made the field of variable stars a deeply personal one for me. Second, it helped to cement my deep friendship with Clyde Tombaugh, a person I have always admired and who I miss very much. When I saw Tombaugh's star in outburst last May, it reminded me both of that friendship and of how astronomical stories can take many turns.

(A portion of this article is reprinted from David Levy's Guide to the

Night Sky, recently published by Cambridge University Press).

3. FULL CIRCLE - Steve O'Connor

The summer of 2002 marks the 30th anniversary of my first season of observing variable stars. Amazing how time has flown ! I look forward to trying for another 30 years under the magic dome of night replete with those pulsating, outbursting, eclipsing objects of our desire.

My lifelong passion with variable stars began rather unceremoniously at the age of fourteen with a random encounter between myself and a neighbor's trash can ! Although I will assure you that the inspection of waste bins had not been (and still isn't !) a habit of mine, one fine morning back in the autumn of 1970, a small, tattered, coverless booklet describing amateur astronomy, lying atop a heap of refuse, caught my eye as I happened by. Amid the concise, illustrated sections that seemed to deal with every type of object in the sky, and how everyday persons, with modest optical aid could observe and enjoy them was a 'chapter' on variable stars -- the rest, as they say, is history !

What struck me most was the revelation that the sky was populated 'wall to wall' with stars whose visual brightness actually changed, often dramatically, over periods of time comprehensible to a youngster and that it would be possible for me to see some of these impressive goings-on with no more than a very small telescope or a pair of modestly sized binoculars, and that these 'observations' could be undertaken from a vantage point no more extravagant or difficult to reach than the small lawn that bordered dad's tomato patch ! My tattered booklet made mention of the AAVSO and its intimate history with the observation of and collection of data on variable stars (the now long defunct Brattle St. address of AAVSO bearing testament to my booklet's advanced age !). This, I thought, would be the place where I could direct my inquiries and report any observations I might make.

After some initial awkwardness, which included (shhhhh ...) mistaking the 'Teapot' of Sagittarius for Ursa Major's 'Big Dipper', I learned to locate the constellations visible from the driveway and backyard. Then came 7x35mm binoculars and a 50mm refractor on a tabletop tripod. The latter instrument, although providing me with memorable first views of the bright planets and the Moon, proved very difficult to work with when trying to locate fainter stars. Not to be discouraged, I convinced my mom to purchase, from a local department store, a 60mm refractor with finderscope, full length tripod and interchangeable eyepieces. This modest instrument proved to be a formidable observing aid for tracking down variable stars. Now, amongst the tiny diagrams of light curves and short lists of variables of different types that appeared in my booklet, were several tiny reproductions of AAVSO star charts including one for the RR Lyr type variable XZ Cygni ... so as a 14 year old in the early summer of 1971, trusty mini-chart in hand, I pointed my 60mm 'scope in the direction of this short period pulsator and searched until I had located the correct field and identified XZ Cygni. I then proceeded to spend almost the entire night marvelling at this variable's hour by hour changes in brightness --- I was AMAZED !! Other practice sessions followed with T Cephei, Delta Cephei, and others. The following year I wrote to AAVSO Headquarters and expressed my desire to join the organization as an observer. My 'starter kit', including a warm welcoming letter by then Director Mrs. M. Mayall, arrived a few weeks later --- WOW !! --- how I gawked at the attractive full sized 'blueprinted' charts that

included ones for R Scuti and AF Cygni, two of the first variables I officially observed for the Association. The 60mm continued to see duty into the late 1970's. This wee telescope was retired after approximately five years of use when, on one bitterly cold winter night, one of it's tripod legs literally snapped off ! Several thousand estimates were made with this little 'scope before the end came --- superb value for the dollar !

An 8" newtonian became my main instrument in 1976 --- what a tremendous thrill it was to be able to observe SS Cygni, even at minimum light ! I went into temporary retirement from active observing in the early 1980's but continued to keep up to date with the goings on of many of the more unusual stars in the AAVSO program through the pages of the now discontinued AAVSO Circular. In 1989 I resumed active observing, still with my 8" reflector, with which, by 1996, I had starhopped my way through several thousand more observations and met the acquaintance of many more interesting variables. In the summer of 1996 I acquired a 12" SCT. Visual observations were carried out with the 12" until the following year when I dove into the amazing, sometimes frustrating world of the CCD imaging of variable star fields. From 1997 until the summer of 2001, enormous amounts of time were spent learning how to maximize the capabilities of my SCT/CCD system (given a couple of rather severe restraints imposed by my observing site) and making hundreds more observations of variable stars along the way, many of which would have been impossible for me to make had I been using the telescope visually.

