Welcome To The

The 21st Weekend Under the Stars

July 28, 29, 30, 2011

Foxpark, Wyoming

Latitude 41.0839N and Longitude 106.1594W, Elevation 9174

Sponsored by:

The Cheyenne Astronomical Society (CAS)
Email: casmail@bresnan.net; Website: http://home.bresnan.net/~curranm/

The Laramie Astronomical Society and Space Observers (LASSO)
Email: roten@lariat.org; Website: http://www.lariat.org/LASSO/

Next year's Weekend Under the Stars will be August 16, 17, 18, 2012
For updates check the CAS website http://home.bresnan.net/~curranm/

Registration Fee is $15.00 per person aged 13 and over
(12 and under free)

Events For Registered Guests (See Schedule inside)

Observing
Jelm Tour Friday (limited participation)
Sky Tour
Guest Speakers
Group Photo
Door Prizes

Thank you for coming this year. We hope you ll enjoy the view.

WUTS Star Party Information

Registration Fee: $15 per person, 12 years old and younger are free

Guest Speaker Saturday 4 PM:
Dennis Web author of “The Arp Atlas of Peculiar Galaxies”

Door Prizes: Saturday 6:00 PM
You receive one Ticket with each $15 registration fee the other one goes in the can
Door Prize drawings start at 6:00 p.m. sharp by the registration booth
You must be present to win a door prize
Door prizes limited to people at least 13 years of age
Please send our donors a thank you email by visiting our website:
http://home.bresnan.net/~curranm/donorlist.html

WUTS Souvenirs

2011 Astronomy Calendar $10.00
2011 WUTS T-shirts $12.00

Forest Service Rules

No fires or campfires are allowed.
Smoking permitted only in cars.
Remember Fire Danger is Always HIGH!!!

Star Party Rules and Manners

Lights out by 9:30 p.m.
Quiet time in the morning until 9 a.m.
Take ALL of your trash with you (and everything else you brought).
Please keep an eye on young children there are a lot of scopes setting around.
Please keep your pets on a leash and away from other people’s property.
Keep pets on a leash at all times.
Pets must be kept in or tied up after dark. Even on leashes they are dangerous for the many people walking around looking through scopes.
Smoking permitted only in cars or inside your RV.
USE RED FLASHLIGHTS!

Your Cooperation Is Much Appreciated!!!

WYOMING SKIES

Hello and welcome to Foxpark! We hope you enjoy this year's 21st Annual Weekend Under the Stars. This will give you a brief tour of the skies that includes things you may see with the naked, as well objects you might want to observe with binoculars or telescopes.

Twice each year, the Milky Way swings overhead, arching from north to south. With it come the brightest stars and constellations of the year. What we call the Milky way is actually one of our spiral arms. Spiral arms are always bright because they contain brighter stars, open star clusters and bright nebula. In the winter, we witness the glories of Orion, Taurus, Gemini, and Canis Major. Summer skies brings the brilliant stars of Vega, Deneb, and Altair and the bright constellations of Cygnus of Sagittarius.

If you look directly overhead about three hours after sunset, one star will dominate all others. This is Vega in the constellation Lyra. Just to the east of Vega is Deneb in the tail of Cygnus the Swan. Lower in the sky you will find Altair of Aquila the Eagle. Together they form a sweeping right triangle known as the Summer Triangle, perhaps the best know landmark in the Summer Skies.

The Summer Triangle is an unofficial star group like the Teapot (Sagittarius), but it is widely recognized by observers. The brightest of the three stars in the triangle is Vega in the constellation Lyra. Look for a little parallelogram of stars between Vega and Altair. This will be Lyra. The Sun and the Solar System is moving towards a spot in the general direction of Vega at a velocity of 12 miles per second. Known as the Solar Apex, it would take the Sun over 450,000 years to reach Vega at this velocity, if we were moving directly towards it.

Vega has a small bluish companion star of about 10th magnitude, about one arcminute distant but there is no real connection between the two stars. Perhaps more difficult to see is another optical companion of about 12th magnitude about 54 arcseconds from Vega. Vega is a blue-white giant about 27 light years away and the fifth brightest in the sky. At the moment Vega is directly overhead, the brightest star in the sky, Sirius, is more or less under your feet, hidden by the Earth you are standing on.

Northwest of Vega is the famous double-double star known as Epsilon Lyrae. It is a quadruple star system made up to two close binary stars. To the naked eye, Epsilon appears as a single star. Binoculars reveal two stars. A small telescope will show that each of these components is itself a double star, a total of four stars bound together in an endless dance of Newtonian gravity.

