Be looking for a notice on a change in location, and possibly day & time, for our next indoor meeting.

If we make a change, you will receive a special mailing giving the details. If you don’t get anything, then we’ll meet at the same time and place as usual!

Monthly Meeting Notes

May’s meeting featured a talk by Tom Fleming, a member of Sidewalk Astronomers and a 7th grade teacher at North Oaks Middle School. Tom treated us to a number of photos of the sky that he has taken over the years from the various locations where he has lived. Additionally, he put in a strong plug for the Association of Variable Star Observers and for solar observing. It was a good talk to show how astronomy can take a lot or a little of your time!

A procedural reminder on your Sky & Telescope and Astronomy renewals: When you are notified by the magazine that it is time to renew your subscription, you need to send the renewal notice and your check to FWAS, care of the Treasurer. Also make the check out to FWAS, not the magazines. To get the discount, the magazines need to get it from the club.

Next month’s program will be brought to us by our own Sallie Teames. She will share with us her presentation on “Signs of Eta Carinae Outburst in Artifacts of Ancient Bolivia” that she gave to AAVSO in Hawaii.

For those of you who haven’t been, each year at the Texas Star Party, there is an observing list developed with some specific theme. This year’s observing list was called “Seeing Double”, featuring a list of galaxies that had two in the same field of view. Many or most of these were actually interacting, and there was another more difficult list of advanced interacting objects (that were too tough for me and my little ole’ 11” dob!). The Tadpole shown above is an example of such an interaction.

In addition to the observing lists, there were companion talks during the afternoons/evenings on what the objects are and how they behave. These were quite interesting and gave a lot more meaning to the faint fuzzies sitting there in my eyepiece at 3:00 in the morning!

I would like to credit the guys at TSP who gave these presentations and did the excellent lists, but

(Continued on page 4)
Texas Star Party 2002

TSP 2002 was a pretty good year. Two nights were really good, two nights were totally socked in by clouds, and the rest were manageable. The biggest problem was a high pressure cell sitting up over New Mexico, funneling clouds up from the Pacific through Mexico over Fort Davis too much of the time. On the “manageable” nights I was able to keep my scope gainfully employed by working around the cloud cells that would generally hug the horizons, and sometimes make a pass through Ursa Major.

On one of the socked in nights, bored amateur astronomers conducted a balloon launch, with helium balloons containing little flashing red battery-powered LEDs—really pretty entertaining to watch as they drifted off toward Ft Davis, forming random patterns that the crowd declared to be various constellations. I think there was a reported increase in sightings of the Marfa Lights that night….

There were about 600 registered attendees this year, down a bit from last year, making it a little roomier on the fields. FWAS was well-represented by:

- Richard Brown
- Steve Gray
- Don Hopkins
- Barry Lieb
- Don McFarlan
- George Parker
- Tom Wideman

Additionally, our own Ron Dilulio gave a talk one afternoon on robotic observatories, based on his experience with UNT’s new facility.

Consider attending next year!
The Planets:

**Mercury:** Although low, you can catch Mercury in the east-southeast about an hour before sunrise during the last two weeks of June.

**Venus:** Venus is glorious this month in the west-northwest. On June 1, Venus is slightly to the lower right of Jupiter, moving to Jupiter’s upper right two days later. Venus is certainly the brightest object on the viewing scene this month!

**Mars:** You have to be quick to catch Mars low in the western sky during the first hour after sunset.

**Jupiter:** Sharing the west-northwest sky with Venus, Jupiter is found at nightfall. You can view this lovely planet for about 2 hours after sunset at the beginning of June; but, by the end of the month, that viewing time has decreased to less than an hour.

**Saturn:** The ringed planet is mostly lost in the glare of the sun this month, but you might catch a glimpse of it near Mercury early on the morning of June 30.

**Eclipse Time!**
Sunset watchers will have an added bonus to their viewing this month as the Moon passes in the front of the sun on the evening of JUNE 10. The moon’s angular size isn’t large enough to provide a total eclipse, but watchers in Dallas-Fort Worth will see about 60% of the sun’s light blocked. The eclipse begins at 7:27 PM and ends at 8:22 PM in our area. REMEMBER, NEVER LOOK DIRECTLY AT THE SUN. Special filters are required to view the sun safely! Safe viewing will be offered throughout our area, including The Fort Worth Museum of Science and History.

