

The High Desert Observer

The Bulletin of the Astronomical Society of Las Cruces

April, 2009

President's Message



April kicked off with a huge public outreach event. 100 hours of astronomy was an event of world wide proportion. Kirby and Wes coordinated the local outreach event. We had solar scopes set up around town during the day and several locations with telescopes for the evening viewing. Dave Dockery, Rich Richins, Steve Shaffer, and Shawn Rickman kicked off the event with their participation in the NMSU Open House at the Clyde Tombaugh scope housed in our dome at NMSU. They cleaned it up and got it setup and running. They put it on Saturn and had a line all night long. It's great to see that important part of the club's history being put to good use. On Saturday we had Wes and Carol Baker, Kirby, Bill Stein, George Hatfield, Nils Allen, Rich Richins and Steve Smith participating in the day and evening events. Thanks to all that contributed their time.

March ended with a tremendous success at the Messier Marathon. It was a momentous set of firsts. At least 4 of the participants successfully viewed the full 110 objects. The first members to the ASLC MM110 group are Joseph Mancilla, Steve Barkes, Steve Smith, and myself. Dave Dockery upped his previous best to 109. There were many other participants including Juan and his wife from Juarez, making this the first ASLC International Messier Marathon. Now I have saved the most prestigious recognition for last. Our own Rich Richins successfully imaged in color all 110 Messier objects at our marathon event. This is a first. To my knowledge this has never in the past 400 years of optical astronomy been done, a truly ground breaking or sky breaking event. The results and proof can be viewed at <http://www.zianet.com/rrichins2/MessierMarathon.htm> Congratulations Rich!!! The event was kicked off with a Pot Luck weenie roast and some camaraderie. Jerry Gaber (me) provided his motor home as a warm room and home made vegetable soup to warm the insides.

The Texas Star Party is just around the corner and a large contingent of ASLC members will be representing us along with a group from El Paso. This is yet another opportunity to commiserate with your fellow astronomers. McDonald Observatory is providing a 36" observing session exclusively for TSP attendees. This will be on Wednesday night up on the mountain!

Join ASLC for the International Day of Astronomy on May 2nd. This year's ASLC Astronomy Day activities will be conducted at the new Mesilla Valley Bosque State Park. The evening will begin with a guided sunset bird stroll followed by music by James Michael. As the sky darkens, views of the Moon, Saturn, and several star clusters and galaxies will be offered. There will be numerous additional activities for the entire family during the evening. Bring dinner and enjoy the sites of (and from) one of New Mexico's newest State Parks. Activities should commence around 6:30 pm.

Your President and humble servant,

Jerry Gaber, 575 382-9183

The Astronomical Society of Las Cruces (ASLC) is dedicated to expanding members and public awareness and understanding of the wonders of the universe. ASLC holds frequent observing sessions and star parties, and provides opportunities to work on club and public educational projects. Members receive *The High Desert Observer*, our monthly newsletter, membership in the Astronomical League, including AL's quarterly *A.L. Reflector*. Club dues are \$35 per year. Those opting to receive the ASLC newsletter electronically, receive a \$5 membership discount. Send dues, payable to ASLC with an application form or a note to: Treasurer ASLC, PO Box 921, Las Cruces, NM 88004.

ASLC members are entitled to a \$10 discount on subscriptions to *Sky and Telescope* magazine.

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This Month's Observer

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Next Meeting

The next monthly meeting will be held April 17th at 7:30 pm in the usual place (Main Campus of the Dona Ana Community College, room 77). The speaker will be Vince Doveydaitis. The topic will be "an affordable infrared photometer."

The Imaging Group will meet at 7:00 pm.

Events

The next monthly dark sky viewing night will be held on Saturday, April 25th at the Upham site. The next moon gaze will be held at International Delights Cafe on Sat. May 2nd. For these and other events, please see the ASLC website for further information:

<http://www.aslc-nm.org>.