Long hours at the telescope and the computer, coupled with my rather demanding day job working as an orderly at a long term care facility for the elderly began taking their toll on me. My desire for variable star observing was never greater however I was growing gradually tired. I felt my combined activities and responsibilities were wearing me down. Passionate but tired as the summer of 2001 progressed, I sensed I needed to make some changes --- then came the horrific events of the 11th of September --- and through such immense tragedy I came to a full stop, thinking long and hard about my own priorities --- realizing I needed to take time to 'smell the roses' as it were --- and I have done that. I took the remainder of 2001 off, got more rest, attended the wonderfully friendly AAVSO Fall Meeting in Somerville, MA, and just generally revitalized myself. In February of 2002, I met and fell in love with my now fiance, Jeneba. Life has never been better !!

I always knew I would someday restart my observing program in a form that would be more 'user friendly' --- and that's exactly what's happened ! Since the beginning of 2002, my observing sessions have been fewer but extremely rewarding --- FUN !! I've acquired a pair of 20x80mm binoculars and on this 30th anniversary of my observing career, am having a ball revisiting and observing many old binocular/small telescope favorites, many of which I haven't seen since I was a teenager, head cocked skyward, eyes full of wonder, out beside dad's tomato patch.

Many of the variable stars I started with during my first summer of vso'ing back in '72 are, of course, again well placed for observation from mid-northern climes as this issue of Eyepiece Views reaches you. I've listed some of them I now have on my 50mm and 80mm binocular programs below along with a few notes and I want to encourage observers with binoculars or small telescopes, especially new observers, or those thinking of commencing observations, to go ahead and give one or more of these a try. Variable star observing can be an exciting and highly rewarding experience of real

scientific value no matter what size of instrument one uses. Despite the fact that these stars have been observed for a number of decades, the AAVSO continues to require carefully made observations on all of them.

1315+46 V CVN (Type: SRa) -- During the past 1000 days the variations have been continuous, the mean range from v magnitude 7.0 - 7.9. There is sometimes a pronounced hump on the ascending branch of the light curve which may last as long as 100 days. Three well defined minima of about equal depth, occurring with an average period of about 192 days are evident in the recent (1000 day) light curve. As of late June 2002 this red giant had faded to mean magnitude 7.3 from the most recent maximum of about magnitude 6.8. A good target for observers using binoculars that are able to reach the 7th or 8th magnitude.

1432+27 R Boo (Type: Mira) -- This pulsating red giant has an average cycle length near 225 days. An inspection of the last 1000 day light curve shows 4 maxima, all reaching the 7th magnitude, and thus observable with binoculars. Recent minima of this star have ranged between visual magnitudes 12.0 and 12.9 thus requiring a moderately large telescope for effective observation under moderately light polluted sites. However, observers with telescopes as small as a 60mm refractor can follow this variable as it rises above magnitude 10.0 or so. In the AAVSO Bulletin 65, R Boo is predicted to reach minimum around mid-July, with the next maximum scheduled for the end of October.

1544+28A R CrB (Type: RCB) -- The prototype of a rare class of variable, characterized by long periods of nearly constant light maximum interrupted at irregular intervals by rapid light decreases of usually between 1 and 8 visual magnitudes which last from several days to many months. R CrB, when at or near maximum, is a perfect target for observers with 50mm binoculars. Small telescope users will be able to follow, down to about 10th or 11th magnitude, the fascinating, sometimes rapidly evolving minima, two of which are evident in the light curve of this variable over the last 1000 days. Larger telescopes are required to follow this amazing object down to full minimum, which may approach magnitude 15.

1559+47 X Her -- This semi-regular red giant is a great target for observers using binoculars. An inspection of the most recent 1000 day light curve of this star shows it has been continually variable over a mean range of about 6.2 - 7.2 v with maxima occurring at intervals of between 100 - 200 days.

