



Northwest Skies

The Official Newsletter of the Tacoma Astronomical Society
Tacoma, Washington State, USA

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75 Years of Amateur Astronomy in the Pacific Northwest

January—February 2006

The President's Message

by Dave Armstrong

I hope everyone had a very Merry Christmas and will have a happy and healthy New Year. Having received the short straw at the last Board meeting, I will be your new TAS President for 2006. This is a position I have not held since 1965, when incidentally, I skipped out in mid August and moved to Hawaii to work on the Mauna Kea Site Survey for the University of Hawaii. I don't anticipate a repeat of that event this year.

The slate of Officers includes Bill Briggs (Vice President), Ken Board (Secretary) and John Pettit (Treasurer). Mentioning the Treasurer reminds me

that we all became former members on January 1st, unless you have already paid your 2006 dues, and now need to re-up for 2006. Please pay your dues early while John still has the overlapping help of Sion as the retiring Treasurer.

Our Astronomers of the Year, Joe Witherspoon for the 'older youth' and Dan Gifford of the younger youth deserve our applause. This is the fourth time Dan has made the top Astronomer list. If you haven't helped Joe with one of the outreach programs he lines up, get up out of your recliner, load the scope in the car

and come on out — it is fun.

Our next general meeting will be January 3rd and will usher in a big change. Due to the construction and refurbishing of the Thompson Hall Science Building, we will have to move to a new location on the UPS campus until further notice. The January meeting will be in room 109 of Wyatt Hall. We will try and post some directional signs on the meeting night. See you there

Keep Looking Up

Dave Armstrong

Observations

by Ray Stinson

Place: Albion Basin, Alta Ski Area, Utah.
Time: Mid-evening in June 1999.

After a full days work chasing problem with the medical imaging systems in and around Salt Lake City, I went up to my favorite observing location with the trusty C11 in tow. The night was clear

and warm and the skies steady. I set up the heavy tripod and mounted the optical tube in place. After some minor adjustments the alignment was complete and the scope tracking pretty well. I put in my favorite cassette tape of music and turned up the volume as no one was around and I had the place to myself. The

observing place I had chosen was at 9500 ft in elevation at the end of Little Cottonwood Canyon accessed by a dirt road above Alta Ski area. The flat parking lot was surrounded by 10,000 ft mountain peaks for nearly 300 degrees. To state the obvious, the seeing conditions

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Northwest Skies is a bi-monthly publication of the Tacoma Astronomical Society. All opinions expressed in this newsletter are those of the contributors and not necessarily those of the Tacoma Astronomical Society.

Original article contributions are strongly encouraged and may be submitted as an email attachment to

editor@tas-online.org

Bert Brown describes the tremendous forces and energies released during Gamma Ray Bursts and the current efforts to observe and analyze these events.

People to Contact

You can also contact us via email through our website at

www.tas-online.org

Our mailing address is:

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What's Up In Astronomy

by Bert Brown

There have been at least a half-dozen times in the past eight years of this column that we have mentioned 'Gamma-Ray Bursters' (GRBs), those sudden but brief bursts of gamma-rays detected by satellites. As new observation techniques evolve, new things are being learned and new theories are forthcoming, so maybe it is time for an update.

You may recall that gamma rays are high-energy, uncharged light 'particles'. On Earth, and also in ordinary stars, they are one of the products of radioactivity, with energies higher than that of X-rays.

GRBs were first discovered in 1967 by a military satellite looking for Russian nuclear activity.

(Fortunately, the discovery did not trigger a war). They consist of a brief burst of gamma rays, lasting from a fraction of a second to several minutes. A problem in studying them has been to pinpoint them in the sky, so as to correlate GRB observations with those of optical telescopes. Schemes have been devised to point telescopes toward the source of the gamma rays, within minutes of their occurrence. When this was done, it was found that the GRBs had an 'afterglow' of visible light and radio emissions. With the visible light, spectrum evidence yielded red shifts that established the GRBs as extra-galactic. Knowing approximate distance, one can calculate that the energy output of these things is enormous; in the

order of 10^{44} joules, probably in a pair of oppositely directed narrow beams. So we would not see them unless we happened to be in line with one of the beams.

Observations and theories have apparently separated GRBs into two main classes which have different production mechanisms: those with a burst duration greater than two seconds, and those with a shorter duration.