May Issue of the *HDO*

A note to all members, we need more contributors ! Sharpen your writing skills, share your knowledge and help bolster our newsletter! Articles for the May issue should be sent to Tony Gondola by the 10th of the month. Text should be sent as email (acgna@comcast.net) or as an attached Microsoft Word document. Images should be sent in jpg format.

If you have any questions about submitting materials for publication in the *HDO*, please don't hesitate to contact me at 571-5118 or via email. Thanks in advance! Tony Gondola, Editor, ASLC Newsletter

April 2009 Meeting Minutes

Call to Order:

Jerry Gaber, President, Astronomical Society of Las Cruces (ASLC), called the meeting to order at 7:30 pm, 27 March 2009, Rm. 77, Dona Ana Community College.

President's Comments:

Jerry Gaber welcomed the group and noted the new members and visitors present. Steve Schaffer is a local resident and re-newing member that last attended a Club meeting in the mid-1960's. Glen Westfall, also a local resident, has obtained a new telescope and learned of the Club at a star party at his daughter's school (El Camino Real Middle School).

Secretary's Report:

The minutes for the February meeting were submitted as published in the current issue of the Club newsletter, the *High Desert Observer (HDO)*. Wes Baker moved to accept the minutes as published, Vince Dovydaitis seconded. The minutes were accepted by acclamation of the members present. There was not an additional secretary's report.

Treasurer's Report:

Because of the treasurer's absence, there was no update on the current balances of the Club's accounts. There was no update on the status of the Meade SolarScope purchase. There was no additional treasurer's report.

Committee Reports:

Observatory Committee:

Rich Richins, Committee Chairman, reports the electrical engineer and contractor are ready to meet with Leasburg Dam State Park (LDSP) personnel. To date, Rich has been unable to make contact with the head ranger at the park, but he is still working the issue. There was no additional progress to report.

100 Hours of Astronomy

Kirby Benson gave a report on plans for this International Year of Astronomy (IYA) 2009 event scheduled for 02-05 April. Most of the observing will be solar on 04 April at various locations around town. Additional volunteers are needed to finalize scheduling the first part of next week. Rich Richins has arranged with Dr. Jim Murphy to participate in the Astronomy Department's monthly open house at the Tombaugh Observatory on 03 April. Wi-Fi is available there and the IYA 2009 event can be tied into there. Wes Baker stated that he had fabricated several "sandwich" boards for Astronomy Day 2008 that he would like to use for this event, but can only locate a couple of them. If other members know of the location of the others, please let him know. He will also have handouts available to segue to Astronomy Day 2009 on 02 May.

Inter-Club Activities

Wes and Carol Baker attended the last monthly meeting of The Albuquerque Astronomy Society (TAAS). TAAS is interested in one major inter-club event at Valley of Fires State Park, possibly in the fall. They're also interested in a less formal get-together, possibly in the Datil area. Wes would like Club members to let him know if they are interested in either event so planning can begin. It was noted that Club member Roy Willoughby has property in the Datil area that may be available for a get-together in the June time frame. TAAS has a club logo license plate and club apparel that can be ordered on-line, something ASLC may consider. Judy Stanley, education director for VLA-NRAO, was also at that meeting and is very interested in having a visual observing event at the VLA. Wes is point of contact.

There were no additional committee reports.

Old Business:

1. Club-logo Apparel – Ron Kramer was not present to provide an update.
2. Meade Solarscope – No update was available (see Treasure's Report above).

There was no additional old business discussed.