1632+66 R Dra -- This Mira-type long period variable, one of the first variables I ever observed, has been ranging between visual magnitudes 7 and 12 over the past 1000 days. The four most recent maxima have all been between 7.5 - 7.7v, making R Draconis observable with higher power binoculars when near maximum. Observers with small telescopes can follow this star during the summer as it fades towards its' predicted 12th magnitude minimum expected to occur near Sept.22,2002.

1842-05 R Sct -- Probably the best known example of a class of supergiant pulsating variables known as RV Tauri stars, characterized by mid to late type spectra, (sometimes) alternating deep and shallow minima, and (sometimes) long, slow periodic waves superimposed upon the primary variation. Over the past 3 years, R Scuti's mean range has been from about 5.2 - 7.0v, making it an excellent variable to observe with binoculars. In

early June of this year R Sct passed through one of its' deeper minima, reaching a mean magnitude of around 6.7v. This famous star spends a great deal of its' time varying near 5.5v as it goes through it's paces with an average cycle length of near 145 days.

1927+45 AF Cyg -- This red semi-regular giant has displayed a mean visual range of about 6.8 - 7.8 during the past 1000 days with maxima occurring at intervals of between 75 - 100 days. The variations have been continual and as of mid-June AF Cygni was in the process of fading from a recent maximum of near 6.8v. Interestingly, I recently came across some published light curves of this star from the 1930's where the variations seem completely different from what we are seeing presently -- certainly a wonderful reminder that even variables with long term light curves need further observation in order to fully document these impressive changes of behavior. AF Cygni is a wonderful summer target for observers using binoculars or small telescopes.

2009+38 RS Cyg -- This SRa-type red giant has displayed rather regular variations over the past 1000 days with maxima occurring approximately every 425 days. The mean range during this interval has been about 6.8 - 9.0 visually and in late May, RS Cygni passed through a maximum near a mean magnitude of 7.2v. This variable is an excellent star for observers using binoculars and small telescopes and is located in a rich star field a couple of degrees from the galactic plane.

Observers or would-be observers having comments or questions about observing these or any other variable stars are encouraged to contact me at ocn@total.net.

Clear skies and great observing to all of you !,

4. A GUIDE TO VARIABLE STAR OBSERVING - Steve Robinson

"One Observer's Approach"

The approach given here steps the beginning visual observer through a process of setting up an observing program using readily available resources, and it attempts to do this in a systematic manner easily doable with no more than Bulletin 65, the The AAVSO Manual for Visual Observing of Variable Stars, and star charts available from the AAVSO website at <http://charts.aavso.org/>. A couple of additional files again from AAVSO website, united.txt for chart information (<http://www.aavso.org/charts/united.txt>), and AAVSO Star Positions with epoch 2000 coordinates (<http://www.aavso.org/aavsostarpositions.txt>), were used to construct the table found at the end of this discussion.

My target audience is the urban or suburban amateur with a scope of 8 inches or larger who is beginning his or her attempts with variable stars. Since in the procedures below, I use the AAVSO month/RA range map found in the Manual, I am targeting observers who observe between the end of twilight and midnight or slightly beyond. I consider this sensible, especially if that same observer must trudge to work and pretend to be productive that next morning.

One final consideration is that this guide is written for the person who has less than excellent skies. In my own case, the weather in Washington DC is frequently cloudy, hazy, and light polluted. The guide is designed to help folks like me target stars that they will be able to observe.

The guide is organized into the steps found below.

1) Find RA and Dec range for the date

The Manual for Observing Variable Stars is useful here. It is found at <http://www.aavso.org/cdata/manual/chapter5.stm>. Table 5.1 (page 35) provides a range of RA values given the month for which observations are planned. For example, the RA hours of 16-23 are suggested for observing between the hours of 9 pm and midnight during the month of August. The determination of good values for declination requires knowledge of latitude. For example, I live at latitude 39 degrees north. This is the approximate altitude of the North Celestial Pole above the northern horizon. The celestial equator is 90 degrees south of the pole. Its altitude above the horizon in the south is computed as 90 minus site latitude, or 51 degrees above the southern horizon. This value corresponds to an absolute southern declination limit of -51 degrees. Southern observers can use a similar approach for determining their northernmost declination. Realistically, this absolute declination is rarely reached. Few observers have absolutely flat horizons, and if they did and live at sensible altitudes, atmospheric distortion would make that horizon difficult to use. A reasonable limiting horizon may be something like 20 degrees or so. In my case, subtracting those 20 degrees leaves me with a lower limit of -31 degrees DEC. Again, similar reasoning would be appropriate for the southern observer.

