

IO – January 2004

www.eugeneastro.org

Eugene Astronomical Society, Annual Club Dues \$25, President: Jean Grendler, School Star Party Coordinator , 683-9382, moegren@msn.com
Vice-President & Treasurer: Sue Moe , suemoe@worldnet.att.net, Telescope lending program: Rossco . Web Master Dave, Nexstar11.com ;
IO editor, Sam Pitts, sampitts@aol.com :Io (*EYE-oh*) is nearest to Jupiter and fastest orbiting of the four Galilean moons

HAPPY NEW YEARS

January 5, 2004 MEETING EUGENE ASTRONOMICAL SOCIETY North Eugene High School Room #319 at 7:00 PM

The January 5th EAS membership meeting will feature EAS Board Member and Treasurer, Sue Moe giving her presentation on her variable star research. Sue was the recipient of a two year Murdock Trust Partners in Science grant and has been doing her research at the James Karl Observatory on the Lewis and Clark College campus. Sue will present her findings at a national Murdock Trust Partners in Science Conference in San Diego in February. A short video produced by the American Association of Variable Star Observers will also be shown. Missions to Mars and observing Saturn will be on members minds and we have gained access to three historical documentary slide presentations featuring missions to these planets. A selection will be shown at the meeting. Two new EAS Board members are to be selected.

NASA Night Sky Network

Eugene Astronomical Society is now an official charter member of the NASA Night Sky Network! This came about because EAS was/is participating as a BETA tester for outreach kits designed by ASP/JPL. Jean has been testing the kits and using the material as much as possible and reporting back to the network.

Starting next Tuesday, ASP will be sending out press releases and emails to amateur astronomy clubs nationwide to accept applications.

New clubs will start being selected in February. The new version of the Outreach Tool Kit will go out the beginning of March. And, of course, you'll get one!

The LIVE Night Sky Network is
<http://nightsky.jpl.nasa.gov/>

I will be checking the web-site soon to make sure that our info is up to date and that everything is appropriately logged in.

Previously, I have invited other members to become involved in outreach, and I will continue to do so. EAS will get some national exposure for the work that was done in the name of the club.

Jean Grendler, president EAS

New Imaging Group

A new Special Interest Group (SIG) is forming to discuss and enjoy Astro-Imaging. Sam Pitts & Dave Cole are spearheading the group. The focus of the group will be Astrophotography, CCD and other forms of imaging the night sky. Many have shown interest in this area of Astronomy so a group has formed.

The group hopes to be directly affiliated with the Eugene Astronomical Society when the Board reviews its application to be a SIG group of EAS.

Thanks Dotsons

Jim Dotson of Dot Dotson's surprised me this week with a donation of a #531 Meade Motor Drive (new, still in box) that I hope will be usable on the Club's 4.5 Meade scope. Jim Dotson also donated a nice Alt/Az tripod for a scope that we might be able to use to make one of small refractors into an easy "moon" scope for Rossco's learner scope farm.

I gave him the appropriate receipt. I will get these items to Rossco so he can check them into EAS's Club Scope inventory.

Join the user List! Keep in-touch with Members and Events!

<http://lists.cmc.net/cgi-bin/mailman/listinfo/eugeneastro>

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Spring is Coming

Messier Planning Time

I know it is still raining out and I haven't been able to setup my equipment for three months. Now that Christmas has come and gone some new telescopes have probably been delivered with other neat astronomy equipment. This will add to the many overcast and rainy nights ahead.

Now is the time to start planning those early Spring outings. March presents a window of opportunity in Oregon where we can actually see all of the 110 Messier objects. Yes 110, as I am from the school that M 102 is actually NGC5866, a nice small Galaxy in Draco and not a miss sighting of M101.

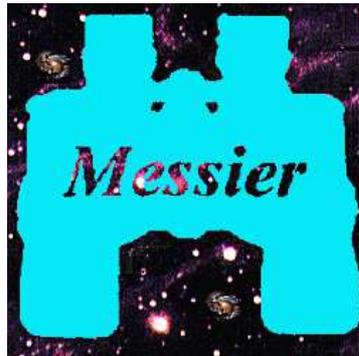
I would like to encourage everyone to participate in the many Messier certificate programs offered by:



Astronomical League Binocular Messier Certificate

Binocular Messier Club Chair:

Mike Benson
2308 Dundee Lane
Nashville, TN 37214-1520
(615) 883-6571
E-mail: ocentaurus@aol.com



Observe 50 or more Messier objects using only binoculars.