**Summer is Here!** The summer solstice officially arrives at 8:24 AM (Central Daylight Time) on June 21, the longest day of the year. On this day, the sun reaches its highest point in our sky.

**Constellations:** Boötes, Circinus, Libra, Lupus, Ursa Minor

Looking for a Little More? If this Skyline whets your appetite, try this website: skymaps.com/downloads.html. It offers a two-page pdf brochure that you can print out for free. It has a basic skymap and short lists of visual, binocular, and small telescope objects. It is really good—check it out!
Interacting Galaxies ... continued

I am afraid as I write this 3 weeks later I don't have their names, and I wouldn't have their presentations either anyway. So... to capture the basic information, I did a quick internet search and found the following 2 sources that do an excellent job of capturing the essence of this subject! The first article gives a quick explanation of galactic interaction, and the second provides an animation you can watch in a few seconds instead of a few hundred million years!

High-speed encounters between galaxies will leave the galaxies largely intact, but will result in tidal distortions such as tails and bridges. The Whirlpool Galaxy (M51), for instance, is connected by a tidal bridge of stars to a smaller neighboring galaxy.

Head-on encounters are rarer than glancing encounters. If a small galaxy runs straight through the middle of a large spiral galaxy, a "tidal wave" of stars and gas will run outward in the disk of the spiral galaxy. The result is a ring galaxy, in which the most prominent feature is the ring-shaped tidal wave of stars. A famous ring galaxy, known as the Cartwheel Galaxy, is shown at right. The interloping galaxy which passed through the middle of the Cartwheel Galaxy is one of the two galaxies on the right - no one knows which. Note how blue the ring of the Cartwheel Galaxy is; that means it's a site of current star formation, with lots of young O & B main sequence stars.

Low-speed encounters between galaxies result in mergers. Two separate galaxies will join together to form a single elliptical galaxy. The entire merging process takes hundreds of millions of years, so galaxies are seen caught in the act of merging. The two galaxies shown below are known as the "Antennae" galaxies. They are in the process of merging with each other; note how tidal forces have warped them into asymmetric shapes. The blue areas within the galaxies are regions where star formation is being triggered.

The Milky Way Galaxy and the Andromeda Galaxy are currently approaching each other at a speed of 300 km/sec. If they are on extremely elongated orbits, they will collide with each other in 3 billion years or so, merging to form a giant elliptical galaxy. (If their orbits are more nearly spherical, they will pass by each other with only minor tidal distortions).

When a large galaxy encounters a smaller one at low speeds, the smaller galaxy is "cannibalized". That is, the stars of the small galaxy are incorporated into the larger one, with only a minimal change to the structure of the larger galaxy. The Milky Way Galaxy, it seems, is in the early stages of cannibalizing the Magellanic Clouds.

In this scientific visualization, two spiral galaxies are set on a collision course. As one slices through the other, both are disrupted. The tidal forces of gravity produce long tails of material streaming away from the collision. The central regions relatively quickly fall together and merge. The visualization is based on research data from a supercomputer simulation, with stars shown in yellow and gas shown blue. Time passes at about 10 million years per second, lasting a total of about 500 million years. Such a collision may occur for our Milky Way Galaxy and the neighboring Andromeda Galaxy in about five billion years.

Visualization by Frank Summers (Space Telescope Science Institute).
Simulation by Chris Mihos (Case Western Reserve University) and Lars Hernquist (Harvard University)
Lake Whitney - This is a public telescope observing opportunity. Check whitney-astro.com/ for details.

Grand Canyon Star Party - Where else can you go to keep the family happy and occupied all day, and the dark nights will keep even the most jaded of astronomers smiling all night long? We have plans to continue last year's successful North Rim version as well, so you have your choice of rims. http://www.tucsonastronomy.org/gcsp.html

May Star Walk at Copper Breaks .... Fred Koch

The next Sun Fun and Star Walk at Copper Breaks State Park south of Quanah, Texas is June 1st.

Last month we were successful in initiating the Sun Fun, which consists of solar observing near the Park Headquarters from 1 to 3 PM the same day as the Star Walk. We are using both Baader white light filters and Coronado hydrogen alpha filters and in the latter case enjoyed seeing some dramatic prominences.