2) Find suitable RA range in AAVSO Bulletin 65

AAVSO Bulletin 65 is ordered by Right Ascension so this task is trivial. One approach is to download the bulletin in text mode from <http://www.aavso.org/bulletin/> for the entire sky, and chop out the parts not in the current RA range, and then print out the rest. Be sure to save the rows describing the months (very first few rows at the very top). Now cross off any star whose designation Dec value lies outside the declination limit for your site. The Dec value is the two-digit number and the plus or minus sign at the end of the designation found in column 1 of the bulletin. The first four digits stand for the hour and minute of Right Ascension for 1900.

3) Find Stars in the month column

Scan across the top of the Bulletin. You will see the months of the year. Since we are approaching in the month of August, scan down that column. We are looking for plusses. The plus tells you that according to AAVSO Bulletin 27, the star corresponding to this row is brighter than 11th magnitude. If the star at that position is also above your site Dec limit, place a circle around that star. For my site, continuing downward, I find 1611+38, 1841+34 and a number of others. See the partial table at the end of this discussion. If observing from an urban or suburban location, you may very well be limited to 11th magnitude and brighter stars. If this is the case, your program may change each month as new stars brighten into range and current stars dim from it. Because of this, you may want to further refine your list. Take for example, 1901+08. Note that at minimum, the star dims to magnitude 11.5 as found in <6.1-11.5> This says that the star is in our magnitude range most of the time, and may make a good star for consideration in a bright variable program. Also note that the +++++ extends across the month. This indicates that the star is probably good into the month of September as well. You will have to check the full bulletin to guarantee this, but in all likelihood, it is. Notice 1908-18. The star falls below 11th magnitude shortly into the month. This star is probably less good since it drops out of range quickly, and probably won't

be visible next month either. If there are two or three plusses behind spaces, you might decide this is a good star to follow since it is just rising into range, but you will want to check the following month to make sure the star would be available long enough to make it worth spending the time to find.

4) Cross off stars not having D or DR (Reversed) charts

Now it is time to visit the AAVSO web-site at <http://charts.aavso.org/> , or [united.txt](#) and look up some charts. In this step, we want to remove from further consideration, stars not having D or DR charts. This chart size is good for scopes of the 1500-2000 mm range. The central section of these charts accommodate a field of view of one degree with enough surrounding area to help center the field should that be needed. Owners of SCT telescopes should use the DR charts while owners of Newtonian scopes should use D charts. A summary of the information found on [united.txt](#) is shown in the table, so at least for the month of July, AAVSO observers have an easy time of it.

5) Cross off stars not having suitable comp stars in the field

To do this, the star charts must be examined individually. This is a relatively easy task from our perspective since we are interested only in stars in the vicinity of 11th magnitude and brighter. To be effective here we want charts having stars in the 10th through 12th magnitude range. If the chart doesn't have stars that bracket our expected magnitude, move on to the next chart, and scratch the chart off the list.

6) Cross off stars in congested fields

For stars that pass the comp star test, check the field for congestion. If the field is crowded, the observer may wish to save that star until having more experience. The telescope simulator found at <http://www.aavso.org/powerpoint/estimate.html> gives an idea of the process for identifying the variable star in a non-congested star field. I would recommend starting with the easy fields first, and graduate into the congested field stars after a few successes have been had.