Astronomical League Messier Club Certificate

Messier Club Chair:

ScottKranz
106 N Darrowby Drive
Raymore, MO 64083-9181
(816) 331-5796
E-mail: s.kranz1@comcast.net



Observe 70 Messier objects and keep a record of your observations For Regular Certificate.

Observe all 110 Messier objects & receive an Honorary Certificate.

Try and earn one of these certificates, as some EAS members have done. You will spend hours locating & viewing some great deep sky objects. Since you can only use star charts and star hoping techniques, no GoTo scopes, setting circles, etc, you will learn to navigate the night skies. I found it best to preplan a nights outing by viewing sky charts or printing them out from a computerized Star Atlas. The preparation is also a learning experience. Now with the Binocular messier Certificate you can get started right away, whenever there is a break in the weather.

Sam

EAS President looks back at 2003

By: Jean Grendler, EAS President

The year 2003 was monumental for Eugene Astronomical Society. Membership has grown tremendously. EAS became a corporation. We wrote and passed our bylaws. Record numbers has attended our star parties and events! EAS events have been in the news regularly including a feature story in the Oregon Life section of the Register Guard. Our big Mars events got us on all three local TV stations. Collaborations and partnerships have been forged that will continue to benefit EAS for years to come! EAS fundraising efforts have put our treasury in good shape and benefited our partner organizations. EAS has more assets than ever, including our flagship Rob Adams Telescope. EAS meeting programs have been well received this year and our own members have stepped up to share their expertise with us. EAS outreach into schools included solar viewing, star parties and classroom talks. We had a very busy year with community outreach including our now famous Mars viewing, star parties and community programs. Astronomy Day 2003 brought right at a thousand guests. Personally, I look back with pride at the work I have done for EAS in 2003.

In January I attended meetings with staff from The Science Factory and The International Mars Society. The results of these meetings were that EAS would sponsor a two-day event at The Science Factory called "Seeing the Stars" and EAS would host a huge star party for the upcoming Mars Society Convention to be held at the Eugene Hilton. I would also play a role in planning meetings for the event as a whole, including suggesting the astronaut who was the keynote speaker.

February brought news that I would accept possession of the Rob Adams Telescope for EAS. On Saturday, February 22nd, EAS member volunteers met at the planetarium, which was defunct at the time, and loaded the scope into a trailer that Sam furnished. We had quite a procession through Eugene to bring the scope to its first EAS home! February brought another meeting with The Science Factory staff, a meeting with Mars Society members at the Eugene Hilton, and an EAS Star Public Party at College Hill Reservoir. Work began on EAS' Astronomy Day 2003 with planning meetings with EAS volunteers and student volunteers. A meeting with Larry Deckman of Starfinders, Inc. also benefited EAS' Astronomy Day function! I made many contacts to secure literature and free handouts and door prizes. I made connections with the Space Science Telescope Institute that gave EAS an opportunity to be one of the two dozen amateur astronomy clubs across the U.S. to unveil a never before made public Hubble Image on Astronomy Day. In February I attended Larry Deckman's Astronomy presentation for the University of Oregon Law Conference. Since Larry was loaning me (EAS) his slides to present on Astronomy Day, this was my "training" session. A planned Star Party at College Hill had to be cancelled; we had the first meeting of the Rob Adams Telescope Committee (I was elected the chairperson) and had another planning meeting for Astronomy Day. I got Dot Dotson's to agree to sponsor a photography contest and provide the prizes for the contest for EAS' Astronomy Day and designed posters with the Dotson's folks in February. I picked up the beautiful, photo-posters up at the end of February for distribution. Many hours were spent writing press releases and PSA's for Astronomy Day and coordinating efforts with the crew chiefs and committee chairs that were working hard to make each part of Astronomy Day a success!

April brought "incorporation" meetings and lots of work. April also brought four rainouts for planned EAS events, meetings at the Lane ESD to work out cosponsorship agreements for Astronomy Day and training on the StarLab portable planetarium that the ESD agreed to loan to EAS for Astronomy Day! What a relief it was, too, to have that planetarium available, given all the rain that was coming down! On the 23rd, Sue Moe and I left for Tucson for a meeting of the American Association of Variable Star Observers. We networked with amateur and professional astronomers from around the country, learning what we could to bring back and build better programs and planting the seeds for more collaborative efforts down the road. I designed and printed posters for Astronomy Day and began distribution.

