

★ **STAR STUFF** ★

The Newsletter of the Ford Amateur Astronomy Club



October 2001
Volume 10 Number 7

Editor: Jim Frisbie

^^-- Welcome, new STAR STUFF Editor Jim Frisbee --^^

In This Issue:

- New Features:

- **B&W Photos:** We are attempting to enhance Star Stuff reproduction techniques so that readers can enjoy quality b&w photo reproductions.
- **Letters to the Editor:** This is your chance to feed back on what you like, what you don't like, and what you would like to see in STAR STUFF. Please send you letters and suggestions to Jim Frisbie via email: w8tu@peoplepc.com
- **Swap & Shop:** Yes we have had "For Sale" items listed in the past, but very few and far between. I encourage you to check your inventory and send me information on what you would like to buy, sell or trade. Please send you listings to Jim Frisbie via w8tu@peoplepc.com

- Simple Astrophotography by Clayton Kessler

Clay has agreed to share some his expertise on astrophotography with us. His well written article explains basic techniques and has helpful hints on how to get started in astrophotography. Black & white samples of his work have been included for your enjoyment. Color photos can be found in the online edition of STAR STUFF. In addition to beginners, perhaps intermediate and advanced astrophotographers may find some useful information in pursuit of a new area for taking pictures.

- Pointing Accuracy by Jim Frisbie

Although this article is written around experiences with an LX-200, the basic principle of concentricity between mechanical and optical axes can be applied to improve pointing accuracy on most any telescope.

- Halloween Beginners's Night

Please see the flyer on page 7, bring a newcomer to astronomy and join us on Saturday, October 27th.

STAR STUFF is a monthly publication of the Ford Amateur Astronomy Club, an affiliate club of the Ford Employee Recreation Association.

**Ford Amateur Astronomy Club
P.O. Box 7527
Dearborn MI 48121-7527**

<http://www.boonhill.net/faac>

Submissions to STAR STUFF are welcome Please write to the address above or contact the editor:

Jim Frisbie
via tele #: 734-453-1422
or email: w8tu@peoplepc.com

Dead line is the 15th of each month for the following month of publication.

Officers:

President	Dan Kmiecik
Vice President	John Ford
Secretary	Mike Kruskie
Treasurer	Mike Bruno

General Meetings:

The Ford Amateur Astronomy Club holds regular general meeting on the fourth Thursday of each month (except the combined November/December meeting held the first Thursday of December) at 5:00 PM in conference room 1491 in the Ford Credit building in Dearborn, Michigan

Observing:

The Ford Amateur Astronomy Club observes at Spring Mill Pond within the Island Lake State Recreation Area near Brighton, Michigan. The club maintains a permit for after-hours access. Weather permitting, the club observes on Friday nights, Saturday nights, and nights before holidays.

Club Information:

Observing schedules and additional Club information is available by calling the Observing Hotline at: (313) 390-5456 or via the Ford Intranet: www.be.ford.com/astro/faac.html or the public Internet: www.boonhill.net/faac.

Club Membership:

Membership in the Ford Amateur Astronomy Club is open to Ford employees and non-employees. Write or call for an application.

Annual - New Member: \$25; Renewal: \$ 20 (before Jan 31 of each year)
Lifetime - \$ 150

Membership includes:

A subscription to the STAR STUFF newsletter and the quarterly newsletter the REFLECTOR published by the Astronomical League.

Discounts on ASTRONOMY and SKY & TELESCOPE magazines, after-hours access to the observing site and discounts at selected area equipment retailers.

Magazine Discounts:

Do not send money to FAAC for SKY & TELESCOPE or ASTRONOMY magazine subscriptions. We have a form that you send in with your subscription directly to the publisher to receive a \$10 discount. Pick up a form at the next meeting, or contact a club officer. †

Swap & Shop

Wanted: Orange tube C8 OTA. Please contact: Jim Frisbie @ 734-453-1422.