We will discuss the long duration class first. Obviously such an energy output must be associated with a cataclysmic event, and immediately supernovae come to mind. But GRBs are pretty rare, so ordinary supernovae probably won't make the cut. The leading candidate



Artists impression of a Gamma Ray Burst

Credit: NASA

for a GRB-associated supernova is a 'collapser', a core-collapse event in which the original star is massive, at least 8 and possibly as much as 30 solar masses. Also, it must have lost its hydrogen and helium envelopes before the collapse. This focuses the attention on a sub-class of supernovae, called 'Ic'. Of hundreds of GRBs in recent years, observers have been able to associate about a dozen with supernovae, and at least three of these seem to have been the very energetic Ic type. Clearly the evidence is not conclusive, but GRBs are briefly the brightest things in the universe and can be seen at greater distances than supernovae; also, observ-

ing them is difficult in their afterglow.

The theoretical scenario is that the collapser has a rapid spin which flattens its ejected material into a torus (donut) shape; the two narrow gamma-ray beams consist of material ejected perpendicular to the plane of the donut. It is hoped that a new NASA satellite, Swift, will be able to locate GRBs faster and more precisely so as to establish a better connection between them and supernovae.

Now for the short duration GRBs; those lasting a couple of seconds or less. First, their very shortness makes it more difficult to locate their position in the sky with optical in-

struments, so distance determinations are scanty.

But new techniques are getting some results. Now three short-duration GRBs have been detected and localized—occurring on May 9, July 9, and July 24 of this year. The first of these was recorded by the Swift satellite mentioned above, the other two by older systems. None of the three were associated with supernovae, and they all were in old galaxies—an old spiral, and a couple of old ellipticals, over 3 billion light years away. Their energy outputs reaching earth were much less than the longer duration GRBs, 'only' about 10^{41} or 10^{42} joules;

however, if the gammas were ejected in all directions rather than in narrow beams, their total energy could also be near the 10^{44} joules of the longer duration events. Theorists say that the most likely mechanism for such events is the merger of a matched or mixed pair of compact stellar objects--neutron stars or black holes--that have been orbiting each other for hundreds of millions of years. Other plausible scenarios simply don't produce the required energy.

As I have said many times before, 'Stay tuned', and Happy New Year!

Sources:

'Supernova Spectral Feature Addresses the Connection with Gamma-Ray Bursts' by Bertram Schwarzschild, *Physics Today August 2005*, p21-22

'First Identification of Host Galaxies for Short Gamma-Ray Bursts', by Bertram Schwarzschild, *Physics Today November 2005*, p17-19.



Snacks for the General Meeting

Uh oh! We are running out of volunteers to bring snacks.

January

**We need a
volunteer!**

February

**We need a
volunteer!**

We will be providing coffee and tea during the break as usual though. Thank you!



Astrophotography: Part 1, Simple Beginning

by Jarvis Krumbein

The night sky can yield stunning photographs with very simple equipment at low cost. To start, all that is required is a camera that can make long exposures, a tripod and color film, either print or slide.

The camera should have a shutter that can be opened and left open by using the **B** setting for the shutter. A cable release with a lock is required to open and close the shutter. While older cameras that do not require batteries for operation are preferred, they are not necessary.

The camera should also permit manual control of the lens opening. The ability to change lenses while desirable is not required. Cameras that feature automatic exposure and auto focus are not generally useful for astrophotography.

The typical 35mm camera has a normal lens of 45 to 50mm focal length. The lens, when wide open may be any where from f1.8 to f3.5.

A wide angle lens will have a focal length shorter than the normal lens and can be any where from 24mm to

35mm and will probably be either f2.8 or f3.5.

Modern color film, either print or slide, will be used for all the techniques described. A film speed of ASA 400 or higher is preferred but slower films will also work well. Kodak and Fuji films are readily available and recommended. When having print films processed a good idea is to also have a CD made. As will be described in a later article, the CD allows the user to modify the finished picture if desired.

It is also helpful to make notes of the camera settings and film used when taking pictures. These notes will help when examining the first roll of film so that the best camera settings can be determined.

Star Trails

The simplest method of shooting the stars requires a clear dark sky and the camera with cable release mounted on a tripod. Set the focus of the camera at infinity.

Set the shutter to the **B** setting so the shutter will stay open as long as cable release is pressed

and locked, and set the lens aperture to wide open.