May brought a break in the weather and we had a clear sky for Astronomy Day. I had so many requests for interviews that I didn't have time to be nervous! All the final deliveries of flyers and picking up of printing and prizes came to an end on Friday, the 9th and EAS volunteers came together to set up and decorate for an outstanding event! Many thanks for all the hours everyone put in! Astronomy Day keeps EAS in the spotlight of the media and gives club members the opportunity to share and promote astronomy in a great community setting. There wasn't much time to rest after the big day. The 15th brought a total lunar eclipse and that meant another event to plan and PR to do! The sky cleared for a good look and the crowd was audible and awed! I did outreach for EAS at two schools in May, also. Three other EAS related meetings and a request for an interview for the AAVSO completed the month. June brought the final school star party before summer break. I was asked to bring scopes to the Juneteenth Celebration again this year and some of the club members generously brought their equipment and made a good show of it for EAS. We had Mayor Torrey looking at the sun at this event! Another public event was planned for the Solstice with College Hill Reservoir again being a great location. The club social was scheduled for this month and A.C. located a great spot: Elijah Bristow State Park. The potluck was great and the viewing was nice! We had music from club members, too! I can't wait to do it again!

July brought more board work and planning and coordination work for events at the Fern Ridge Library and Mt. Pisgah Arboretum. EAS had a star party at College Hill Reservoir on the 18th and A.C., Alicia and I began the work of getting the Eugene Celebration Float going by attending a Float Workshop on Saturday, the 19th at the EWEB conference room. More work was done on for incorporation. A meeting at the Science Factory to discuss collaborations finished up the club work for July.

EAS President looks back at 2003

Continued from Page 3

August brought a meeting with Ted to do corporation stuff, the event at Fern Ridge Library that I appreciate members handling so well, an advisory meeting at Ted's office, a star party for Campfire Kids and four days of Mars Society Convention. EAS had a table and presence at the entire event. Alicia, Leticia, Barb, Sue and Larry helped with the information table. I had my scope there for solar viewing for three days and Randy and Tracy came down with their scopes on Saturday. Alicia and I had the pleasure of having Dr. John Grunsfeld (astronaut) and other NASA/JPL and Mars Society folks out for solar viewing at my scope. EAS held a huge star party on Saturday night in conjunction with the Mars Society Convention. Lots of work went into getting permission to use the Parkade for this event. Again, we had about a thousand guests. There was a parade workshop to go to at Rossco's, another meeting at The Science Factory and a public Star Party/Mars Gaze on College Hill Reservoir on the 22nd, with EAS playing host to a thousand people wanting to see the planet Mars as it neared its closest approach in thousand of years. Media requests for appearances and interviews were heavy in August I decided to seize the opportunity to do another big function (and make it a fundraiser) on THE date of Mars' closest approach. I coordinated with North Eugene High School and Sue helped get the teachers there to staff donation tables for a joint fundraiser. Club members stepped up and brought about twenty scopes out onto the field for this viewing. We had another record-breaking crowd and made almost \$5,000 to split between the school science department and the club. A.C., Sue and I were pretty exhausted from all the interviews and showing up at 5:30 AM for a couple of days to do live shows and "look live" shows for all the TV stations. I met one TV crew down at the courthouse to do a spot for them! I lost track of all the radio interviews that I did for this event. I can say that Eugene Astronomical Society did one heck of a lot of public outreach in August of 2003. With the convention and the events my conservative estimate is that we outreached 6,000 people. WOW!

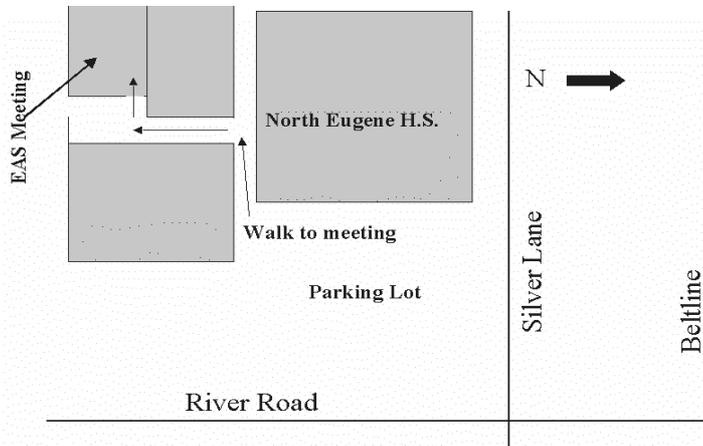
Did September bring a bit of rest? No, it's time for school to start and the Eugene Celebration Parade! I have five EAS related meetings and three school outreach sessions. EAS has a big "Back to School" star party and event at College Hill on the 12th. I have spent many hours via email and phone collection materials for the teachers I have invited to take back to their classrooms. Many good contacts are made at this event. The Lane ESD had partnered with EAS by sending posters I have designed and printed to all of the schools in Lane County. Several hours of phone work go into follow-ups on requests for more info or school star parties. The Eugene Celebration Parade is on the 20th and the EAS Mt. Pisgah Star Party and Fundraiser is on the 27th. We had great attendance from the public and good donations. EAS has great members who are very generous with their time and show up bearing telescopes, laptops or slide projectors for our events. Oh, yeah, the green laser pointers are fun and a great hit with the crowds, too!!

