

Eugene Astronomical Society
Annual Club Dues \$25
President: Sam Pitts - 688-7330
Secretary: Jerry Oltion - 343-4758
Additional Board members:
Jacob Strandlien, Tony Dandurand,
John Loper.

www.eugeneastro.org

EAS is a proud member of:

The Astronomical League
The World's Largest Federation of Amateur Astronomers



Next Meeting: Thursday, April 22nd

Presenting Two New Telescopes for the Club

by Tony Dandurand and Jerry Oltion

Over the winter, Tony Dandurand and Jerry Oltion have been busy on two telescope projects for the club. Tony has been rebuilding the 18" scope we bought from Frank Szczepanski, and Jerry has been building a trackball for the club's scope lending program. Now both scopes are done (or nearly so) and ready to present to the club at our April meeting. Come see what Tony and Jerry have done with these two completely different approaches to telescope design. The trackball will be ready for loaning out, so be ready to armwrestle for first chance at that; provided our telescope lending coordinator doesn't take it home for "further testing" first.

There will also be time for others to bring items for show & tell. If you've got a new scope or piece of equipment you'd like to show off, bring it!

In addition, Jacob Strandlein will present the astronomy news of the month. The meeting is at 7:00 in EWEB's Community Room, 500 E. 4th in Eugene.



The club's 18" scope nears completion

Next First Quarter Friday: April 23rd

Our March First Quarter Friday (March 19th) was the best one so far this year. Tony wrote on our email list afterward: “We arrived late about 8:30, and were lucky to find a parking spot within a block (someone leaving early). By the time our scope was set up, a line had formed that must have been 10 people long at times. My guess is there were over 10 scopes there, and over 100 people viewing.”

Pigg wrote: “We had oodles of kids of all ages, very well behaved and appreciative of what they saw. I must say it was the most delightful Friday Star Party I have been involved with...the crowd was ‘wow...cool!’”

Ken wrote: “I was impressed by the number of the visitors who are ‘night sky savvy.’ Some of them knowing about and commenting on the Trapezium, and in general a good knowledge by many of where the Orion nebula and other object are located.”

This is excellent news. We’re slowly but surely bringing astronomy to the public, which is what star parties are all about. The word is getting around that the Friday nearest the first quarter Moon is a happening night at the College Hill Reservoir. Let’s keep people coming back for more!

First Quarter Fridays are laid-back opportunities to do some observing and promote astronomy at the same time. Mark your calendar and bring your scope to the College Hill Reservoir (24th and Lawrence in Eugene) and share the view with whoever shows up.

Here are the dates for First Quarter Fridays through December of 2010.

April 23	July 16	October 15
May 21	August 13	November 12
June 18	September 17	December 10

March Meeting Report

Our March meeting focused on getting ready for the summer observing season. Sam Pitts began with a demonstration of “The Sky 6,” a planetarium program that also helps amateur astronomers set up photo and observing sessions ahead of time so they don’t waste valuable observing time figuring out what to look at next and how to orient their cameras for optimum exposures.

Tony Dandurand showed off the secondary cage of the club’s 18" scope he’s rebuilding, plus a zoom eyepiece. Jerry Oltion showed off another zoom eyepiece, a low-profile 2-speed focuser, and his favorite chart book (David Levy’s *Skywatching*.) Other members shared various tips and experiences that help them prepare for outings.

Sam brought several boxes of equipment being offered for sale by Dan Halstead, and club members took home many a bargain, including eyepieces, filters, equipment cases, even an artificial star (good for those cloudy nights when you just need to use your scope on something, anything...)

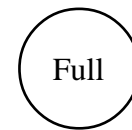
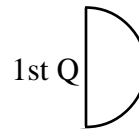
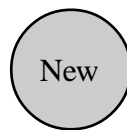
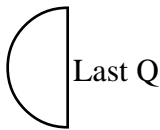
Our next meeting will be on Thursday, April 22nd, at 7:00 PM in the EWEB north building’s Community Room. This is the first room in the semicircular building to the north of the fountain at EWEB’s main campus on the east end of 4th Avenue.

