

THE DENVER OBSERVER



Newsletter of the DENVER ASTRONOMICAL SOCIETY

One Mile Nearer the Stars

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The Executive Board conducts the business of the DAS at 8:00 pm at Chamberlin Observatory; please see schedule for day of meeting. Everyone, and their input, is invited.

SCHEDULE

Volume XLVIII,
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February, 2000

February 11 – Friday -- E-Board Meeting @ 8:00 pm

February 12 – Saturday -- Dusk.; Public Open House.

February 18 - Friday -- General Meeting at Olin Hall, D.U. Campus, beginning at 7:30 p.m. Speaker is Dr. Edward Euler. E-Board elections!! See p. # 5 for details.

February 19 – Saturday -- Work Day; 9 am—noon.

March 4 – Saturday -- LOCAL STAR PARTY & Messier Marathon. See p. #5 for directions.

March 10 – Friday -- E-Board Meeting @ 8:00 pm

March 11 – Saturday -- Dusk.; Public Open House.

March 18 – Saturday -- Annual Banquet. See p #5 for details.

March 25 – Saturday -- Work Day at Chamberlin, 9 am to noon.

**** Chamberlin Observatory; Mirror Grinding Class starts at 10:30 a.m. Please see p. 2 for schedule. ****

SKY & TELESCOPE sends only one notice before your subscription ends. Remember, the cost of this, and the other magazines, is over and above our yearly dues. The DAS sends only one issue of The Denver Observer after your dues run out. Also, for questions concerning new memberships, renewal memberships, address changes, and magazine subscriptions, please contact DAS Treasurer Chuck Carlson (chcarlo@du.edu). Send in your money, with the renewal form on the back page to; DAS Treasurer, Chuck Carlson, 1521 South Vine St., Denver, CO 80210-2835

PRESIDENT'S CORNER

Welcome to the new millennium. We are looking forward to moving forward with a new vigor. The next year, we need to concentrate on developing the dark sky site now that the zoning barriers have been removed due to the outstanding work of Wayne

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Kaaz. We will be looking for lots of volunteer labor to get the electricity run, get some pads poured and get a permanent vault toilet working.

Our Web Master, Pat Ryan is resigning as Web Master due to other commitments. I would like to take this opportunity to thank him on behalf of the society for his outstanding contribution to the club and to the astronomy community. He designed and maintained this excellent web site that has been recognized nationally. In addition he is Secretary of the society and writes and publishes the newsletter. We are looking for a new Web Master and Pat says that it will be easy to learn to maintain. The society will furnish software to do the job. We are currently using Front Page 2000 but other programs may be available. Please call or email Larry Brooks at Lbrooks100@aol.com or 303-986-5255 or Pat Ryan at Pryan@du.edu.

If you want to be a web master but would like to volunteer for many other activities, call or email Larry Brooks.

We are still looking for suggestions and ideas on how to keep from removing the Clark 20-inch scope in Chamberlin and to support the university acquiring a research grade telescope at the same time. That will be the best of all situations and it is my hope that we can do both. The University and the DAS have had a long history of mutual support over the years. As many of us know, the Society maintained Chamberlin for many years before Dr. Stencel came on board. We have also provided many years of public outreach for the university. By the same token, the university allowed the DAS to use the observatory and other campus facilities and Dr. Stencel has supported amateur astronomy on the front range. If any members have any ideas please contact either Dr Stencel or myself as soon as possible.

My email address is Lbrooks100@aol.com

CHAMBERLIN OBSERVATORY IN THE 21st CENTURY: BOLDLY INTO THE NIGHT

Dr. Robert Stencel, Professor of Astronomy and Director, DU Observatories

Dear Colleagues:

Since November, your E-board and I have been discussing proposed equipment changes at DU's campus

observatory. Members of the DAS and others are asked to withhold their judgment on the issues, such as those outlined by Ron Pearson elsewhere in this issue, until proposal details can be presented to you in an orderly way. As of deadline, the discussions are continuing and possibilities are evolving, so it could be counterproductive to address emotional arguments and anti-research rhetoric in print. Let's not rush to judge what may be possible in the future, based on isolated failures of the past. Would we have told the Wright Brothers not to try, because man cannot fly? Welcome to the year of the Dragon, with its propitious opportunities.