7) Observe the stars that remain

When the steps outlined above have been completed, you will have constructed an initial observing program for the month. There may be a list of 15 or more stars. At the beginning, prune this list down to 5 or 6, and go from there. You will find the remaining list a reasonable challenge. There are a couple of ways to locate stars. The first is to star-hop, and the second is to use digital setting circles that allow field location using RA and DEC locations. The AAVSO star charts themselves provide J2000 RA and DEC coordinates. In my own light polluted area, I have found it easier to use the digital setting circles since the dimmer stars are difficult to see with the unaided eye. In my area during the summer, only the brightest stars are visible to the naked eye. Digital Setting circles make all the difference. The process of locating the field becomes mostly one of Point-and-Shoot! There are a couple of things that I have found useful for finding fields. The first is a wide-angle eyepiece. My favorite is the 35mm Panoptic which when paired with my 2000mm focal length mirror produces about 57x. With this eyepiece, I can get a 66 arc-minute field of view, and I can see the center section of the D scale chart. It is also helpful to have the use of a drive to hold the field of view in the telescope stationary when determining the part of the field I am seeing. First locate north. My telescope has a rotating nose that helps position the eyepiece for good viewing. The C8 has a rotating star diagonal. Both of these devices serve the convenience of the observer, but complicate the

determination of the direction North. The easiest way to find north is to nudge the telescope toward Polaris. Notice the place in the field of view where new stars enter the field. This is north. Point the bottom of the AAVSO star chart in that direction, and use the resulting orientation to identify the field. Once identified, center the field on the location where you expect the variable to be seen. Now use a higher magnification eyepiece to increase the magnification. A reasonable choice might be a 20mm giving 100X. Increasing magnification does two things. The first is to separate the stars, but the second more important impact is to darken the sky. Dimmer stars now appear. A star, which is invisible at 50x, is often clearly visible at 100x. Again center the field on the expected location of the variable. Depending on the brightness of the star and the sky, it may be possible to estimate the brightness of the variable at this magnification. It might be necessary to use even higher magnification with a 13mm or perhaps the 10mm eyepiece to darken the field enough to make an estimate with a suitable comp star, which may be in the 12th magnitude range. Remember, the variable star should be bracketed by the comp stars in terms of brightness, and the lower bracket on a variable at 11th magnitude may very well be somewhere around 12th magnitude. The comp star may need additional magnification to become visible.

8) Report Observations to AAVSO

The AAVSO staff has done a nice job with the web-based WEBOBS data entry software. You will have to apply for an observer identifier (observer initial), and with that, you can submit your observations. This feature can be found at <http://www.aavso.org/cdata/webobs/>. You will probably want to know if you were correct in your assessment of the magnitude of the variable. You may even want to use this information to determine if you even had the correct star. Check <http://www.aavso.org/ql/> for the quick looks file to see what other observers are reporting. There is even a light curve generator at <http://www.aavso.org/adata/curvegenerator.shtml> to help put the observation into perspective.

Parting thoughts

In the table below, I have included part of my work with AAVSO Bulletin 65 for the month of August. As you can see, the table includes the star designation, star name, the segment of the Bulletin that corresponds to the selected star for the month of August 2002, and the star's magnitude range, period, coordinates and at the end of the line, the available charts are shown. The charts are shown in the format XXXrYYY, where XXX are non-reversed, and YYY are the reversed charts. If the lower case 'r' is not present, no reversed charts are available.

The central RA range was chosen to permit usage of the data into the month of September as well.