Meeting dates for 2010: (All meetings are at 7:00 in the Community Room)

April 22	July 22	October 28
May 27	August 26	November 24 (Wednesday)
June 24	September 23	December 23



Observing in April



April 6	April 14	April 21	April 28
Mercury Set: 9:31 PM	Mercury Set: 9:33 PM	Mercury Set: 9:02 PM	Mercury Lost in Sun
Venus Set: 9:33 PM	Venus Set: 9:54 PM	Venus Set 10:12 PM	Venus Set: 10:30 PM
Mars Set: 4:18 AM	Mars Set: 3:52 AM	Mars Set: 3:30 AM	Mars Set: 3:09 AM
Jupiter Rise: 5:51 AM	Jupiter Rise: 5:23 AM	Jupiter Rise: 4:59 AM	Jupiter Rise: 4:35 AM
Saturn Set: 6:30 AM	Saturn Set: 5:57 AM	Saturn Set: 5:29 AM	Saturn Set: 5:00 AM
Uranus Rise: 6:09 AM	Uranus Rise: 5:39 AM	Uranus Rise: 5:12 AM	Uranus Rise: 4:45 AM
Neptune Rise: 5:01 AM	Neptune Rise: 4:30 AM	Neptune Rise: 4:03 AM	Neptune Rise: 3:36 AM
Pluto Rise: 1:48 AM	Pluto Rise: 1:16 AM	Pluto Rise: 12:48 AM	Pluto Rise: 12:21 AM

All times: Pacific Standard Time (Nov 1, 2009-March 13, 2010) = UT -8 hours or U.S. Pacific Daylight Time (March 14-November 7, 2010) = UT -7 hours.

Date	Moonrise	Moonset	Sunrise	Sunset	Twilight Begin	Twilight End
4/1/2010	23:30	07:53	06:54	19:40	05:14	21:20
4/2/2010		08:33	06:52	19:41	05:12	21:21
4/3/2010	00:36	09:20	06:50	19:42	05:10	21:23
4/4/2010	01:34	10:14	06:48	19:43	05:07	21:24
4/5/2010	02:22	11:13	06:46	19:44	05:05	21:26
4/6/2010	03:01	12:15	06:45	19:46	05:03	21:28
4/7/2010	03:33	13:18	06:43	19:47	05:01	21:29
4/8/2010	04:00	14:20	06:41	19:48	04:59	21:31
4/9/2010	04:23	15:22	06:39	19:49	04:57	21:32
4/10/2010	04:44	16:24	06:38	19:51	04:55	21:34
4/11/2010	05:04	17:26	06:36	19:52	04:53	21:36
4/12/2010	05:25	18:29	06:34	19:53	04:50	21:37
4/13/2010	05:46	19:34	06:32	19:54	04:48	21:39
4/14/2010	06:10	20:42	06:31	19:55	04:46	21:41
4/15/2010	06:39	21:50	06:29	19:57	04:44	21:42
4/16/2010	07:13	22:58	06:27	19:58	04:42	21:44
4/17/2010	07:56		06:26	19:59	04:40	21:46
4/18/2010	08:49	00:02	06:24	20:00	04:37	21:47
4/19/2010	09:51	01:00	06:22	20:01	04:35	21:49
4/20/2010	11:01	01:48	06:21	20:03	04:33	21:51
4/21/2010	12:16	02:29	06:19	20:04	04:31	21:53
4/22/2010	13:32	03:02	06:17	20:05	04:29	21:54
4/23/2010	14:48	03:31	06:16	20:06	04:27	21:56
4/24/2010	16:04	03:57	06:14	20:07	04:24	21:58
4/25/2010	17:20	04:22	06:13	20:09	04:22	22:00
4/26/2010	18:36	04:48	06:11	20:10	04:20	22:02
4/27/2010	19:52	05:16	06:10	20:11	04:18	22:03
4/28/2010	21:07	05:48	06:08	20:12	04:16	22:05
4/29/2010	22:17	06:25	06:07	20:13	04:14	22:07
4/30/2010	23:19	07:10	06:05	20:15	04:12	22:09

Items of Interest This Month

Venus and Mercury visible in evening during first two weeks of April

4/1 Comet LINEAR B impacts Mare Imbrium

4/3 Moon within 1° of Antares in early AM

4/13-20 Mars and Beehive Cluster within 2°

4/16 Moon near Venus and Mercury

4/22 Moon within 5° of Mars

4/23-25 Venus within 5° of Pleiades

4/23 First Quarter Friday Star Party

4/25 Moon passes 8° south of Saturn



For Current Occultation Information

Visit Derek C. Breit's web site

"BREIT IDEAS Observatory"

<http://www.poyntsource.com/New/Regions/EAS.htm>

Go to Regional Events and click on the Eugene, Oregon section. This will take you to a current list of Lunar & asteroid events for the Eugene area. Breit continues to update and add to his site weekly if not daily. This is a site to place in your favorites list and visit often.