The evening Star Walk has relocated to the northern side of the Park to the Big Pond Campground. This proved to be a much darker site and combined with the new GlareBuster light fixtures within the Park has greatly enhanced already good dark skies.

The format remains the same. The public is treated to an introductory program of the night sky, making use of a green laser pointer, and then the public disperses to the various telescopes run primarily by member of the Dallas and Fort Worth astronomy clubs. As always, the success of the program for the public benefits greatly by participation of Metroplex members. When the public departs generally after two to three hours the instruments are now for the use of members for the rest of the night as desired.

The following instruments are expected to be among those available. Obsession Dobsonians ranging from 15" to 25" at this time. Three of these nine instruments currently make use of Equatorial Platforms.

There are two refractors: Televeu 101 and 102. there are several Orion 10" Dobs. There are now two giant Fujinon 25 X 150 binoculars each with its own parallelogram mount.

Newly arrived is a StarChair from Australia. Sitting with binoculars supported on a mount in front of the observer's face, movement is via a joystick and power by a 12 volt marine battery. This chair allows the observer to lie on his or her back when observing the zenith. It is now up and running and will be put into public use at the June 1st Star Walk.

Individuals interested in participating should contact Richard Brown at RABrow@aol.com regarding instrument selection and assignment. Copper Breaks State Park should be contacted separately and the individual identified as a Starguide in order to receive two free nights of camping within the Park. And to enjoy as well the hospitality of a Saturday night dinner at the home of the Park Superintendent. For the Starguides especially, we seek to make the occasion a social event as well as one devoted to astronomy. We welcome and encourage member participation in this growing event. Either he or I will be glad to answer any questions. The Park can by reached at (940) 839-4331 or at cbspsrcaccess.net.
Nowadays Boötes is generally considered to be a Herdsman, as he eternally shepherds the stars around the North Pole. The constellation was known in antiquity, with the first recorded appearance being in Homer's *Odyssey*. In Book V Odysseus sails his ship by the stars, using the Pleiades, the Bear, and Boötes ("which set late") to reach his destination.

Some constellations are known for their deep sky objects; others for an interesting variable or perhaps an attractive binary. Boötes has few deep sky objects of any interest. Nor are its variables particularly noteworthy. However the constellation does have one of the finest collection of double stars, some of which are described below.

### Deep Sky Objects

**NGC 5248** - About 4-6' long by 2-3' wide, oriented NW-SE. Sharply concentrated to the center, and a bright stellar nucleus. At times, the arms of this galaxy appear to be slightly curved at the ends.

**NGC 5466** - This lone globular cluster in Bootes is not particularly impressive. It is a milky patch about 8' in diameter, with a faint sprinkling of stars across its face.

**NGC 5660** - A very faint patch of light 2-3' in diameter. Barely visible as a brightening of the background sky.

**NGC 5676** - 3' long by 1.5' wide with tapering ends, oriented NNE-SSW, and a broad concentration to the center.

**NGC 5689** - 2'x0.75', oriented ENE-WSW, sharply concentrated to the center and a non-stellar nucleus.

### Double Stars

**Epsilon Bootis** - A very pretty double star, although rather tough to split. The primary is golden, and the companion in blue.

**Xi Bootis** - Easier to split, and a very pretty yellow and red-orange pair.

**Kappa Boötis** is a gorgeous double with colour contrast; the primary is yellow and the companion a deep blue.

**Mu Boötis** is a triple system. AB are fixed. The component B has a close companion C (magnitude 7.6) which is a rapid binary.

**Pi Boötis** is a pleasant binary of two blue-white stars.

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**Nasa Notes ..... Jim Timmons**

UP, UP, and AWAY (International Space Station) - Mission STS-111, with the Space Shuttle Endeavor, will launch at the end of May to exchange crews of the ISS. The Expedition Four Crew of Yury, Dan and Carl, who’ve been on station since December 7, 2001, will be replaced by Crew Five with Valery, Peggy, and Sergei. Leonardo (the logistics carrier) will be bringing almost three tons of supplies and equipment on its third visit to the station. The Endeavor crew will also be delivering a mobile base system for the station’s robotic arm and a new joint for the arm.