By any measure, the Clark-Saegmuller telescope is not very compatible with modern focal plane instruments, largely due to mechanical fatigue after 106 years of continual use. The "stairway to heaven" observing ladder is risky for visitors, and not wheelchair friendly. The telescope presently seems idle too many clear night-time hours. However, the lenses, made by Alvan Clark and company ARE jewels, and they deserve to see more starlight. Other observatories have remounted their Clark lenses in order to take advantage of superior, modern mechanical mountings and drives, to add computer control and better support focal plane instruments. A good remount could improve visitor safety and help move toward ADA compliance. This is one of the leading options under consideration at the time of this newsletter deadline. I share the opinion that the Clark optics should remain available for DAS and public viewing of the heavens. But, can we improve on the infrastructure, so that we all can make even better use of a wonderful, perhaps unique, urban observatory?

At the January 29th DAS general meeting, I espoused this, along with three additional principles for how we can proceed to make DU's Chamberlin Observatory fulfill its educational research role in coming decades:

- (1) that the Clark optics continue to be used
- (2) that we seek to improve all telescopes at Chamberlin for education and research, as we must at the University level
- (3) that the DAS role in public outreach be at least sustained, if not enhanced, in the process.

To this I add that we at DU are not about to proceed without first building a consensus with the DAS, and that changes can wait until this comes about. I value the partnership we have enjoyed with

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the DAS and will work with your elected officers to find the best means for mutual benefit.

Quietly Into the Night?
The Chamberlin Observatory, 20 inch Clark
Refractor - Part I

Ron Pearson, DAS, Evergreen, CO

Those of us in the Denver Astronomical Society are privileged at least once each month to have the opportunity to view the moon, planets, stars and even faint nebula through a very unique instrument, the 20 inch Alvan Clark refractor in Chamberlin Observatory. The first views of the heavens, then in the outskirts of Denver came almost 106 years ago, in 1894. Who could have believed in the late 19th century that the great telescope would still be used several nights a week all year long, providing children and students of the 21st century their many outstanding views of the heavens?

Many of us tend to take the great telescope for granted, hardly noticing its uniqueness among telescopes, sometimes cursing its idiosyncrasies and lack of modern technology, or the slight color around Jupiter provided by its not quite perfect lens. But if we stop our rush to boot up our computers for a few minutes and really see the telescope for what it is, a greater appreciation of the telescope will be all we need to quiet the urges that push us to throw out the old.

Most of us can appreciate rare antique cars or paintings by "the masters." Perhaps old castles or muskets from the Civil War catch our interest now and again. A 1930ish Dusenberg car, that today may be worth hundreds of thousands if not millions, represent the highest form of automobile technology of the 30s. Chamberlin Observatory and the Clark 20 inch telescope in particular are living remnants of the middle to late 19th century science and technology. In many ways, because each telescope made by the Clark's was hand-made, each commissioned by a buyer, they are very similar to a work of art by a master painter or a Stradivarius violin. The final figure of each glass surface of each lens was worked individually by a master optician or by Clark himself to produce a quality unparalleled by telescope makers of the time, therefore each is unique. The best source for information about Clark telescopes comes from the book, *Alvan Clark & Sons; Artists in Optics* by Deborah Jean Warner and Robert Ariail. Alvan Clark used his

thumbs to put the final figure on lenses until as an old man they were almost ready to burst as described by one witness quoted in the book.

According to Warner and Ariail, the Clark firm produced about 577 refractor telescopes, over 400 of which were 3 inches to 5 inches in aperture. Only 14 of their telescopes had apertures greater than 16 inches. The listing below will give you an idea of the uniqueness and class of the Chamberlin Clark. I start with the Dearborn Clark, because the Dearborn scope was first acquired by the Chicago Astronomical Society, an astronomical society very similar to the DAS. 1864 18.5 inch Dearborn Observatory - still in use at Northwestern University.