Southwest of Vega and part of the Lyra parallelogram are Beta Lyrae and Gamma Lyrae. A telescope directed almost directly between them will reveal a delightful object known as M57, the Ring Nebula. The nebula is a spherical shell of gas blown off by the star as part of it's death throes. This planetary nebula is one of the most famous and beautiful objects in the sky. At the very center is a very hot blue dwarf star, the naked core of the star that is left behind after throwing off it's outer layers to space. It may be on its way to becoming a white dwarf. Meanwhile, the envelope of glowing gas will continue to expand, adding it's enriched remains to the interstellar medium. While admiring M57, try to spot the star at the center, but don't feel bad if you can't see it - it's not very bright shining at 15th magnitude.

During August, the Earth, in it's orbit around the sun, passes through the debris of a defunct comet known as Swift-Tuttle. The material of that comet is now spread out in an elliptical orbit reaching far out into the solar system. As the Earth passes through this stream of material, particles enter the Earth's atmosphere and are vaporized by friction. This is known as the Perseid meteor shower and it peaks in the number and frequency of meteors on August 12th, about 2 weeks after our Foxpark weekend. Meteor showers take

their name from the part of the sky that they seem to radiate from, in this case, the constellation Perseus. Perseid meteors may appear anywhere in the sky, but most can be traced back to the their radiant point in Perseus. Although we are well before the peak, you may still see a Perseid in the morning hours, when the Earth has turned so that we are facing head-on into the stream.

High overhead and flying south along the stream of the Milky Way is Cygnus the Swan. Like other migratory birds the swan flies between Vega and Altair. Cygnus is one of a handful of constellations that really look like what they are supposed to represent. Just remember that swans have long necks and short tails, and it is easy to find it among the summer stars. Also helpful in finding Cygnus is to picture a kite (the old-fashioned kind, not the modern types that come in all shapes.) The brightest star in the kite is Deneb, the Arabic word for tail , and is at the top of the kite. Cygnus is often called the Northern Cross. At Christmas time, the constellation stands upright in the evening on the northwestern horizon looking distinctly like a large cross.

The summer Milky Way near Cygnus is thick with stars and nebula. In this river of stars are many well-defined star clusters. M29 is about 1.7 degrees south-southeast from Gamma Cygni. In small telescopes it appears as a trapezoid-shaped knot of a dozen or so 8th and 9th magnitude stars. East-northeast of Deneb is M39, easily found in binoculars but appears very large and sparse through the telescope.

Just south-southeast of Epsilon Cygni is a complex of lace-like gaseous nebulae consisting of NGC 6992-95, 6960, and 6979. Together they form one of the most striking objects in Cygnus known as the Veil Nebula. It appears as a faint curved arc like a ghostly white rainbow, over one-degree in length. A very dark sky (like Foxpark), a clear night, and a wide-field eyepiece of low power are essential for a full detection of this object. Also helpful is an O2 filter to bring out the delicate filaments of the nebula. Some observers have reported seeing the brightest part of the Veil through binoculars due to the low magnification and great light gathering power of such an instrument. The most agreed-upon origin of the Veil nebula is a supernova explosion in the distant past.

If you have binoculars, scan Cygnus. The number of faint stars in its body will dazzle you. Near Gamma Cygni the stars are clumped in clouds . Below Gamma the Cygnus Star Cloud marks one the spiral arms of our galaxy. The Sun is located just at the inner edge of this arm, which is known as the Cygnus Arm; we are off in an area called the Orion Spur. Also near Gamma begins the Great Rift, a thick band of obscuring dust and gas that divides the Milky Way from here to Scorpius. Only a little imagination is required to see the whole spiral arm of our Galaxy!

Just three degrees east of Deneb lies the North American Nebula, which may be detected with the naked eye as a region of increased brightness in the Cygnus Milky Way. Binoculars show an irregular glow with the North American shape becoming unmistakable on a clear night. A telescope with a wide-angle eyepiece will provide the best view. The Gulf of Mexico stands out clearly and the Pacific coast can be traced from Canada to Mexico. Further out in the Atlantic stands a detached island often called the Pelican Nebula . The geographic illusion is created by clouds of glowing gas obscured at the margins by darker masses of opaque matter. Although the glowing gas of the North American Nebula appears thick it is actually rarified with only a dozen or so hydrogen atoms per cubic centimeter considered a near-perfect vacuum on Earth. Compared to the standard abundance of interstellar space, the gas in this nebula is thick.

Before leaving Cygnus, take a look at the head of the Swan. Beta Cygni is a binary system known as Alberio. One of the most beautiful double stars in the sky, the telescope will reveal one star to be blue, the other yellow. Seen in proximity, the contrast is remarkable. The colors are especially

prominent if the telescope is a little out of focus. The two stars appear to be very far apart for a binary star system, and no motion has yet been observed of one star about the other.