For Sale: Vixen Polaris Mount with polar scope, dual axis drive set and adjustable wood tripod. Tracks accurately while handles 14# payload. Excellent for small scopes or camera platform. Asking \$340. Contact: Jim Frisbie @ 734-453-1422

Trade: Sky-Watcher 102mm wide field refractor. Comes with dew shield, mounting rings, 6X30 finder scope, lens cap and dust cap. Looking for 8" reflector. Contact Jim Frisbie @ 734-453-1422

Letters to the Editor

I would like to take this opportunity to personally thank Mr. Chuck Boren for his tireless efforts as editor of STAR STUFF. It is sometimes a thankless job that goes unnoticed by many. Chuck has done a excellent job of keeping club members informed of club happenings. Increased work commitments have prompted Chuck to pass the baton. Thanks for your efforts.

Jim Frisbie

Simple Astrophotography

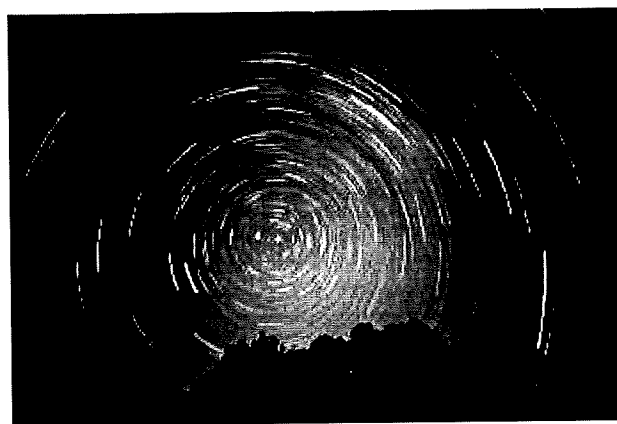
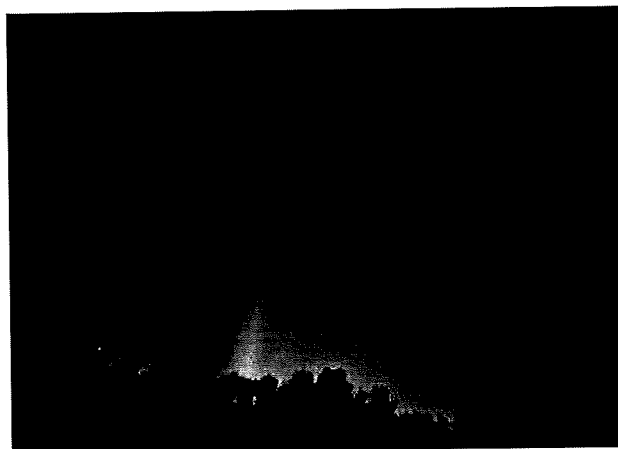
by Clayton Kessler

Almost everyone that owns a telescope gets the desire to take some astrophotos at one time or another. This can be a simple task and provide very satisfying results. While taking long exposures tracking the stars can require some equipment and specialized skills, taking colorful "star trail" photographs, or pictures of the northern lights, requires only a camera and tripod. In fact, taking pictures of the moon or the sun may only require a camera and the telescope that you already have (suitably filtered for the sun), no other fancy stuff required!

There are several common methods of using a camera or camera/telescope combination for astrophotography. These are as follows:

Camera on Tripod:

Your camera is mounted on a photo tripod and a "normal" or "wide angle" lens is used to take non-tracked widefield shots of the sky. This is useful in several ways. A "star trail" shot is a long time exposure that allows the stars to move across the film. This results in a very colorful image of the various stars visible at the time. If you point the camera north or south the curved track of the stars is very apparent. You can also take shorter duration exposures (10 to 30 seconds depending on the lens used) and take very nice constellation shots that show bright stars and very little or no star movement. Photos of the northern lights are also wonderful candidates for the "camera on tripod" method. I like 400 to 800 speed film with a 20 to 45 second exposure for the aurora. Remember to use a "cable release" to trip the camera shutter without shaking the setup.