All times are for Eugene, Oregon, Latitude 44° 3' Longitude 123° 06' for listed date

Direct and Averted Vision among the Hickson Groups

by Jim Jackson

The Hickson compact galaxy groups atlas published in 1994 consisted of 100 relatively discrete groups of 4-7 galaxies studied by Paul Hickson, a Canadian astronomer. The atlas makes for a nice observing target list for larger aperture scopes, and I have seen 31 groups the past several years.

So this past weekend, I spent a bit of time reviewing the logs and decided to take a closer look at the direct and averted vision data in comparison to the published magnitudes and surface brightness of the galaxies to see how the 18", and more importantly how I performed.

Although this data is specific to the 18", the general lessons learned should be applicable to all sizes of scopes. Just scale the results up or down for your scope.

First, a few definitions and comments might be in order.

Magnitude of a galaxy is how bright it is if it was a point, like a star. Surface brightness of a Galaxy is its brightness/arc-minute squared. Large galaxies can appear much dimmer than the listed visual magnitude, because the light is spread out over a large area. Conversely, a small galaxy (< arc-minute squared) can appear brighter than the listed visual magnitude. Also note that the visual magnitude is often .5-1.0 magnitude brighter than the published "blue" magnitude.

Most of the galaxies in the Hickson groups are visual magnitude 13-15 on up, so do require fairly large aperture. As a comparison, my 11" scope will give solid views of galaxies up to about 13.1 magnitude. Since the 18" should provide about 1.1 more magnitude, a 14.2 magnitude galaxy should be reachable.

I use a direct and averted vision scale that in a nutshell goes like this:

Direct-direct vision. Rod recruitment is not needed. :-)

AV1- initially picked up averted vision, but can at times pick up Direct

AV2- always averted vision, but always there.

AV3- averted vision seen >50% of the time

AV4- averted vision seen < 50% of the time

AV5- averted vision picked up < 20% of the time after studying the field for several minutes.

So what did I see, and when did I see it?

I charted the visual magnitude on one axis, the galaxies surface brightness on the other axis, and noted if the observation was Direct/AV1/AV2/AV3/AV4/AV5. It was clear reviewing the chart data that the Direct, AV1 and AV2 observations tended to clump together, while the AV3, AV4, and AV5 chart data likewise overlapped.

So what conclusions could be drawn?

1) Direct, AV1, and AV2 observations favor "brighter" visual magnitude (13.3-14.3). No surprise there!

2) Direct, AV1, and AV2 observations can happen with lower surface brightness galaxies (13.6-14.3) IF visual magnitude is brighter (13.3-13.8).



Jim's scope awaits a look at the Hickson Groups

3) AV3, AV4, AV5 observations were clustered around the dimmer (14.3-15.0) visual magnitude galaxies.

4) AV3, AV4, AV5 observations CAN pick up "dim" galaxies (14.7-15.0) IF the surface brightness is "bright" (12.4-13.2). Since these galaxies are small, higher magnification will recruit more rods on the retinal surface and bring them out. I often had to increase magnification from 188X to 295X to spot these galaxies.

5) AV2 observations rarely went past 14.2 visual magnitude. Since AV2 is a marker for a "solid" observation, the 18" — and also myself — performed as we had hoped!

6) Most galaxies in the Magnitude 13 range were Direct or AV1 observations. However low surface brightness (14.2+) galaxies gave AV3 & AV4 observations.

7) Observations made when galaxies were close to the horizon — and lots more atmosphere to look through — presented a much "dimmer" picture than objectively what one would expect. For instance IC 5357 in Hickson 97 observed low in the eastern sky with a visual mag of 12.9 and a surface brightness of 12.0 was only an AV2 observation!

Overall I was pleased with the analytical results. No big surprises, but it does put a quantitative tag on the 18" performance. And some reinforcing lessons that while overall magnitude is important, equally important is the galaxy surface brightness.