New Business:

1. Star Parties – Chuck Sterling, Outreach Coordinator, reported a star party at MacArthur school after TSP, but no other star parties in April. Chihuahua Desert Nature Park (CDNP) will have a star party on 16 May.
2. Wirt Atmar – Jerry Gaber will contact the family regarding presentation recordings and report to the membership.
3. Club Telescope on NMSU campus – This is a historical item that may be better utilized in a museum setting rather than not being used in its current location. Rich Richins suggested not being impatient and rushing to a decision the Club may later regret. A new NMSU museum complex is in the design stages and the telescope may well find a new home there. Vince Dovydaitis reminded the membership that there is a Club-owned dome residing in a pecan orchard in the valley. Dave Dockery pointed out the exceptional quality of the telescope and suggested opening the dome during the Astronomy Department's monthly open house on 03 April. Another possibility is contacting the Museum of Natural History for potential installation in the museum's new facility on the down town mall. Wes Baker is the point of contact for this issue.
4. Earth Day 2009 – This event is scheduled for 18 April. The majority of usual supporters will be leaving for TSP early on 19 April. Right now, the Club cannot support this event.
5. April 2009 meeting – The Board has decided to change the April meeting from 24 to 17 April to avoid conflict with the Texas Star Party (TSP).

Messier Marathon, 2009 – Ron Kramer was investigating obtaining patches. Weather looks good for 28 March, but will be cold. Jerry Gaber will have his RV on-site for a warm-up shelter. Certificates for participants will be presented but Jerry is still working

1. on special recognition for those who get all 110 objects.
2. Mesilla Valley Bosque State Park (MVBSB) – Rich Richins has met with the park rangers at this new state park. He feels the site is similar in many respects to CDNP with good views to the south. The staff would like to schedule events to draw people to the park and Rich is contacting various people that might help with this effort. A MoonGaze at the park is a possibility, including having the Astronomy Day 2009 star party at MVBSB rather than LDSP. Rich will contact the staff and let Wes know their decision to prepare the handouts. Kirby Benson made a motion to change sites of the Astronomy Day 2009 star party to MVBSB, contingent on ranger approval. Dave Dockery seconded. The motion carried.

There was no additional new business for discussion.

John McCullough offered a motion to adjourn and Vince Dovydaitis seconded. The motion passed and the business portion of the meeting was adjourned at 8:10 PM.

Announcements:

1. Galileo scopes – Jerry Gaber ordered the parts and built two versions of Galileo’s telescope for less than \$10 each. He bought extra optics and will build additional scopes as a project for his wife’s school. The plans are in the *Reflector*.
2. AAVSO paper – Vince Dovydaitis is preparing a paper to present at the fall meeting of the AAVSO. He will present it at the Club’s April meeting.
3. Clyde Tombaugh legacy – Vince Dovydaitis and Joseph Mancilla recently attended a meeting of the NMSU Foundation regarding Clyde Tombaugh’s legacy. Clyde and Patsy had collected \$1.2 million to endow an Astronomy chair at NMSU. The Foundation would like to raise an additional \$800 thousand for a total of \$2 million to fully endow the chair. The Foundation would like as much participation from the amateur astronomy community as possible. Vince has volunteered to man a table at TSP 2009 to support fundraising. Signed poster size photos of Clyde will be available for a \$50 donation. The Foundation has set 2 years to meet this goal. Vince would like volunteers from the Club’s TSP attendees to help with this effort.

There were no additional announcements made.

Observations:

No observational reports were presented.

Presentation:

This month’s program was presented by John Peterson, Director, The Gene Roddenberry Planetarium, El Paso, TX. John has been teaching in planetariums for over thirty years. He began his planetarium career at the Allentown Planetarium in Pennsylvania, ran the Clyde Tombaugh Planetarium in Alamogordo from 1981 to 1986, and has been the director of the Gene Roddenberry Planetarium in El Paso since then. His topic was “The History and Future of Planetariums.” From the earliest machines designed to reproduce the motions of the sky, to the