Altair is the third star of the summer triangle. It lies in the constellation Aquila, between Vega and Deneb in brightness and only about 16 light years away. Altair is a white main sequence star, about 1 and 1/2 times larger than the sun and 11 times brighter. Just north of Aquila; in the dark sky between the Swan and Eagle are two constellations that are not well known. The first is Sagitta the Arrow. The name is related to that of Sagittarius the Archer. Perhaps the arrow was shot at the eagle by Sagittarius and missed it's target! The second constellation is Delphinus the Dolphin.

Vulpecula the Little Fox would be a strong contender for the least interesting constellation except for one telescopic object known as M27, the Dumbbell Nebula. The name is derived from the shape of the nebula, which appears as two great clouds in contact. The object is a typical planetary nebula like the Ring Nebula in Lyra.

The "Coathanger Cluster" (also known as Brocchi's Cluster and more formally as Collinder 399) is an almost startling sight when encountered in the view of a small telescope. Visible to the naked eye in the constellation Vulpecula. Commonly taken as a real cluster, it isn't, and thereby provides a strong lesson about statistics and about the difficulties inherent in cluster research. The grouping, in the heart of the Milky Way, is entirely a coincidence. Its stars range from 200 to 1100 light years away. Moreover, the stars are not moving together, but are going off in all sorts of different directions. One of the most difficult tasks in dealing with real clusters is "membership." What stars really belong, and what stars are just in the way? The only way to tell is through time-consuming measures of distance and motion. Nevertheless, the "group," with its strong color contrasts (caused by differing temperatures, cooler stars more red and hot stars are blue), is quite lovely to look at and truly looks like an old fashioned coat hanger.

The constellation Hercules is an ancient one, going back to ancient Sumerians. We now know the figure as Hercules, the son of Zeus and the mortal woman Alcemene. There are many stories of Hercules that associate him with other constellations like Leo the Lion, Hydra the Water Snake, and Cancer the Crab, all were creatures defeated by Hercules in the course of completing the famous twelve labors.

The great jewel of Hercules is a magnificent globular star cluster known, quite appropriately, as The Great Star Cluster in Hercules, and is the of these remarkable objects in the northern skies. On an exceptionally starry night you might see the cluster is a fuzzy star near the limit of vision. Through a telescope, the fuzzy star explodes into a spectacular ball of a thousand stars. Listed as M13, this is one of about a hundred globular clusters that have been recognized. They are distributed around the Milky Way Galaxy in a great spherical halo. A typical cluster is about 150 light years across and contains hundreds of thousands of stars. The brightest globular cluster bears the name of Omega Centauri and might be seen from the southern latitudes of Florida, South Texas, or Hawaii.

For every object we've discussed here, there are thousands of others just waiting to be discovered. If you're armed with a good sky atlas or database, you can spend many hours finding many wondrous things up there.

Highlights of WUTS Past
A Stroll Down our Cosmic Memory Lane

1st FRASC, 1989 we had 5 people here with 63.5 inches of aperture. The most memorable sight that year was Comet Borsen-Metcalf with 2 distinct tails.

2nd FRASC, 1990 we had 50 photon seekers attend with 290 inches of aperture. We had a Lunar occultation of Jupiter early in the morning and Comet Levy was naked eye.

1st WUTS, 1991 we had 12 people attend and we didn't count the aperture. We had an awesome aurora all night but it was very, very cold.

2nd WUTS, 1992 our numbers rose to 67 astronomers and 288 inches of aperture.

3rd WUTS, 1993 we had 70 people here with 170 inches of aperture. The first large scope showed up; a 25 inch scope. We had some foreign observers for the first time that year.

4th WUTS, 1994 we had 85 people attend with 381 inches of aperture. There were faint spots still on Jupiter from Comet Shoemaker-Levy 9 impacts; Cool! It was a year for comets with Comet D Arrest naked eye and Comet Hale Bopp a fuzzy spot but still a thrill to find.

6th WUTS, 1996 we finally had over 100 in attendance with 152 cosmic thrill seekers. We had 618 inches of aperture. An attendee from Luxembourg was extremely excited at seeing such wonderful skies. He was so fun he kept saying "it looks just like a picture in a book". The guy wore shorts all night.

7th WUTS, 1997 we had 180 cosmic gazers this year with 740 inches of aperture.

8th WUTS, 1998 we finally got over 200 attendees but failed to reach 1000 inches of aperture. We had 916 inches of glass and mirrors on site which seemed to take care of many hours of observing. We had an incredible rainbow that gave way to an incredible night of stars.

9th WUTS, 1999 we had 225 people show up that year and reached an amazing 1207 inches of aperture. The Perseids were so great this year we were seeing about 4 meteors a minute. Sweet.

10th WUTS, 2000 with 234 people and 1212" inches of aperture. One of the highlights we enjoyed seeing a recently broken apart Comet Linear. It was only visible right low in the west but how cool to see the multiple pieces of a comet.