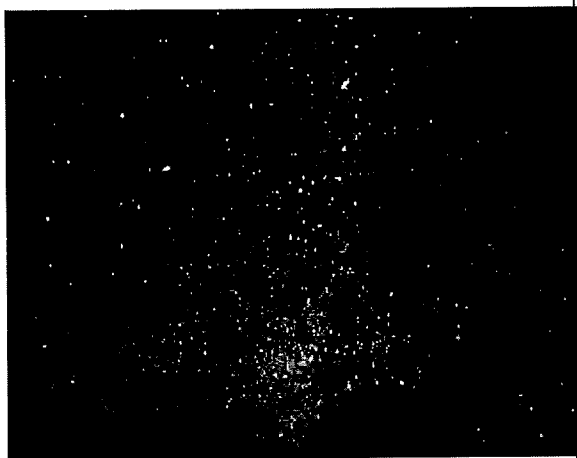
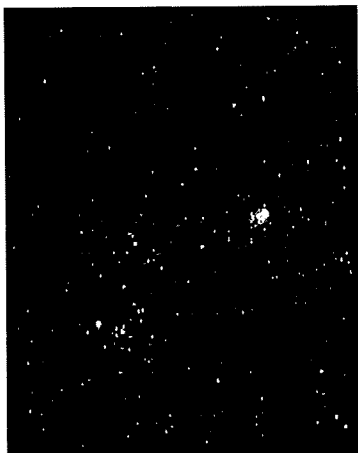


Try this method to get some satisfying shots without lots of equipment.

Camera "Piggyback" on telescope:

Assuming that you have a telescope that tracks the stars in equatorial mode, you can attach your camera to the outside of the scope and use the camera lens to image the sky. This would be a long duration photograph (10 minutes or longer) similar to the "star trails" previously mentioned except the telescope will move the camera to counteract the motion of the earth and the stars will remain pinpoints on the film. A lifetime could be spent taking wonderful astrophotos using this method and various camera lenses. What about those that do not have a tracking telescope? You can build a very simple device called a "Scotch Mount" or a "Barn Door Tracker" and track your camera with this. This is simply two pieces of wood and a sturdy hinge. A small threaded rod is positioned and turned by hand to provide the tracking. The device is mounted on a camera tripod and the hinge is

pointed at the north star. This is a very simple device that can be built for about \$10.00. There are many sets of plans available on the internet, just visit the "Amateur Telescope Makers" archives at <http://astro.umsystem.edu/atm/> and search on "scotch mount" or "barn door mount".



Afocal Projection:

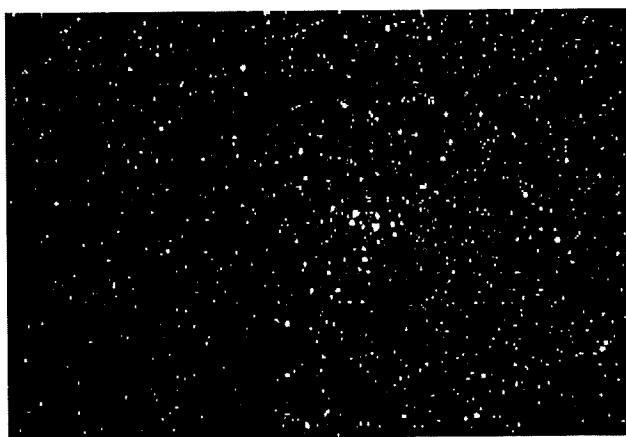
Afocal projection is a method that uses both the camera lens and the telescope eyepiece. The camera is focused on infinity and merely held up to the eyepiece. This can be a wonderful way to take pictures of the moon and sun with film or with that new digital camera that you just bought. If you are taking pictures of the sun you **MUST** use a full aperture solar filter or you could ruin your

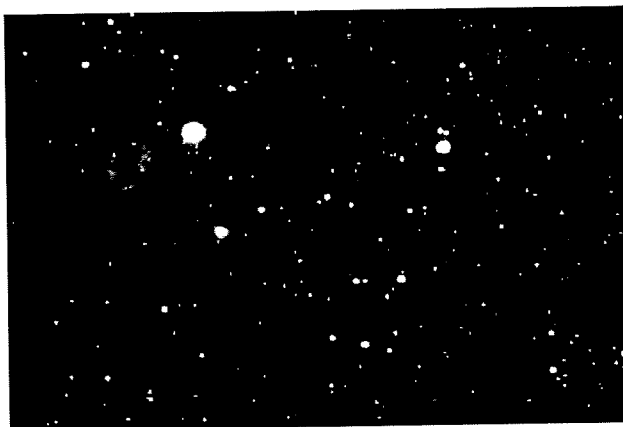
camera, your telescope or YOUR EYES!!!