Aim the camera at Polaris (the North star). Open the shutter for 30 seconds. This will capture every star you can see with the naked eye and trailing will not be noticeable. Repeat for the next exposure but keep the shutter open for about 15 minutes. More stars will be visible and the stars will have noticeable trails. Make a third exposure with the lens stopped down two stops and the shutter kept open for one hour. There will be the same number of stars as in the 15 minute exposure but the star trails will be four times as long. Repeat the above series of exposures but first re-aim the camera so that it is pointed at the celestial equator.

During the winter, the constellation Orion will be well placed in the sky and should be in the area covered by the picture. For other times of the year, try to include easily recognized constellations in the picture. This finishes our first night of picture taking. Take the rest of the pictures on the film on any subject desired and have the film



Star Trails with Tree

Credit: Jerry Cotey

processed. When the finished pictures are examined you should have the following.

- (1) Star images without trails visible against a very dark sky. Some of the stars will show color.
- (2) Star trails of more stars than were visible in (1). Note also that the sky background is much brighter. Notice also that there is more color in many of the stars that are visible and that those farther away from Polaris have longer

trails.

- (3) The star trails are now longer than in (2) and measure about 15 degrees, the earth's rotation in one hour. Note that the trails are curved more sharply for the stars near Polaris and that its trail is also curved. This is because Polaris is not exactly at the celestial pole. The sky background should also be about the same brightness as in (2) because while the exposure was four times longer, the light was reduced to one

quarter by closing the lens down two stops.

- (4) Should be similar to (1) but for the stars near the celestial equator.
- (5) Should be similar to (2) but the trails will be longer and will be less curved, the trails at the equator will actually be straight while the farther north trails will show more curvature.
- (6) The trails will be much longer than in (3) but are still 15 degrees long. If Orion is in the picture, note the color of the great nebula and compare it to the colors of the other stars.

Points to remember:

- The longer the exposure, the longer the trails.
- The sky background will be brighter for longer exposures unless the lens is stopped down to compensate. Stopping down the lens may also make the star images sharper.

When taking star trails, silhouetting a tree against the stars can make an interesting picture as can including foreground items which will appear in the photo.

In a brand new series, Jarvis Krumbein will provide a detailed and practical course on astrophotography.

Magazine Subscriptions

Don't forget to use your member benefit by receiving a discounted annual subscription to either Sky & Telescope or Astronomy magazines.

Sky & Telescope
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Contact the Treasurer, John Pettit, for more information.

January Schedule of Events

- January 3rd:**
General Meeting. Please note we are meeting at **Wyatt Hall, Room 109** at UPS until further notice.
7:30 PM.
- January 6th:**
Outreach Stomp Rockets and Star Party at Bethel School District Transitional, Spanaway / Parkland. 12:00 PM.
- January 7th:**
Public Night at Pierce College, Sunrise Building. Program will be presented by the TAS Students.
7:30 PM.
- January 10th:**
Outreach Solar Party at Mary Queen Of Peace School at Sammamish.
1:30 PM
- January 21st:**
Public Night at Pierce College, Sunrise Building. Program will be 'Telescopes 101' presented by Dan Gifford.
7:30 PM.
- January 24th:**
Outreach Star Party at Fruitland Elementary School.
6:00 PM.
- January 27th:**
Outreach Solar Party at Nelson Crain Christian School, Puyallup. 9:00 AM.

November General Meeting Minutes

During the Show and Tell session, Art Dixon demonstrated an Alt/Az pointer for locating objects in the night sky using his Palm Pilot. Chuck Jacobson reported on his recent trip to Arizona to attend the annual Hands on the Sun presented by Coronado. Chuck also showed several photos he had taken of Mars recently. The photos showed a large dust storm. John Petitte showed a paper model of the Keck Telescope in Hawaii he had con-

structed. The kit was purchased from scikits.com.

Bob Isaacs introduced Boeing Employees Astronomical Society President, Dave Ingram. Dave spoke to the membership regarding the BEAS Christmas Party.

Joe Witherspoon shared two thank you letters he received from Sahalie Middle School and Purdy Elementary School for Outreach Events at the two schools.

By Ken Board

Matt Flood introduced this month's speaker, Cheryl Niemela. Cheryl is a teacher at Rogers High School. She is also a NASA HEASARC Ambassador. She gave an excellent presentation on Gamma Ray Bursts. Thank you Cheryl for your presentation.