1894 20 inch - Chamberlin Observatory - (Boyden type) still in use.

1921 20 inch - Wesleyan University - current status not given.

1882 23 inch - Princeton University - now at Roper Mtn. Science Center Greenville, SC

1893 23 inch - Harvard College (University) - photographic doublet

1896 24 inch - Lowell Observatory - still in use

1873 26 inch - US Naval Observatory - still in use

1884 26 inch - University of Virginia - still in use

1883 30 inch - Pulkowa Observatory Russia - in storage or lost

1888 36 inch - Lick Observatory - current status not given.

1897 40 inch - U. of Chicago, Yerkes Observatory - still in use.

The Chamberlin Clark is unique even among this class of large refractors. The note to "Boyden type" refers to the lens of the 20 inch that was made for astro-photography at a time when astro-photography was in its infancy. According to Warner and Ariail, Edward Pickering, director of Harvard Observatory, helped the Clark's design a crown glass that is more convex on one side than the other. The lens can be then used for both visual and photographic use. For visual use the side with less curvature is in contact with the flint lens (p.28 W&A). This type of lens was designed in 1887 apparently for observing expeditions to Peru which are referred to as "high altitude Boyden investigations" for Harvard. Only 3 other Boyden type Clark lenses are noted; a 13-inch, a 12-inch and a 10-inch, all constructed for Harvard (p.108). Warner and Ariail failed to make special note of the Chamberlin Clark except in their catalog,

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listing it as a Boyden type. To the curious historian there must be a story there. Exactly what connections did Dr. Alonzo Howe have with Dr. Pickering and the Clark's to learn of the Boyden type of lens design and what were his photographic ambitions for the 20 inch lens? It was the largest lens designed specifically for astro-photography of the time!

Being of long focal length its most obvious use would have been for photographing the planets and double star positions. The close approaches of Mars in the late 1880's and 1890's inspired Percival Lowell to commission the 24 inch Clark refractor for his search for the canals on Mars in 1894, the year Chamberlin opened. But the Chamberlin 20-inch opened its doors to the public for visual viewing from the very start, and its visual use has dominated our thinking and impressions of the scope. When was the last time the lens was turned around for photography, or does anyone know what position it is in today?

It has been argued by some on the E-board of the DAS that the Chamberlin Observatory Clark telescope has never produced anything of scientific note or special and therefore is not worthy of maintaining. But that is judging the primary sole purpose of this type of instrument from a late 20th century perspective of high-tech-big science. Today, the primary function of observatories and most 'professional' astronomers is pure research. Investigating the largest and smallest questions and theories of the universe and then publishing as many papers about the research as possible in prestigious scientific journals with 10's of co-authors on 'your team.' No one from the public sees these articles and only a few can understand them. In the late 19th century the split between 'amateur' and 'professional' astronomers was only just beginning. Today, Leif Robinson Editor of Sky and Telescope, thinks they are coming back together.

It is noteworthy that the list of comparable telescopes presented above are almost exclusively the largest most prestigious colleges or universities of their time and are still today. But you'll notice that they are predominantly private colleges, not state schools like CU. With the exception of Harvard College Observatory, Warner and Ariail note that only a few of these telescopes were engaged in 'original research.' These instruments served a much 'higher' purpose. American colleges in the late 19th century main goal was, according to Warner and Ariail, "to strengthen the mental and moral faculties

of their students, and even the science courses were directed to this end." Today we call these 'liberal arts' institutions. Astronomy was a science, but a science that could show people the hand of God in natural laws and the wonders of the universe. Several other sociological reasons for these observatories are discussed, including one more relevant today than at any other time, a means of escape for the over-worked! As stated by Warner and Ariail, astronomy, and its support by private philanthropic means of very expensive instruments, represent the finest part of the Gilded Age," it offered a rational recreation that promised to improve one's character and enhance one's appreciation of God's universe." I am sure that there are probably many in the DU faculty, administration and alumni that still see these 'liberal arts' values as the values and vision of the University of Denver. This is part of the historical context that makes Chamberlin Observatory AND the Clark telescope worth preserving.