This method is very easy and is especially applicable to those of you who have a dobsonian mount telescope. The exposures of the moon and sun are short so no tracking is necessary.

If you use film to take photos like this I need to stress the necessity to "bracket" your exposures. This means to try different shutter speeds. Many different shutter speeds will make it easier to find the speed that gives you a nicely exposed photo. Don't be afraid to use up some film here – film is cheap but good astrophotos are priceless!

Prime Focus: Here we go! Prime Focus – use that wacking big telescope of yours for a lens! For "prime focus" photography you remove the camera lens and the telescope eyepiece and mechanically couple the camera body to the telescope. Usually a "T" ring and "T" ring adapter is used to attach the camera to the telescope focuser. The telescope must have a robust equatorial mount and a very accurate drive system to be successful with prime focus astrophotography. How much magnification do you get with a telescope? This depends on the telescope focal length but it is easy to figure out. For a 35mm camera a 50mm lens is considered "normal" or 1X. If you divide the telescope focal length in millimeters by 50mm the result is the magnification. As an example, my 4" refractor has a 600mm focal length. Therefore the magnification at prime focus with a camera is 600mm divided by 50mm or 12 times magnification.





Eyeiece Projection:

Taking prime focus pictures of the planets can be somewhat disappointing. The images that you get are VERY tiny and have poor resolution due to their image scale. To make the image scale larger a special "T" adapter is acquired that allows you to insert an eyepiece into the optical path between the camera and the telescope. This "projects" a larger image onto the film effectively increasing the focal length of the system. There are tradeoffs.... By spreading the available light out over a larger film area the exposure must become much longer and by increasing the system focal length small guiding errors are magnified along with the image. Despite these problems, robust mechanical systems and a lot of practice will allow you to take some very nice planetary photographs. If you are considering prime focus or eyeiece projection photography you have progressed beyond the scope of this article on "simple" astrophotography. Not that prime focus is "hard" mind you but it requires specialized equipment and much practice. The skills that you develop taking camera on tripod and piggyback astrophotos will provide a firm footing for a foray into prime focus and eyeiece projection astrophotography. Good reference material for simple astrophotography is available. I suggest the following books:

"Splendors of the Universe" - Terrence Dickinson and Jack Newton

"Astrophotography for the Amateur - 2nd Edition" - Michael A. Covington

"Widefield Astrophotography" - Robert Reeves

Pointing Accuracy

by Jim Frisbie

Problem: Although I have owned an LX-200 for about 2 years, I have never really been satisfied with the pointing accuracy. I can usually get the desired object to come up in the finder scope but rarely can I get it to show up in the eyepiece. Up to now, I attributed the problem to my lack of experience in astronomy and the complexity of the LX-200 operating system. I have talked with several LX-200 owners in and outside the club, but no-one was really able to offer advice that helped me sort out the problem until recently. A short time ago I was talking with John Kirchoff at Riders Hobby in Livonia about my problem with pointing accuracy. John suggested making sure my dec setting circle was calibrated correctly. If not, during the polar alignment process, the optical axis would tend to wobble as the OTA is rotated, thus upsetting pointing accuracy and polar alignment. He indicated that on a few occasions in the shop, the setting circles on some of his scopes have required re-calibration. His comment set off a number of bells in my head. I have never been able to get my setting circle lock down device loose and consequently never adjusted the calibration. Also, I had recently purchased a Vixen Great Polaris mount and the instruction manual goes into some length concerning the importance of aligning the polar scope so the mechanical axis of rotation and optical axis of rotation are concentric. After thinking over what John said, I came to the conclusion that my GOTO system on the LX-200 didn't have a chance of operating accurately if the mechanical and optical axes were not concentric. Further, since pointing in most scopes is based on mechanical alignment, a lack of concentricity between the mechanical and optical axes can effect the pointing accuracy and polar alignment accuracy of most any telescope using GOTO, digital setting circles or even mechanical setting circles.