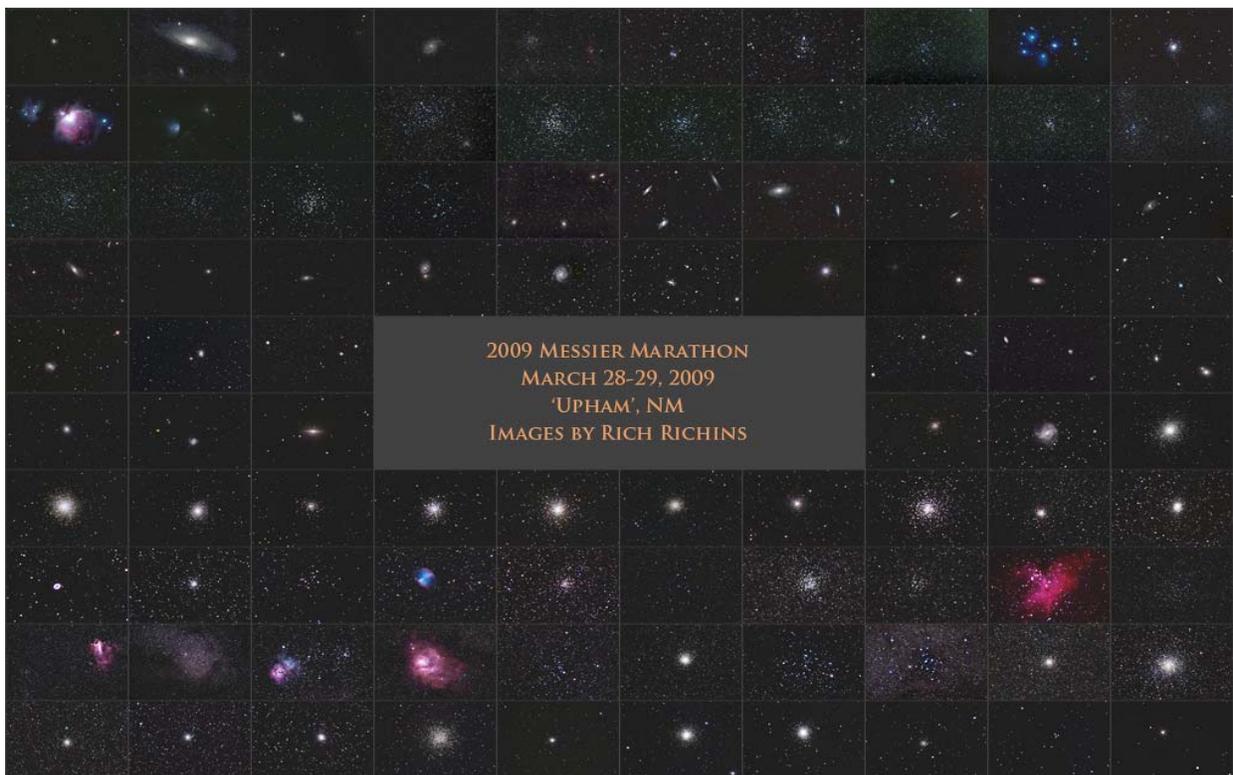
invention of the first planetarium projectors, to the Spitz revolution and the construction of school planetariums in the 60's, to the future digital planetarium revolution, John discussed the evolution of this important tool that has added so much to the field of astronomy education.

This presentation was not recorded for rebroadcast on the Internet. Other meeting presentations can be accessed on the web at <http://www.aicsresearch.com/lectures/aslcnm/>.

The March 2009 monthly meeting concluded at 9:10 pm.