Good Observing
Steve Robinson
srobinso@mindspring.com

Partial Listing of bright variables RA:16-23
and north of -90 for month number 8

Desig	Name	Map	Mag Range	Period	RA(j2000)	DEC(j2000)	Charts
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1841+34	RY Lyr	8M++++	<9.8-14.7>	325.7	18:44:52.4	+34:40:35	EDBFrBDEF
1901+08	R Aql	+++++	<6.1-11.5>	284.2	19:06:22.2	+08:13:51	BDrBD
1908-18	RX Sgr	+	<9.7-13.8>	335.2	19:14:33.4	-18:48:46	BD
1909+41	RU Lyr	++++3	<10.6-15.1>	371.8	19:12:20.9	+41:18:14	DE
1910-19	R Sgr	M+++++	<7.3-12.5>	269.8	19:16:41.7	-19:18:26	ABCD
1913-19	S Sgr	+	<10.2-14.8>	230.6	19:19:26.5	-19:01:26	D
1913-21	Z Sgr	8M++++	<8.6-16.0>	450.4	19:19:42.9	-20:55:36	BD
1916+37	U Lyr	+++++	<9.5-12.0>	451.7	19:20:03.9	+37:52:27	BDrBD
1929+28	TY Cyg	++24M+	<9.5-14.6>	349.0	19:33:51.7	+28:19:41	DEFrDE
1933+11	RT Aql	+++++	<8.4-14.0>	327.1	19:38:01.1	+11:43:15	BDE
1935+09	RV Aql	+++++	<9.0-14.2>	218.6	19:40:43.2	+09:55:56	FBDErBDEF
1940+48	RT Cyg	m ++	<7.3-11.8>	190.2	19:43:37.8	+48:46:41	CDrDC
1943+48	TU Cyg	++	<9.4-14.2>	219.4	19:46:10.8	+49:04:25	DE
1946+04	X Aql	+20M++	<8.9-14.9>	347.0	19:51:29.2	+04:27:56	BDEFrBDEF
1946-59	S Pav	+++++	<7.2- 9.3>	380.8	19:55:13.7	-59:11:43	B
1949-29	RR Sgr	M+++++	<6.8-13.2>	336.3	19:55:56.6	-29:11:24	BD
1951-42	RU Sgr	+++++	<7.2-12.8>	240.4	19:58:42.9	-41:50:58	BD
1952-02	RR Aql	+++++	<9.0-13.9>	394.7	19:57:36.7	-01:53:05	BD
1958+49	Z Cyg	+++++	<8.7-13.3>	263.6	20:01:27.0	+50:02:36	BDErDEB
2005-14	R Cap	12M++	<10.6-13.6>	345.1	20:11:18.3	-14:16:04	BDE
2007+15A	S Aql	+++++	<8.9-12.4>	146.4	20:11:37.5	+15:37:13	BDrBD
2007-47	R Tel	9M++++	<8.6-14.8>	461.8	20:14:44.7	-46:57:33	DB
2009+38	RS Cyg	+++++	<7.2- 9.0>	417.3	20:13:23.5	+38:43:44	B
2011-39	RT Sgr	+++29M	<7.0-13.3>	306.4	20:17:43.9	-39:06:45	BD
2016+47	U Cyg	+++++	<7.2-10.7>	463.2	20:19:36.3	+47:53:41	ABCDrBCD
2026-22	RU Cap	+++++	<9.7-15.1>	347.3	20:32:33.8	-21:41:22	DErDE
2029+54	ST Cyg	9M++++	<9.9-13.9>	337.2	20:32:33.9	+54:56:59	BDE
2034-29	R Mic	++22M+	<9.2-13.4>	138.6	20:40:03.1	-28:47:27	BD
2038+47	V Cyg	+++++	<9.1-12.8>	421.2	20:41:18.2	+48:08:31	BDrBD

5. CVs and UNUSUAL OBJECTS FOR JULY 2002 - Mike Simonsen

What's In A Name

The conventional system for naming variable stars is archaic, but has served us for over 150 years now.

In order not to get variables confused with stars assigned Bayer lower case letters a-q, Friedrich Argelander began naming variables with the letters R-Z. After those were used up RR-RZ, SS -SZ, etc. were assigned. Then they start over with AA-AZ, BB-BZ, etc. all the way to QZ (skipping the J's). This allows for 334 names. After the letters are used up the stars are simply named V335, V336, V337 and on and on.

As if that weren't confusing enough, there are now a host of other prefixes and numbers assigned to variable stars and objects. The following is a guide to help the reader understand what these names mean and where they came from.

NSV xxxxx - These are stars in the New Catalog of Suspected Variable Stars (NSV), produced as a companion to the General Catalog of Variable Stars (GCVS) edited by Kholopov, P. N., et al. All stars in the NSV have reported but unconfirmed variability, in particular, lacking complete lightcurves. Some NSV stars will eventually prove truly variable; others will be spurious. Information about this and the General Catalog of Variable Stars can be found at:

<http://www.sai.msu.su/groups/cluster/gcvs/gcvs/intro.htm>

Many stars and variable objects are assigned prefixes based on astronomer, survey or project names. Many are temporary designations until they are assigned a conventional name in the GCVS.