January 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3 General Meeting.	4	5	6 ☽ Outreach Event.	7 Public Night.
8	9	10 Outreach Event.	11	12	13	14 ○
15	16	17 Trustees Meeting.	18	19	20	21 Public Night.
22 ☾	23	24 Outreach Event.	25	26	27 Outreach Event. Student Meeting.	28
29 ●	30	31				

The 2006 Board Officers and Christmas Party



Left to Right: John Petitt (Treasurer), Bill Briggs (Vice-President), Dave Armstrong (President) and Ken Board (Secretary).

The Tacoma Astronomical Society 2006 Christmas Party was held at Trinity Lutheran Church hall on the 16th December. Many members and their families attended.

The Board of Trustees took the advisory ballot and voted upon the new officer positions. Joe Witherspoon received Astronomer of the Year award and Dan Gifford received the Student Astronomer award.

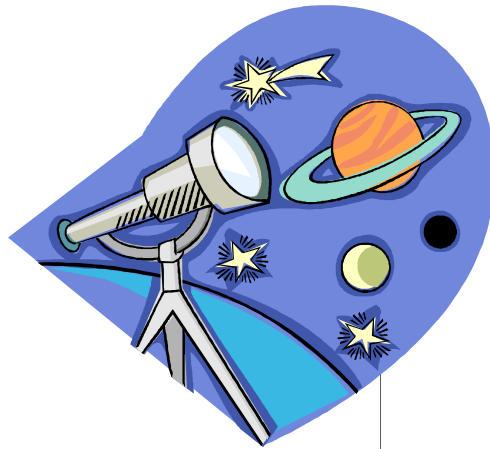
February Schedule of Events

- **February 4th:** Public Night at Pierce College, Sunrise Building. Program will be 'Winter Sky Splendors'. Presented by Sion Heaney. 7:30 PM.
- **February 7th:** General Meeting. Please note we are meeting at **Wyatt Hall, Room 109** at UPS until further notice. Program to be announced. 7:30 PM.
- **February 25th:** Public Night at Pierce College, Sunrise Building. Program will be '110 Celestial Objects' Presented by Matt Flood. 7:30 PM.

February 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4 Public Night.
5 ☽	6	7 General Meeting.	8	9	10	11
12	13 ○	14	15	16	17	18
19	20	21 ☾ Trustees Meeting.	22	23	24 Student Meeting.	25 Public Night.
26	27	28 ●				

Northwest Skies



First Class

If undelivered, please return to

Tacoma Astronomical Society
PO BOX 8881
Tacoma, WA 98418

We need your articles.

If you are interested in contributing an article or would like to make a suggestion as to what you'd like to read in **Northwest Skies** then please do contact the Editor. We are always in need of original contributions.

Deadline for submitting articles for inclusion in the next edition of **Northwest Skies** is the last Thursday of the month before publishing.

We're on the web!
WWW.TAS-ONLINE.ORG

Continued from front page
were pretty close to great. As I was going through my list of previously chosen objects such as the double cluster (ngc869), the owl cluster (ngc457), Jupiter and Saturn a couple of people appeared seemingly out of nowhere. Of course I invited them to look through the scope and the requisite ooo's and ah's were sounded by the observers. I explained what the objects were and how to observe them thus gaining deeper understanding of what they were looking at. Several more people appeared and pretty soon there were no less than 20 people waiting in line to look thru the scope. Let me explain here that this was a wilderness site more than 25 miles from the nearest city and to

my knowledge no one was around when I set up the scope.

To make a long story short, all these people were students from nearby BYU who were on a camping trip to a campsite nearly three miles away at the base of one of the peaks around Albion Basin. It is so quiet that they heard the music from my car radio and came over to investigate. The music (not to everyone's taste) was a tape of "The Vocal Majority" which is a 130 man Barbershop Chorus singing sacred music mostly arranged by Jim Clancy. The Saltaires in Salt Lake City sing the same music for concerts at Temple Square. (I sing bass in that Chorus). When these students saw the telescope,

their interest peaked remarkably and our impromptu Star Party was in full swing.

What makes this story remarkable is that on successive weeks during the summer, these same students showed up at Albion Basin with more of their friends to look at the sky. They even brought food and drinks for everyone. I had to ask a couple of my friends to come up with their scopes so we could accommodate everyone. I guess the moral of the story is that every time you set up your scope, a crowd gathers and it is fun to share the wonderful views of the skies. As you read this, I'm sure you've had similar experiences observing in some rather interesting places.