Testing: Enough theory, now for the hardware and time to put the theory to the test. Well, I rolled the LX-200 out in the driveway in the daylight and cranked the wedge down until I could see a peak on my house. I loosened the OTA and rotated the OTA until the setting circle read 90 degrees, then disconnected all the leads to the fork assembly so I could freely rotate the forks 360 degrees. Now with the finder scope up, I centered and focused on the peak of my house and proceeded to rotate the fork assembly 180 degrees. WELL GUESS WHAT!, the peak of my house which should have still been centered in my eyepiece was nowhere to be found. In fact, I was staring into the sky somewhere above my house. Well now you say, piece of cake, just adjust the elevation of the OTA to hit the peak, split the difference, loosen the setting circle and re-calibrate and VOLLA! NOT! After 2 ½ hours of trying to find the peak of my house in the eyepiece and determine the difference, which turned out to be only about ½ degree, I came to the sterling conclusion that not only was the OTA alignment off in the declination axis but it was off by 3 or 4 times as much in the Right Ascension axis. This was a major factor in my inability to find the peak of my house while rotating the OTA. The next step was to loosen three allen screws that hold one side of the OTA to the fork arms and adjust the OTA so there was optical and mechanical alignment in the RA axis. It took me another two hours to accomplish that task. And yes, by now it was dark and I had to put a spot light out to have enough light to find the peak of my house. But finally I was able to rotate the OTA and fork assembly 360 degrees and still have the peak of my house in the center of the eyepiece. Now for the real test. Will the LX-200 point accurately in the sky?

Result: I did a polar alignment, centered a second star and now everything is coming up roses! A substantial improvement in pointing accuracy. From coming up in my finder scope within a 2 1/2 degree circle, everything I pointed to now came up in my 26mm eyepiece within a

10 arc minute circle. I calculate my pointing accuracy is now 1500% better.

How would YOU Improve STARR STUFF?

- 1) Are STAR STUFF pictures readable?
- 2) Are pictures helpful?
- 3) Do pictures help your understanding?
- 4) Would you like to see an agenda for the next meeting included in each edition of STAR STUFF?
- 5) Would a calendar of club events be useful?
- 6) Would a calendar of monthly astronomical events be useful?
- 7) Would you participate in a "Road Trip" to UofM's Peach Mountain, EMU's Observatory or MSU's Abrams Planetarium?
- 8) Would you like to see a show and tell of new astronomy products by a local vendor?
- 9) Would you like to know more about your new editor?
- 10) What would you do differently?

Please send responses to any or all of the above questions to Jim Frisbie, w8tu@peoplepc.com

Ford Amateur Astronomy Club

"Halloween" Beginner's Night at Island Lake

Saturday, October 27th, from 7:00PM to Midnight
(Arriving at 7PM will allow you to get help during daylight)

Do you have a new telescope that you would like to learn to use? Do you want to see samples of what the night sky has to offer? (weather permitting)

You should consider coming out to Island Lake Recreation Area on Beginner's Night. These nights are dedicated to providing equipment and observing assistance to new astronomers

(The event will take place on the date indicated regardless of sky conditions, cloudy or clear. If it is raining, the event will be cancelled.)

The exact location of the observing site is the "Spring Mill Pond" parking lot and picnic area, at the Island Lake State Recreation Area, on Kensington Road, south of I-96 between South Lyon and Brighton.

For more info or details on this event, contact John at Pattern120@hotmail.com or Dan at FAAC1992@hotmail.com

The Ford Amateur Astronomy Club observes at the Island Lake site on Friday and Saturday evenings year round, provided skies are clear. You are welcome to visit the observing site on any weekend, but you must be with a club member if you plan to observe after 10PM. Call 1-313-390-5456 to find out if anyone is going out on any particular night.