Markarian xxxx - These are active galaxies from lists published by the Russian astrophysicist B.E. Markarian. Markarian looked for galaxies that emit unusually strong UV radiation, which comes from either pervasive star-formation HII regions or from active nuclei. In 1966, Markarian published 'Galaxies with UV Continua'. Around that time, he started the First Byurakan Spectral Sky Survey (FBS), which is now completed. In 1975, Markarian initiated a Second Byurakan Survey (SBS). His collaborators continued the SBS after his death. For more information see 'Active Galactic Nuclei', by Don Osterbrock, http://nedwww.ipac.caltech.edu/level5/Osterbrock3/Oster_contents.html

HadVxxxx - This represents variables discovered by the Japanese observer Katsumi Haseda. Haseda's most recent discovery was Nova 2002 in Ophiuchus, V2540 Oph.

LD xxx - Variables discovered by Lennart Dahlmarm, a Swedish retiree living in southern France are given this prefix. Dahlmarm has been conducting a photographic search for new variable stars; discovering several hundred to date.

TKx - TK stands for T.V. Kryachko. The TK numbers of new variables continue a numbering system first introduced in Kryachko and Solovyov (1996). This acronym was invented by the authors.

TmzVxxx- These are variables discovered by Japanese comet-hunter/variable star observer Kesao Takamizawa.

3C xxx - These are objects from the Third Cambridge (3C) catalog (Edge et al. 1959), based on radio-wavelength observations at 158 MHz. There are 471 3C sources, numbered sequentially by right ascension. All 3C sources are north of -22° declination. The 3C objects of interest to variable star observers are all active galaxies (quasars, BL Lacs, etc.).

Another group of objects is labeled with the prefix O, then a letter, then a number (OJ 287 for example). These objects were detected by the Ohio State University radio telescope "Big Ear" in a series of surveys known as the Ohio Surveys. <http://www.bigear.org/ohiosurv.htm>

MisVxxxxx - The stars are named MisV after MISAQ Project Variable stars. The MISAQ Project makes use of images taken from all over the world, searching for and tracking astronomically remarkable objects. The number of variables discovered so far reached 1171 on May 15, 2002. Few of these stars have lightcurves, and the type and range of many are still undetermined. The project website url is: <http://www.aerith.net/misao/>

Many variables are named with prefixes associated with surveys or satellites, combined with the coordinates of the object.

FBS hhmm+dd.d - Stands for First Byurakan Survey and the coordinates of the object. The First Byurakan Survey (FBS), also known as the Markarian survey, covers about 17,000 square degrees.

SBS hhmm+dd.d - Indicates objects discovered by the Second Byurakan Sky

Survey, plus the coordinates of the object.

ROTSE1 Jhhmmss.ss+ddmmss.s - The Robotic Optical Transient Search Experiment (ROTSE) is dedicated to the observation and detection of optical transients on time scales of seconds to days. The emphasis is on gamma-ray bursts (GRBs), the most powerful explosions in our Universe. Objects detected by this survey are designated with positions to 0".1 precision. <http://www.umich.edu/~rotse/>

XTE Jhhmm+dd - These are objects detected by the Rossi X-Ray Timing Explorer Mission. The primary objective of the mission is the study of stellar and galactic systems containing compact objects. These systems include white dwarfs, neutron stars, and possibly black holes. <http://xte.mit.edu/>

ROSAT is an acronym for the ROentgen SATellite. ROSAT was an X-ray observatory developed through a cooperative program between Germany, the United States, and the United Kingdom. The satellite was designed and operated by Germany, and was launched by the United States on June 1, 1990. It was turned off on February 12, 1999.

Prefixes for x-ray sources detected by ROSAT include, 1RXS, RXS and RX. The J2000 coordinates for the source are then stated according to the accuracy of the X-ray position and the density of stars in the field. arcsecond accuracy ---> RX J012345.6-765432 tenth-arcmin accuracy ---> RX J012345-7654.6 arcmin accuracy ---> RX J0123.7-7654

Distressingly, these can all refer to a single object!

TAV hhmm+dd - The Astronomer Magazine, in England, has a program that monitors variable stars and suspected variable stars. TAV stands for The Astronomer Variable followed by the 1950 coordinates. TASV hhmm+dd - TASV stands for The Astronomer Suspected Variable followed by the 1950 coordinates. If a J precedes the coordinates (TAS(V) Jhhmm+dd) they are equinox 2000. The Astronomer Variable star page can be found at this url: <http://www.theastronomer.org/variables.html>

PKS hhmm+ddd - This was an extensive radio survey (Ekers 1969) of the southern sky undertaken at Parkes (PKS), Australia, originally at 408 MHz and later at 1410 MHz and 2650 MHz. These sources are designated by their truncated 1950 position. For example 3C 273 = PKS 1226+023. This is still the most common, and useful, system of naming quasars.