In October there are more Board meetings and events to do PR and planning for. October 4th brings EAS' "Good Bye Mars" event at The Science Factory/Planetarium. Some of the EAS members, myself included, get to see our photography/images on the dome of the planetarium! Great cooperative efforts! As I recall, the weather outside was bad, but the crowd inside had a good time. Sue's Mars Rover was a hit and lots of folks held a piece of another world in their hand. Members' scopes on display and Sam's laptop presentation were popular. Another Starlab training to attend and teachers to meet at the ESD office this month. Now, I am "certified" for the Starlab portable planetarium that is owned by the ESD. EAS holds the Adam's School Star Party and I outreach three second grade classrooms this month. A small group star party that was scheduled had to be cancelled due to weather and the first meeting of EAS mirror grinders happens at North Eugene High School. A.C.'s St. Paul School star party completes the month.

November's weather is bad and family matters consumed much of my time. Many thanks to those who stepped in to help. I had scheduled an EAS event for the total lunar eclipse on Saturday the 8th. The weather did not cooperate, no moon to be seen. The EAS Warm Springs event that had been in planning stages for some time was put off until perhaps the spring and the scheduled star party at Saginaw School was called due to rain. But, the EAS mirror grinders did meet again to make more plans for their work! December brought the EAS Winter Social and Dessert potluck. Members had good swap and sale tables, too. The EAS Advisory Committee, which I got elected to chair, will continue on, meeting every other month for a while. Hopefully, we will add two more board members in January, and be able to take on some more work!! Yikes!

Seriously, there are many things in the works to make EAS even better. None of the great things that happened in 2003 could have been done without member support. Yes, there is a lot of work that goes on behind the scenes for every event and every meeting that EAS has. I chair the Rob Adams Telescope Committee and am the EAS Star Party Coordinator, do the club PR and head up Education and Outreach and plan the club meetings. For two years I have coordinated Astronomy Day. At times in 2003, the club work has been a 40-hour a week job! I have networked with many people on behalf of EAS. I was asked to participate in a survey for the Structure and Evolution of the Universe project being conducted by the Astronomical Society of the Pacific for NASA's SEU Forum that is operated by the Harvard-Smithsonian Center for Astrophysics. Next, Jenny Tieu who leads the Girls in Science program for JPL's Navigator Public Engagement project asked me to complete a survey for her project. She wants to involve amateur astronomers from the Night Sky Network (through my work in beta testing the Planet Quest materials EAS became a charter member of the Network) in the delivery process of a program that focuses on the telescope and its applications for Girl Scouts. At the AAVSO meeting I have discussed directly with the executive director, Janet Mattei, the possibility of EAS collaborating with AAVSO on a west coast teacher training event. I have worked closely with our own Planetarium director and children's science museum director to ensure that EAS has a good working relationship with those entities. Likewise I have with the science coordinator for our local education service district and members of the business community. I have been able to devote this kind of time to EAS because I was retired and I love doing it! Thanks for your support and for giving me the opportunity to take the helm and lead Eugene Astronomical Society. I look forward to the work ahead in 2004!