Respectfully submitted by John McCullough, ASLC Secretary

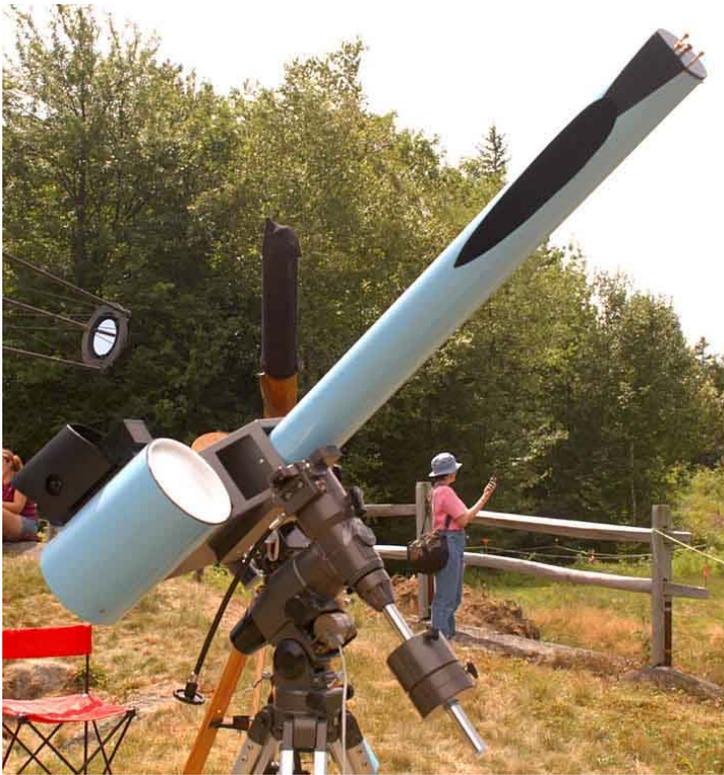
2009 Messier Marathon



Around a dozen astronomers from as far away as Juarez, Mexico, participated in ASLC's 2009 Messier Marathon. The event kicked off with a bbq pot-luck, then turned quiet as astronomers struggled to view the dim early targets (M74, M33). Four dedicated observers (Joseph Mancilla, Steve Barkes, Steve Smith, and Jerry Gaber) had good luck, and were rewarded with views of all 110 Messier Objects at ASLC's annual Messier Marathon (March 28-29). Imager Rich Richins succeeded in imaging the entire set (seen above). Certificates for all those who participated were presented at the April ASLC meeting.

Unobstructed Telescopes, an Overview

By Tony Gondola



David Grotsky's DelMarva TCT

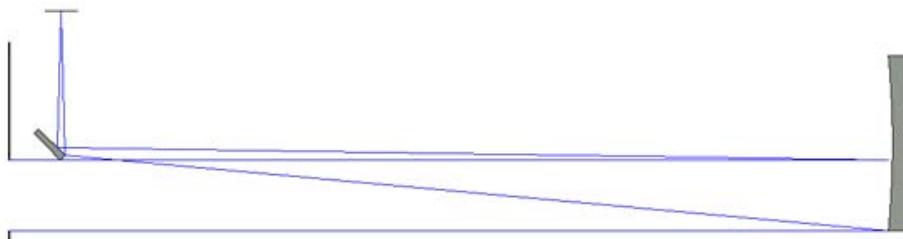
Last month's article covering MTF curves provided some insight into the negative effects of obstructed apertures. This month we're going to look at the various unobstructed designs that are available through modification or custom construction.

The most common unobstructed design is of course, the common refractor - no matter what the design, APO or standard doublet. All refractors benefit from having unobstructed apertures which has much to do with their popularity and the high quality of the images they produce. This popularity persists despite the very high cost of the better systems, even in relatively small apertures.

The next most common system is one anyone can experiment with is the off axis mask. If you take any obstructed design and install an off-axis mask at the entrance aperture you have an instant, off-axis, unobstructed system.

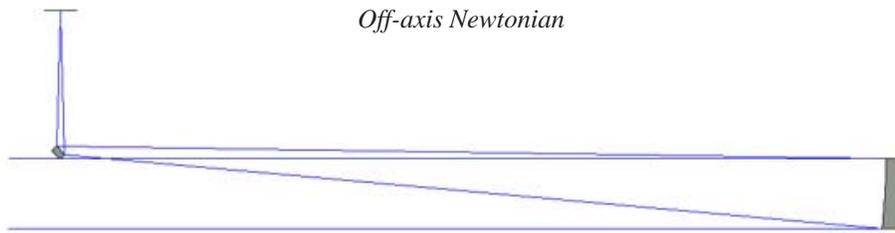
For best results the mask opening should be circular, with a cleanly cut edge. The opening should be just large enough to fit between the edge of the primary and the edge of the secondary. For example a 16" telescope with a 25% obstruction will allow a clean off-axis mask diameter of 6 inches. The working F ratio is simply the mask diameter divided into the system focal length. If our 16" system has a focal ratio of F/4.5 the 6 inch mask will be working at F/12.