11th WUTS 2001 we dipped below 200 again with 185 people but got see see an amazing fireball visible at both WUTS and Jelm Mountain Observatory. We had 1309 inches of aperture that year.

12th WUTS 2002 we had 231 people with 1553 inhces of aperture. We had an awesome pass of the ISS/Shuttle visible through clouds.

13th WUTS 2003 we had 167 people with 1310 inches of aperture. We moved to Dry Creek because of forest fire at Fox Park.

14th WUTS 2004 with 250 people and 1454 inches of aperture. We had 5 great nights of observing, but we had awful dust devils during the day. There were sightings of aliens everywhere. There are PHOTOS to prove it too.

15th WUTS 2005 we had 170 people with 1220 inches of aperture. Due to high gas prices, and bad weather our numbers were down but we had several great nights of stars.

16th WUTS 2006 we had 159 people with 1064 inches of aperture. The skies were great and the weather was actually warm at night.

17th WUTS 2007 we had 158 peering in to the nighttime sky and 1257 inches of aperture. Another year of great skies.

18th WUTS 2008 we had 208 attend and 1300 inches of aperture. Great Skies night after night, and a rain storm on Saturday afternoon followed by a beautiful red sunset.

19th WUTS 2009 we had 201 star gazers and 1355 inches of aperture and night after night of incredibly clear and dark skies.

20th WUTS 2010 was cancelled due to beetle kill.

21st WUTS 2011 we had 167 registered guests, 1174 inches of aperture and got in some amazing observing. Friday was the best. Many regulars were glad to be back enjoying those incredibly dark skies. The Aquarids were putting on quite a show for us.

Door Prizes - Yippee!!!

Even if you don't win a door prize be sure to visit our donor list. Take the time not only to shop their websites but send them an email letting them know how much you appreciate them supporting our star party. If you do win a door prize please take the time to email the company or person that donated your prize. Donor's websites can be found at http://home.bresnan.net/~curranm/donorlist.html

Donor In Order Received	Door Prize (As of July 1)
JMI	2 - $50 Gift Certificates
MrStarGuy, Inc / Vixen Optics	LV8-24 Click Stop Eyepeice
Oberwerk Giant Binoculars	8x56 Oberwerk Binoculars
LASSO	Star Atlas, 2 - Flashlight, 32mm Plossal Eyepiece
Ashland Astronomy Studio	Poster: Stars of the Northern Hemisphere
Astrozap	2 - $50 Gift Certificates
Scope City	2 - $25 Gift Certificate
Star Date	Online Star Subscription (1 year)
Kalmbach Publishers	1 Year subscription to Astronomy Magazine
Celestron	3" First Scope (Will be Kids Prize)
Agena Astroproducts	4mm Plossal eyepiece
Explore Scientific	14mm 100 degree nitro purged WP eyepiece
Starry Night	Starry Night Pro Software
Oceanside Photo & Telescope	15mm & 20mm Superview Eyepieces
CAS	Telrad with Dew Shield, 2012 Astronomy Calendar
Tele Vue	1.25" 2X Barlow
Astrographics	2 - Hubble Telescope Calendars for 2012
Software Bisque	$99 Gift Certficiate
Planetary Society	T shirt and 1 year subscription to the Planetary Society
Astrosystems	$50 Gift Certificate
Theresa and Doug Wolford	Astro Quilt
Rock Springs Astronomy Club	4 M 45 T-shirts

WUTS AT A GLANCE

DAY	ACTIVITY	TIME	LOCATION
THURSDAY	REGISTRATION	12:00 PM TO 6:00 PM	REGISTRATION BOOTH
	OBSERVING	9:30 PM TO ???	ON SITE
FRIDAY	REGISTRATION	12:00 PM TO 6:00 PM	REGISTRATION BOOTH
	JELM TOUR (LIMIT 0F 25 SEE ROBERT ROTEN)	LEAVE AT 1 PM (YOU MUST SIGN UP FOR THE TOUR AND ARRANGE FOR YOUR OWN RIDE)	LEAVE FROM REGISTRATION BOOTH
	SKY TOUR	9:30 PM TO 10:00 PM	BY THE REGISTRATION BOOTH
	OBSERVING	9:30 PM TO ???	ON SITE
SATURDAY	REGISTRATION	12:00 PM TO 4:00 PM	REGISTRATION BOOTH
	GUEST SPEAKER	4:00 PM	REGISTRATION BOOTH
	GROUP PHOTO	APPROX 5 PM	AFTER GUEST SPEAKER IN CENTER FIELD
	DOOR PRIZES	6 PM SHARP	REGISTRATION BOOTH (MUST BE PRESENT TO WIN)
	OBSERVING	9:30 PM TO ???	ON SITE