Most products of our modern technology are in the junkyard within a few years. The 18.5-inch Dearborn refractor (built during the Civil War) continues to serve university students and the public after the modern Lindheimer Astronomical Research Center (LARC) consisting of two 'modern instruments', was blown up in 1995 after only 30 years on the Northwestern University campus, 10 miles outside light polluted Chicago. The reasons as stated: "The [Northwestern] University,...made the decision to raze the structure because air pollution and ambient light from Chicago had made it unfeasible to conduct astronomical research in the twin-dome [40-inch & 16-inch Cassegrains]...LARC had not been used for research for 10 years or for student instruction for the last two years. The capacity for now obtaining digitized astronomical images from the more powerful research instruments throughout the world contributed significantly to its lack of use...The astronomy curriculum will utilize computer-based programs to expand instructional techniques...Astronomy students can continue to observe stars...using the 18-inch telescope housed at Northwestern's remaining astronomical research facility, the Dearborn Observatory..."(Sep. 18, 1995 Northwestern Observer).

The 'new' telescopes were transferred to Lowell Observatory in Flagstaff Arizona. The 18-inch Dearborn mount has been upgraded and computerized (by Melschiemer) and is now doing CCD imaging as well as visual astronomy for the public and students.

The Clark refractors are an enduring product of both

science and art. The 20-inch Clark telescope has wow'd tens of thousands of children, facilitated research science in college students, and created awe in adults for over 100 years. I can think of few other examples of the products of American civilization in the 19th or 20th century that have endured and succeeded like the telescope in Chamberlin Observatory. Even Russ Mellon, (designer of the planned new telescope) bemoaned seeing his ultra-high-tech works go on the scrapheap shortly after being built for Lockheed or the AirForce. It may or may not be feasible to build a 36-inch or 50-inch telescope in downtown Denver that can reach magnitude 23 stars, as claimed by Mellon, (Jan.28, 2000). DU astronomy students should have the opportunity to try. But should a national, state and City of Denver historical treasure, like the 20-inch Clark Refractor, be gambled and lost to all in the process? I don't think so.

sources:

1. *Alvan Clark & Sons; Artists In Optics*. Deborah Jean Warner, Robert B. Ariail 2nd Edition. Willman-Bell Inc. 1995.
2. "Lindheimer Observatory Comes Down". from the Sep.18, 1995 *Northwestern Observer*. <http://www.nwu.edu/univ-relations/media/observer/1995-96observer/miscellaneous/lindheimer-misc.html>
3. Mellon, Russ. Denver Astronomical Society, Monthly Meeting Jan. 28, 2000.

February Speaker

The speaker for February 18 will be Dr. Edward Euler of Lockheed Martin. Dr. Euler is Program Director of the Mars Surveyor Program. He will give us a debriefing on the Mars Polar Lander. He will discuss the future of Mars missions. Dr. Euler received a NASA Public Service Award for his participation on the Viking Mars Lander Program. He earned his B.S. in Mechanical Engineering and his Ph.D. in Space Science from Northwestern University.

Annual Banquet

March 18, Saturday

The banquet will be held at *Dardano's Restaurant* again, 11968 W. Jewell Ave. Cash bar from 6:00 - 7:00. Buffet dinner from 7:00 - 8:00. Speaker at 8:00. Served at your table: coffee or tea, homemade bread, and cheesecake. Served on the buffet line: roast beef, chicken ernesto, Italian sausage, lasagna, cavatelli, cheese ravioli, fettucine, alioli, mixed Italian vegeta-

bles in butter sauce, broccolli with a cheese sauce.

The speaker will be *Dr. Jo Ann Joselyn*, an Astrogeophysicist with C.U., and Secretary General of the International Union of Geodesy and Geophysics. (Geodesy is the study of the Earth's surface.) Her subject will be "Space Weather and how the Sun Affects Weather and Storms on the Earth."