For best results the mask opening should be circular, with a cleanly cut edge. The opening



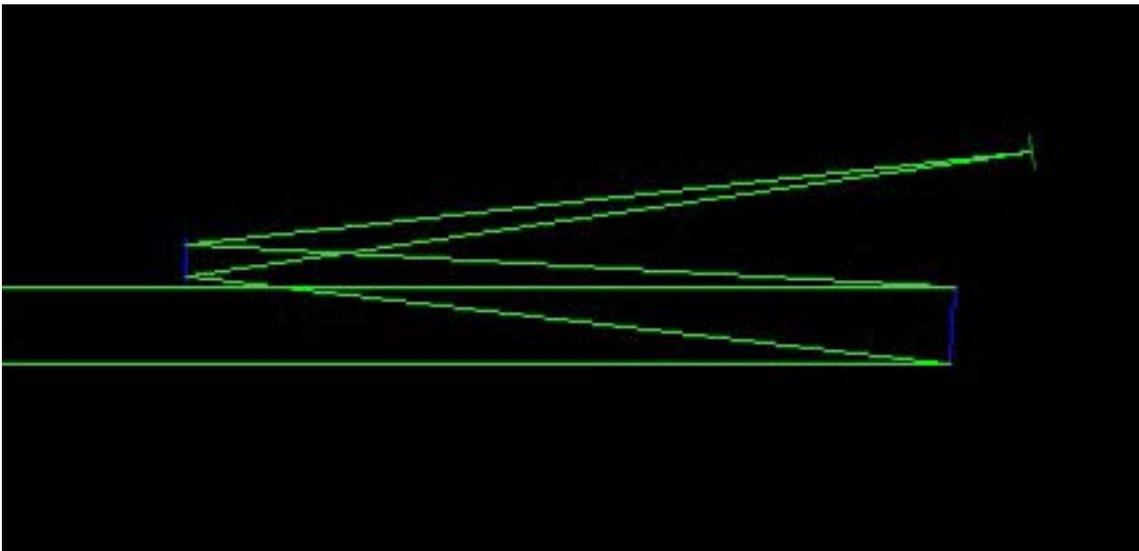
Newtonian with off-axis mask

The next logical progression from the masked Newtonian is to simply take away everything that's not in the light path. When you do that you end up with a true, off-axis Newtonian reflector where the primary is an off-axis section. Off-axis parabolic mirrors are normally made by cutting them out of a large and fast parent mirror. For example, a 16" F/3.5 parent can yield 4, 6" F/9.3 off-axis primary mirrors. Commercially produced OTAs of this type are currently available from both Orion and DGM Optics. If the parent primary mirror is made to a high standard, performance should exceed that of the best APO refractors available. This is a design that I think deserves a lot more attention from the amateur community



At this point in our overview it's time to leave the realm of the Newtonian and begin to explore the world of the Tilted Component Telescope or TCT. Every time you add an additional surface to an optical system it provides the designer with another "degree of freedom" to eliminate system aberrations. This is why there are dozens of variations in the TCT category. We will look at a few of the most important in detail here.