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EAS Meetings 1st Monday of the Month
 7:00-9:00 PM

NW Astronomy Email List Provides Forum for Discussion

The List keeps growing! Join the fun and discuss **Astronomical Topics** with others! Keep informed to local astronomical events and happenings. Use the list to ask questions about equipment or anything regarding Astronomy. The NW Astronomy list is open to anyone to join. Dave Cole, the EAS Webmaster, moderates this list. To join, visit the EAS web site or Dave's Web site: Nexstar11.com

Exposure Table Deep Sky (IN MINUETS)

	100	200	400	800	1000	1600	3200
F/2.8	40-48	12-24	8-12	5-6	3-5	2-4	1-2
F/4	80-96	40-48	20-24	10-12	6-10	4-8	2-4
F/5.6		80-96	40-48	20-24	12-20	8-16	4-8
F/8			80-96	40-48	24-40	16-32	8-16
F/11				80-96	48-80	32-64	16-32
F/16					96-160	128+	32-64
F/22							64-128

Exposure Table Quarter Moon (IN SECONDS)

	100	200	400	800	1000	1600	3200
F/2.8	1/250	1/500	1/1000	1/2000	1/2000		
F/4	1/125	1/250	1/500	1/1000	1/1000	1/2000	
F/5.6	1/125	1/125	1/250	1/500	1/500	1/1000	1/2000
F/8	1/60	1/60	1/125	1/250	1/250	1/500	1/1000
F/11	1/15	1/30	1/60	1/125	1/125	1/250	1/500
F/16	1/8	1/15	1/30	1/60	1/60	1/125	1/250
F/22		1/8	1/15	1/30	1/30	1/60	1/125
F/32		1/4	1/8	1/15	1/30	1/30	1/60
F/45			1/4	1/8	1/15	1/15	1/30
F/64					1/8	1/8	1/15

Sky Glow and Sky Darkness will effect exposure rates.
 These exposures are for 45° -90° above the Horizon

So Little Time, So Many Galaxies

By Dr. Tony Phillips

Fourteen billion years ago, just after the Big Bang, the universe was an expanding fireball, white hot and nearly uniform. All of space was filled with elementary particles and radiation. "Soupy" is how some cosmologists describe it.

Today the universe is completely different. It's still expanding-even accelerating-but there the resemblance ends. The universe we live in now is "lumpy." Great cold voids are sprinkled with glowing galaxies. In galaxies, there are stars. Around stars, there are planets. On one planet, at least, there is life.

How we got from there to here is a mystery. Finding out is the goal the Galaxy Evolution Explorer, "GALEX" for short, a small NASA spacecraft launched into Earth orbit April 28, 2003. GALEX carries an ultraviolet (UV) telescope for studying galaxies as far away as 10 billion light-years.

"GALEX is a time machine," says astronomer Peter Friedman of Caltech. Because light takes time to travel from place to place, pictures of distant galaxies reveal them as they were in the past. "GALEX is investigating the evolution of galaxies over 80% of the history of our universe."

The Hubble Space Telescope can see faraway galaxies, too, but GALEX has an advantage: While Hubble looks in great detail at very small regions of

the sky, GALEX is surveying the entire sky, cataloging millions of galaxies during its 2-year mission.

GALEX is a UV mission for a reason. Friedman explains: "UV radiation is a telltale sign of star birth." Stars are born when knots of gas condense in interstellar clouds. The ones we see best are the big ones-massive stars that burn hot and emit lots of UV radiation. "These stars are short-lived, so they trace recent star formation."

Understanding star formation is crucial to studies of galaxy evolution. When galaxies collide, star formation surges. When galaxies run out of interstellar gas, star formation wanes. In galaxies like the Milky Way, spiral arms are outlined by star-forming clouds. The shapes of galaxies, their history and fate – they're all connected by star formation.

Even life hinges on star formation, because stars make heavy elements for planets and organic molecules.

"Our measurements of UV radiation will tell us both the rate at which stars are forming in galaxies and the distances of the galaxies," says Friedman.

How did we get here? GALEX will show the way. Find out more about GALEX at www.galex.caltech.edu. For children, visit The Space Place at spaceplace.nasa.gov/galex_make1.htm and make a beautiful galactic mobile while learning about some of the different shapes galaxies can take.



This image of Messier 101 (M101), aka the "Pinwheel Galaxy," was taken in two orbits of GALEX on June 20, 2003. M101 is 20 million light years away.