More on the Hicksons: <http://www.deep-sky.co.uk/observing/galaxies/hickson.htm>

More on AV scale: <http://www.astronomylogs.com/resource/pdf/13%20Averted%20Vision%20Scale.pdf>

Pine Mountain Observatory Plans for Summer 2010 Season

From Mark Dunaway, Facilities Manager at PMO:

We have started booking schools and the scheduled numbers are slowly climbing. See the calendar at meetup.com for the latest information: <http://astronomy.meetup.com/116/>

All PMO tours and events are put on the calendar. We could take tours as early as May 7th. No tours before that date. Full moon in May is around the 1st so if clear the following weekend would be the earliest. Right now the earliest tours are Thursday May 13th. See the calendar.

Private tours are \$125 for the first 20 and \$5 per person over the first 20.

Groups joining weekend tours during the Memorial Day through the end of September (our regular summer public season) MUST schedule with us in advance so we can anticipate larger crowds on the dates of their visit.

Please stress the \$5 per person to groups that come on weekends as we will try to add staff which raises the fuel costs.

We are still paying 25 cents per mile for trained volunteers. Volunteers coming from the valley must commit to 2 nights and be trained to get the fuel allotment.

If there is a question volunteers need to contact me and I will make the call. Carpooling is encouraged, especially from further areas. We're looking for new recruits and we welcome back veteran tourguides. Please contact Mark Dunaway [markpmo@oregon.uoregon.edu], or Kent Fairfield [tualatinkent@aol.com], for more info, or enroll at the [meetup](http://meetup.com) website listed above.

Thanks. See you on the mountain this summer!

Free Science Factory Planetarium Demo for Teachers and EAS Members

TOUR YOUR RENEWED PLANETARIUM at the Science Factory on Leo Harris Parkway near Autzen Stadium, Eugene.

Two identical programs: 3:00-4:00 PM and 4:30-5:30 PM

Wednesday, April 28th, 2010

FREE for Lane County teachers — for ALL teachers, cross-curriculum programs for ALL grade levels, K-University, variety of programs

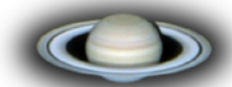
See the updated and upgraded system with digital projection technology update, a major visual upgrade to lighting and 3D effects.

- *Mini demo lesson about motion of Planets and Stars
- *Project to take back to your classroom
- *Information about visiting Pine Mountain Observatory
- *Information about visits to your classroom
- *Information about local sky viewing with EAS
- *Refreshments provided by Lane ESD (PDUs too!)

Organized by Sue Peterson, Planetarium Director and Rick Kang, Education/Public Outreach Coordinator, Oregon Astrophysics Outreach/Pine Mtn. Observatory

Questions? Contact Rick [rkang@efn.org] 541-683-1381, or Sue [Sue.Peterson@sciencefactory.org] 541-682-7888

EAS members, if you're a teacher or know some teachers, please pass along the word! Thanks!



Scope Library Notes

The weather has made good observing conditions pretty scarce lately. But amazingly, new and veteran members had six of eight telescopes checked out of our lending library during the month of March.

The “Little Ten” was just returned, and is now again available for lending to members. Check out a new scope for Spring.



The “Little Ten”

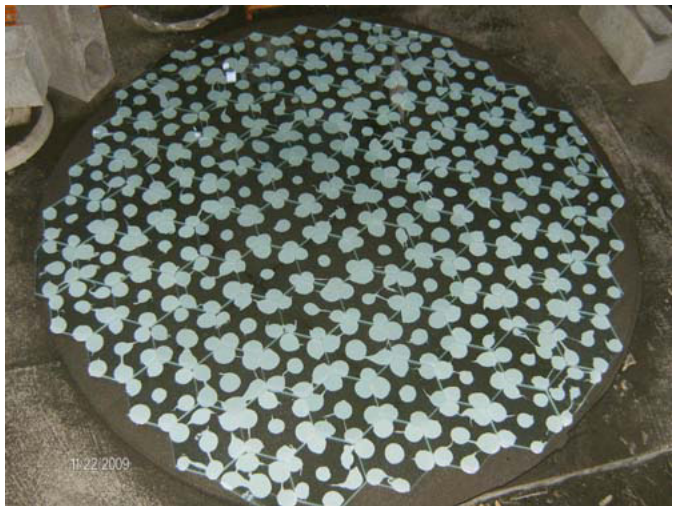
How Big is Too Big?