The best design in the two mirror category is the DelMarva TCT designed by David Grotzky. This is an all spherical, two mirror design based on the original "schiefspigeler" design by Anton Kutter. All TCT systems will suffer from coma and astigmatism. The trick that Grotzky has pulled off so well in his design is to balance the aberrations and keep them below the point where they will impact image quality. Here's the layout:

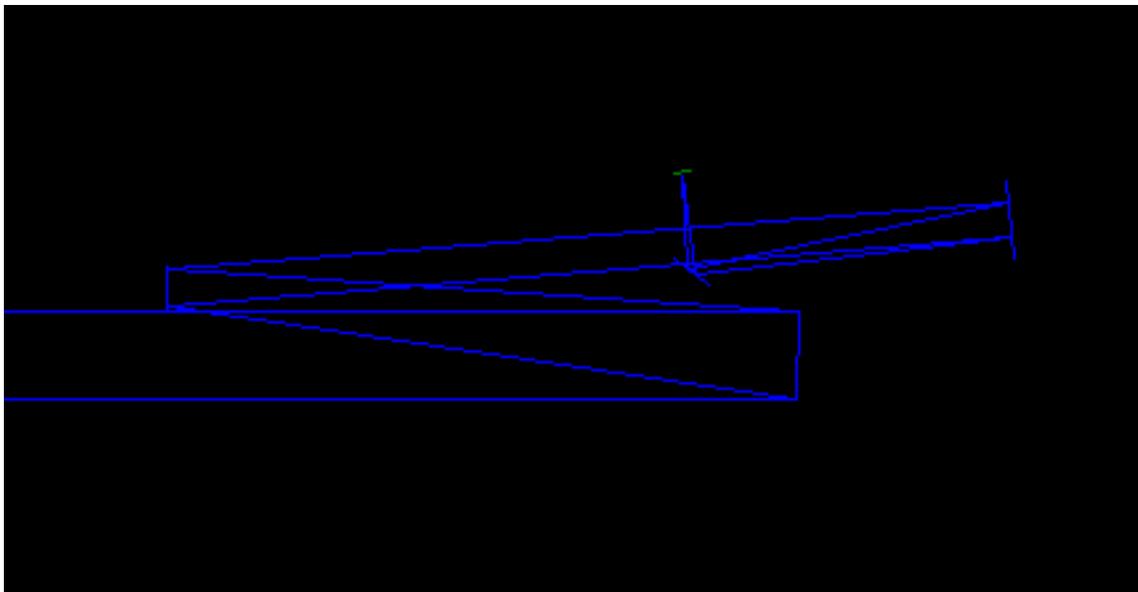


DelMarva TCT

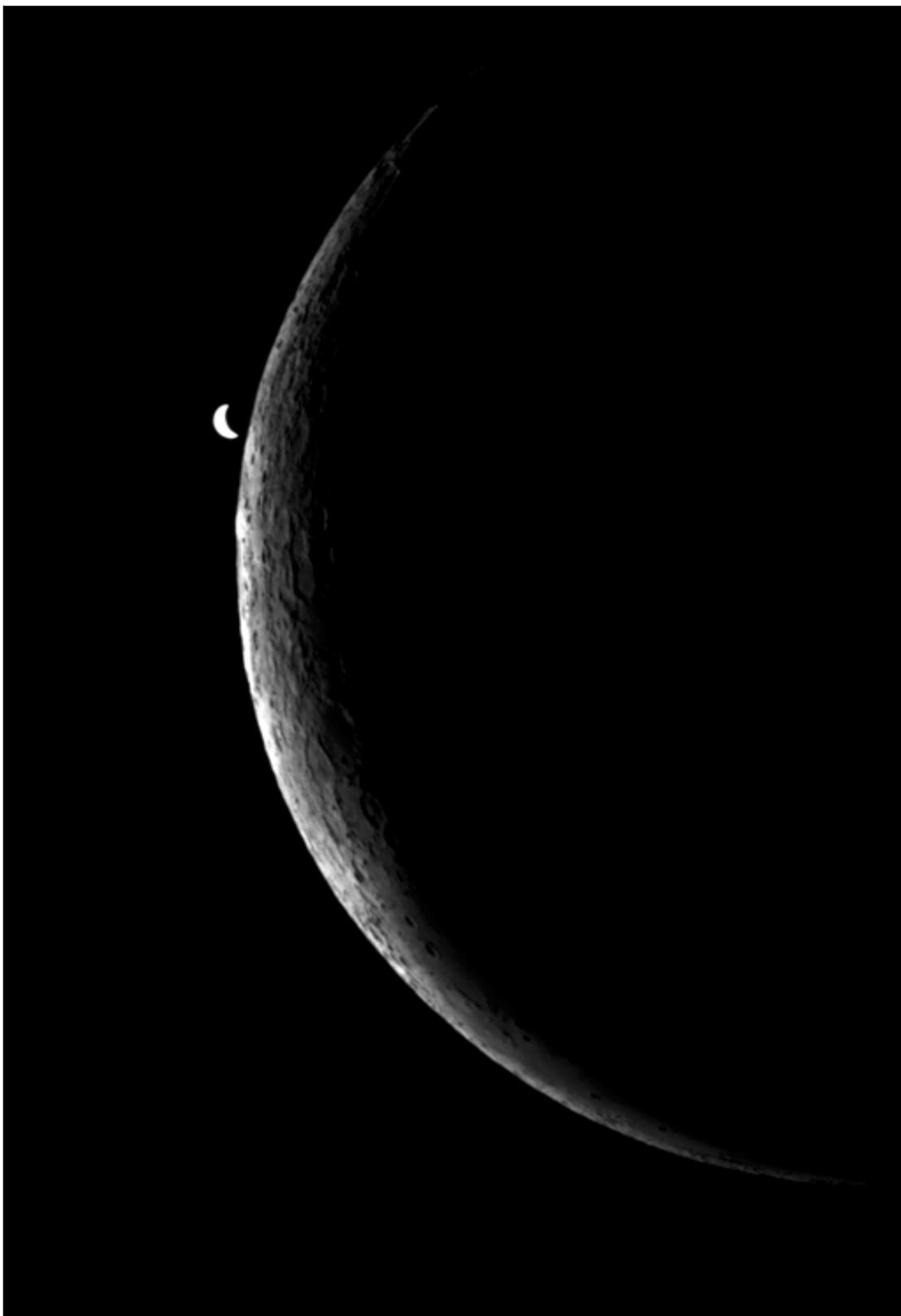
Made properly, this design will deliver a perfect diffraction disk with a Strehl ratio in the mid-90's. The real plus here is that because the surfaces are all spherical and of matching radius, producing the optics to a high standard that will actually deliver that level of performance is fairly easy. Unfortunately, to keep aberrations in check there are limitations on aperture diameter and F ratio. They are also rather large and ungainly in terms of size as they scale up. For these reasons the upper practical limit in aperture for this design is not much above 6".

There are many other varieties of TCT telescopes, including designs that use warped mirrors or toroidal components and corrective lenses to push performance into the realm of larger apertures and fast F ratios. Unfortunately, all of them must be made to exact tolerances in order to perform as expected.

Among all the varieties of TCTs out there, the Stevic-Paul design really stands out as a winner. It's a 4 mirror design that delivers stunning performance at reasonable F ratios and diameters large enough to take you well beyond the smaller refractors. The primary is a standard, fully corrected parabolic mirror just as would be found in a long focus Newtonian; mirrors 2 and 3 are spherical, mirror 4 is flat. A typical working F ratio for this design is around F/11 but that can be made as fast as F/8 with the major limitation being field tilt and the physical layout of the light path. The only real drawback to the system, other than size, is the fact that you have the light losses from 4 reflecting surfaces. This would be a case where you'd really want to take advantage of the latest enhanced coatings to keep light loss to a minimum. Built correctly, performance can exceed that of the finest APO refractors available.

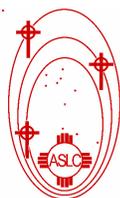


Stevick-Paul TCT



Lunar/Venus occultation, April 22nd 2009
Image by ASLC member Mike Sherick

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