The Size of the Universe

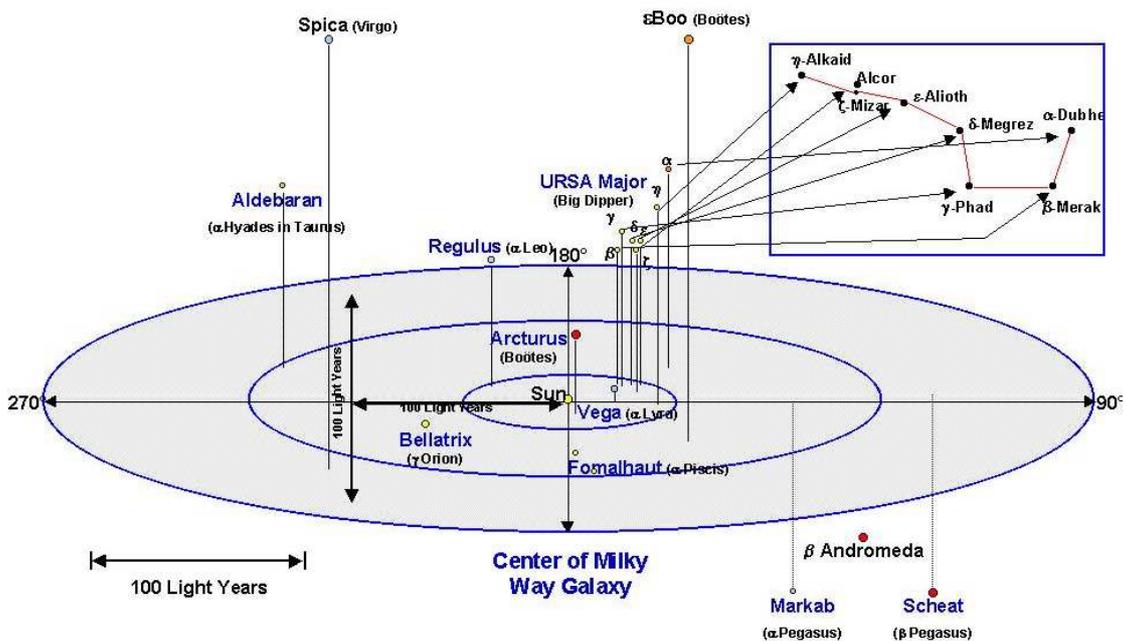


Imagine the Earth is the size of a Quarter, the Sun would be a 9 foot ball 1,000 feet away



Now Imagine that our whole Solar System is the size of a Quarter. You would need a microscope to see the Sun. The closest Star "Proxima Centauri" would be 300 feet away. Our Milky Way Galaxy would be 1,300 miles across!

Just think, if our Milky Way Galaxy were the size of a Quarter. The Solar System would be the size of a Molecule. Now imagine millions of dimes, quarters & half dollars, each representing a Galaxy with millions of stars. They would be floating in space in all directions, from 1 foot to over a 1,000 feet away



The Milky Way Galaxy

Our Neighbors on the Next Block

Field of View

Sam Pitts 4/2001

What is my Field of View

This depends on your eyepiece's magnification and apparent field of view, along with the telescope being used. The eyepiece has a focal length, indicated in millimeters. The longer the focal length of an eyepiece, (25mm-50mm) the lower the power (magnification) and the wider the field of view. This assumes we are using the same telescope. The higher the magnification, the shorter the focal lengths, thus a smaller field of view (FOV).

To determine the magnification of an eyepiece, divide its focal length into the focal length of the telescope's objective Lens/Mirror. (8"=200mm X 10 (f/10)=2000mm)

Telescope: 8" f/10 = 2000mm focal length
Plössl Eyepiece 32mm & 50° FOV
Magnification $32\text{mm} \div 2000\text{mm} = 62.5\text{x}$

The field of view with this setup is determined by eyepiece's magnification & apparent field of view (50°). Hold an eyepiece and look through it. The circular view of light observed is it's apparent field of view. The diameter of this circle is the apparent field of view measured in degrees. Below is a list of apparent field of views with different types of eyepieces.

Nagler 82°
Meade Ultra Wide 84°
Super Wide 67°
Erfle 60°
Plössl 50°
Orthoscopic 45°
Kellner 40°

Find the Field of View

To find the actual field of view, divide the apparent field of view of the eyepiece by the eyepieces magnification on a particular scope. Using the example above:

$$50^\circ \div 62.5 = 0.8^\circ$$

The 32mm Plössl on an 8" f/10 (2000mm) telescope will render a true field of view of 48 Arch Minutes or 8/10 of a degree. Remember the moon is approximately a 1/2° in width. Wide field of view lenses may suffer from aberration near the edges due to astigmatism. The stars may be distorted near the edge of the field of view.

A 32mm Nagler 82°, with the same telescope, would have a FOV of 1.312° or 1° 18' 43.2"
A 32mm Kellner 40°, with the same telescope, would have a FOV of .64° or 38' 24"

Eyepieces > 32mm are best used with 10" or larger objectives and 2" diagonal.