The banquet will be \$17.00 per person. Send your check to Chuck Carlson, DAS Treasurer, 1521 S. Vine St., Denver, CO 80210, by March 11, although you can pay at the door, also.

Rich Lane

Officer & E-Board Nominations

President; Larry Brooks: **Vice President;** Ed Kline **Treasurer;** Chuck Carlson: **Secretary;** Pat Ryan **Executive Board (eight members);** Ron Pearson, Jack Eastman, Dan Wray, Greg Marino, Rich Lane, Debra Sorg, Joe Gafford, Ivan Geisler, Wayne Kaaz, Ed Kline, Pat Razor, Brad Gilman, Bill Ormsby, Bernie Presser, Dennis, Cochran, Chuck Carlson, Pat Ryan, Ted Cox

Elections will take place at the February 18 General Meeting. Further nominations will be possible before the voting starts.

The DAS Deer Trail Dark Site is located about 60 miles due east of the Mouse Trap. To get there, take I-70 east to the Deer Trail exit (exit 328), turn left at the end of the exit ramp and turn left again after you pass the Texaco station on to CR 217. Take CR 217 a little over 1/2 mile to CR 34 and turn right (East). Stay on 34 about 6 miles until you get to CR 241. Turn left (North) on CR 241 and continue about 1.5 miles; there's a culvert with a wide gate on the right (East) side of the road.

OBSERVERS WANTED

Monitor faint variable stars with the 20 inch telescope at Chamberlin Observatory. Part time: late nights and/or weekends. \$10/hour. Training available. Contact the Director, rstencel@du.edu.

Mirror-Grinding Classes

The schedule for mirror-grinding classes is as follows: February 5, 19; March 4, 18. These are at 10:30 AM. Please call Terry Chatterton at 303-621-2442 for more information.

About the Denver Astronomical Society

The DAS is a group of amateur and professional astronomers sharing a mutual interest in the heavens. The DAS operates the University of Denver's Chamberlin Observatory with its venerable 1894, Alvan Clark, 20" refracting telescope. Our members have been involved with the first public planetarium at the Denver Museum of Natural History and the Smithsonian Astrophysics Observatory's "Moon Watch" program. The DAS successfully petitioned to have the Chamberlin Observatory listed on the National Register of Historic Places.

Our Credo is to provide members a forum for increasing and sharing their knowledge, to promote and to educate the public about astronomy, and to preserve the historic telescope and observatory in cooperation with the University of Denver. To these ends we have established three tax deductible funds; the Van Nattan Scholarship Fund, the Chamberlin Restoration Fund, and the DAS Dark Site Fund. This last fund was established to construct and maintain observing facilities sites near Deer Trail in eastern Colorado.

Please call our Info Line at (303) 871-5172 and drop by one of our General Meetings. Become a member and enjoy speakers, facilities, events, and our monthly newsletter, The Denver Observer.

Application for Membership to The Denver Astronomical Society

() New () Renew

Name: _____
 Address: _____
 City: _____
 State: _____
 Zip: _____
 Home Phone : _____
 Work Phone: _____
 E-Mail: _____
 Occupation: _____
 Other Interests: _____
 (Associates Only) School: _____ Grade _____
 Do you want this information **kept out** of the yearly roster?
 Yes _____ No _____

Please Circle All That Apply:

Regular - \$30 Associate - \$10 up to age 22 \$ _____
 Sky & Telescope/\$29.95 Astronomy/\$29 \$ _____
 Dark Site Fund Donation\$ _____
 VanNattan Scholarship Fund\$ _____
 Chamberlin Fund Donation\$ _____
 Total Amount Paid\$ _____

Complete this form, or a copy, and send it with a check or money order payable to The Denver Astronomical Society to: DAS Treasurer, Chuck Carlson, 1521 S. Vine St., Denver, CO 80210-2835



Denver Astronomical Society

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