by David Davis

A couple of years ago I joined up with a group called the Alt-Az Initiative. The members are researching amateur-built 1- to 3-meter telescopes. The goal is to break the upper limit of the homemade scope tradition and entice some brave souls to try larger aperture telescopes. At least that is what I signed on to. In the ensuing 16 months the initiative has also embraced radical mirror design, radical scope design, scope automation and the various bits of science that can be done with such a scope. I've had the opportunity to hear talks by professionals in the field of astronomical science as well as some amazing presentations by amateurs from all over the world. You can read more about the initiative at <http://www.altazinitiative.org/>

I was approached because they were looking for someone crazy enough to play with big glass, (they call them small telescopes), and push some of the ideas into reality. I have done some thin glass mirrors and was looking for ideas on thin glass support. I was paired up with an engineer out of Florida named Andrew Aurigema. Andrew's forté is material and he was already looking at some resin and fiber ideas to support thin glass mirrors when we were introduced. Over the year of 2009 we tested and abandoned several support designs, but ultimately began a second generation of tests using glass foam. There are two sources for the foam. One is Pittsburgh Corning which makes a product called FoamGlass. It is used as an industrial insulation. The second source is a company named EarthStone. They make a foam with a bit more lime and ceramics in it for use in a number of industries including hydroponics and surface preparation.

What we did was to shape the foam by milling it. We used a number of different techniques to form curves including basic mirror grinding techniques, pendulum routers and CNC mills. We used the milled foam to heat form thin glass plate into a meniscus lens that could be finished with common grinding techniques. We tested fusing the glass to the foam and using the foam as a top element in a complex cell design. We also explored tessellated mirrors formed from multiple hexagonal elements. We have successfully finished out five mirrors. Two fused meniscus mirrors, one glued meniscus mirror and two glued tessellated mirrors. The adhesives used



Hexagonal mirror elements glued to foam backing

were various "rubber" type adhesives like silicone and polyester caulks.

As of January 2010 Andrew began to tool up to do further work on single meniscus mirrors with a foam backer. I began to work on tessellated mirrors. I chose the tessellated route as the materials are easier to obtain and work and the techniques needed are common mirror grinding techniques. That and the blank size is only limited by your fears. I am currently working on a 1.5 meter blank. It is made of 6 inch tessellation harvested from table tops bought at garage sales. My idea is the foam is just a component



The 1.5-meter mirror after rough grinding

of the mirror cell and the glass should be able to stand on its own as a mirror. The glass is $\frac{3}{8}$ inches thick. The foam also forms a grinding block so that all of the mirrors are done at once and have a common finished focal length. The sagitta ground into each six inch blank is about $\frac{1}{64}$ th of an inch. So what I am doing is grinding 85 six inch mirrors with a focal length of 180 inches. Once the grind is done the mirrors could be removed from the block and mounted on an active wiffle tree or left on the block and the block used as a monolithic cell. I am going to do the latter as it means the mirror group will only need collimation to use.

I have played with a number of grinding ideas and have video of some of them on YouTube. My earlier videos lack editing and my newer ones lack theme but they do show what I have done. At least some of what I have done. I'd like to challenge the mirror makers at EAS to try a tessellated mirror. The materials are available locally. You can get the foam through E J Bartells out on 6th at Hwy 99. Small tessellation can be cut with a glass cutter or if you know someone with a water jet machine they can cut thicker glass very quickly. I used polyester caulk to glue the tessellation down to the foam. A blank 24 inches across will cost you around \$100 and substantially less if you are willing to scrounge a bit.



A 21-inch grinding tool



Spin grinding with a 36-inch ring tool

As usual amateurs are leading the way and you can be part of that parade. The alt-az initiative is open for your membership. The technology is grass roots and common materials. Come and join me on the bleeding edge. How big is too big?



The stack at a distant paper mill. Afocal hand-held shot using an uncoated spherical tessellated mirror.

Watch videos of this project at:

<http://www.youtube.com/watch?v=vZIVRkivdIU>

<http://www.youtube.com/watch?v=eZhXPqIRgUI>

<http://www.youtube.com/watch?v=9tofUCfTA7k>