SDSSp Jhhmmss.ss+ddmmss.s - In October 2001, the first results of a new survey done using the Sloan Digital Sky Survey were published. In this paper, 19 new and 3 previously known CV systems were identified. The positions of the CVs are given in the names. SDSS-(Sloan Digital Sky Survey), p- (preliminary astrometry), Jhhmmss.ss+ddmmss.s (the equinox J2000 coordinates).

The complete survey is expected to locate at least 400 new CVs. The abstract and full paper can be read starting at <http://xxx.lanl.gov/abs/astro-ph/0110291>

With more and more surveys being conducted, and more new variables being discovered, this list of non-conventional names will undoubtedly grow. I hope this explanation has helped to demystify the existing names and prepares you for the onslaught of names yet to come.

There is a CDS Web page where you can find details about specific acronyms. <http://vizier.u-strasbg.fr/cgi-bin/Dic>

My sincere thanks to Brian Skiff for his guidance and help in preparing this article.

6. PLAN ON AAVSO CHART ACTIVITIES by Janet A. Mattei

(Posted on the AAVSO Discussion List on July 20, 2002)

At the 91st Spring Meeting in Hawaii we hosted a "Town Meeting" style discussion of variable star charts. We have begun taking action on many of the suggestions offered during the meeting. Below is a summary of where we are in terms of various chart related items along with announcements of some new initiatives.

Chart Announcement Mailing List

It was suggested during the Town Meeting at the 91st Spring Meeting that we establish a mailing list to announce chart updates. In the past we had been posting updates to the web site and in Eyepiece Views. However, as chart activity increases it will help to have a dedicated channel for issuing chart updates and news. So we have created an electronic mailing list where we will post the publication of new charts and general news involving the AAVSO chart program. To sign up send an e-mail to charts@aaavso.org or you can sign up automatically by sending an e-mail to majordomo@aaavso.org with this line in the body of the e-mail:

subscribe charts-announce

New Charts

After preparing and publishing over 1500 new/revised/reversed charts since the start of 2002 we are going to be shifting our focus on revising existing charts (more below). With that said, new charts will be issued when circumstances warrant such as discovery of novae, bright supernovae, and/or requests for observations from the scientific community, etc.

Revising Charts

Revising existing charts and comparison star magnitudes is a difficult and detail-oriented process. It takes a long time to get it right because you need to do research in numerous photometric catalogs and/or websites, look at existing and historical charts and comparison star magnitudes published by the AAVSO and other organizations, either prepare a completely new chart(s) using the new format or make the changes on the existing chart(s), and check everything multiple times. However, the AAVSO recognizes the vital importance of updating charts and comparison star magnitudes.

We will commit to publishing updated charts every month - up to ten stars per month, beginning Oct 1. Soon we will create a list of the first 50 stars to be updated and we will post them to the charts web site when the list is ready. The goal is to increase the monthly updates, as much as we can, after we have a sustained program underway

and can find areas where we can speed things up.

Variable Star Chart CDROM 2.0

This update to the Variable Star Chart CDROM 1.0 will be published before the Annual Meeting in October. We will send it to the printer on September 1. It will likely be a 2-cd set and will come with Windows software that acts like our Online Chart Search Engine and allows you to print charts on only 1 sheet of paper using almost any printer. It will include thousands of new/revised/reversed charts; constellation charts; photoelectric photometry (PEP), eclipsing binary, and RR Lyrae charts; in addition to the charts on the earlier CD. The software will only run on Windows but the charts can be accessed on any operating system. The directory structure will be a mirror of the Charts FTP Site.

AAVSO Chart Activity Coordination

These projects and goals will be worked on by several members of the AAVSO Chart Committee with Aaron Price coordinating and working on them from AAVSO Headquarters, under my direction. We are very excited about these projects and look forward to providing observers with the highest quality variable star charts possible.

If you have any suggestions or comments please send them to:

charts@aavso.org

Thank you!

Good observing!
Janet A. Mattei

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Good observing!

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