SPEEDS HIGHER THAN THE INSIDE LANE OF 820 (TRACE & SOHO) - Recent observations from the Solar and Heliospheric Observatory spacecraft (SOHO) and the Transition Region and Coronal Explorer spacecraft (TRACE) have shown winds and storms in the solar atmosphere moving at speeds up to 200,000 miles per hour. Researchers had thought that coronal loops of electrified gas or plasma were trapped and enclosed by the magnetic fields of the corona. The new findings suggest the loops are hypervelocity currents of plasma instead of static plasma-filled structures.
FWAS Membership Info

FWAS Officers:
President - Harry Bearman  
817-294-8330, president@fortworthastro.com
Vice President - Danny Arthur  
817-732-4702, vicepresident@fortworthastro.com
Sec/Treas - Tres Ross  
817-732-0142, secretary@fortworthastro.com
Chairman, Bd of Trustees - Becky Nordeen  
817-428-0881, chairman@fortworthastro.com
Vice Chairman - Ron DiIulio  
817-249-3092, vicechairman@fortworthastro.com

Interested in charting your own constellations, targets, and evening observing plan?

Try some of these sites. Some are free, like Hnsky and Cartes du Ciel. (Yes this was written in French, but they have an English version.)

MegaStar 4.0  
www.willbell.com
SkyMap Pro 8  
www.wwsoftware.com
Cartes du Ciel 2.71  
www.astrosurf.com/astropc
Hnsky 2.1  
www.hnsky.com/
Sky Chart III  
www.southernstars.com
DeepSky 2000  
www.deepsky2000.net/
Distant Suns  
www.distantsuns.com
Starry Night Backyard  
www.starrynight.com

FWAS Meeting Info
- FWAS meets at 7:00 PM on the third Thursday of the month at the Ft. Worth Museum of Science and History, 1501 Montgomery Street. Guests and visitors are always welcome!

FWAS Observing Site - The observing site in Wise County is open to members of FWAS at all times. Guests of members are always welcome. Six great telescopes are available for members' use: two 12" Dobs and four 10" Dobs. Dark Sky etiquette is strictly enforced, except on guest observing nights!

FWAS WebSite - fortworthastro.com:
- Membership Info
- Officers
- Astrophotos
- Observing
- Links - Local weather, etc!
- Message Board

FWAS E-Group - send a blank e-mail to fwas-subscribe@yahoogroups.com to subscribe. Post messages to the group by sending e-mail to fwas@yahoogroups.com. Any message sent to fwas@yahoogroups.com will be automatically sent to all members of the list.

Prime Focus - The FWAS newsletter is published monthly. Letters to the editor, articles for publication, photos, or just about anything you would like to have included should be sent to Steve Gray at PrimeFocus@FortWorthAstro.com. Deadline is the Saturday after the Indoor meeting.

FWAS Annual Dues - $30 for adults, $15 for students. Send dues C/O Tres Ross at the FWAS PO Box return address.

Discount Subscriptions Available: Sky & Telescope ($30), Astronomy ($30). Send subscription renewals C/O Tres Ross at the FWAS PO Box return address. For magazine subscription renewals, please include the magazine's renewal slip. Note that a Sky & Telescope subscription through the club entitles you to 10% off purchases at the Sky & Telescope on-line store!

Astronomical League Membership - Your FWAS membership also enrolls you in the Astronomical League. This makes you eligible for various observing certificates and you get their quarterly magazine, The Reflector.

Observing Site Reminders:
- Sign the logbook in the clubhouse.
- Put equipment back neatly when you’re through.
- Leave a log note if there is a club equipment problem and please call a club officer to let them know!
- Turn out the bathroom light and close the door tightly!
- Last person out, please ...  
  - Check all doors and lights.
  - Make sure nobody left anything out.
  - And chain the gate.
- Maintain Dark Sky etiquette
- Turn out those headlights at the gate!!
## Event Horizon for June 2002

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<td><strong>FWAS Guest observing is the Saturday closest to Sol</strong></td>
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**Editor's Note:** The star banners indicate star parties. Be sure to check with the sponsor for details.

Ft Worth Astronomical Society  
PO Box PO Box 471162  
Fort Worth, TX  76147-1162  

PrimeFocus@FortWorthAstro.com

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Next FWAS Indoor Meeting—Thursday 6/20  
at 7:00PM the Ft Worth Museum of Science & History (May be revised—stand by for updates)