

# FOCUS

DELAWARE ASTRONOMICAL SOCIETY

Next Meeting – December 16, 2008 at 8:00 PM

~**CHRISTMAS PARTY!!**~

with DAS' Goodwill Ambassador, Al Weber

~ Please Join Us for Fellowship and Fun ~



Vol. 53, No. 10, December, 2008

FROM THE PRESIDENT ■ *Hank Bouchelle*

Greetings of the Season to all!

Many thanks to Bob Mentzer for his excellent talk on *Tycho and Kepler* last month. It was another great program!

This month's meeting features our annual Christmas party. Bring some goodies to share! Our meeting also features an Al Webber mini-talk on a planetary model. It should be interesting.

## Speaker Programs for the Coming Months

- Jan. 20** *Bob Summerfield (2008 Luther J. Porter Educator Award recipient)*  
**Topic to be determined**
- Feb. 17** **Mini-talks:**  
*Gus Swartout on the Messier Marathon*  
*Dave Groski on the Spilhaus Space Clock*
- March 17** *Anthony Nicastro, West Chester State University*  
**Topic to be determined**
- April 21** *Hank Bouchelle* **Gerard Kuiper**
- May 19** **Dinner Meeting:**  
*Sally O'Byrne--*  
**Legends of the Night**
- June 16** *Billie Westergatrd*  
**Dynamics of Black Holes**

## DAS BOARD MEETING

7:00 p.m., December 16, 2008  
at the Mt. Cuba Astronomical Observatory

### Agenda:

- Review of November's minutes
- Treasurer's Report – Bob Mentzer
- Standing committee reports/requests/notes
  - Focus/Publications – Joe Neuberger
  - Library- Glenn Bentley
  - Education Programs- Bob Karcha
  - Sawin Observatory Tom Sidowski
  - Observing – Greg Lee
- Astronomy Course Update?
  - Dates
  - Curriculum revision
- Speaker topic determination
- Summerfield
- Expanding use of e-mail list v. including items at the website
- Forward Planning
  - Anniversary of the telescope and Galileo's observations
  - Others?
- Refreshment Chair
- Facility lock-up
- Awards Committee
  - LJPE Award
  - Astronomer of the Year Award
- Chartered Awards Committee
- Other?

*Each issue of FOCUS is full of dozens of useful hyperlinks. Just click on any graphic or HTTP address and your browser should take you to the relevant web location and resources.*

## COMING EVENTS at the OBSERVATORY...

### MCAO PUBLIC NIGHTS ■ Emil Volcheck



The Mt. Cuba Observatory Public Nights continue year round! In addition to learning about many aspects of the heavens, you'll have a chance to visit and view our new all-digital full-dome planetarium, one of the first of its kind in the entire United States! You can pick up a schedule when you next come to a meeting - or get the latest updated version off the website at: <http://MountCuba.org>. Programs are presented on Monday nights at 8pm. Some upcoming events are:

Dec 15 - Susan Thompson - "The mystery of the star with too many metals."

### STAR PARTIES AT MT. CUBA ■ Tom Sidowski

Star parties are usually held on the grounds of the Mt. Cuba Astronomical Observatory. You can bring your own scope or just come to observe through others. Telescopes in use may include the club's 12.5" Newtonian reflector, 17" Coulter Odyssey 2, or 6" Orion SkyQuest XT6 Dobsonian (when not on loan). Star parties are always weather permitting.

### PLANETARIUM FULLY OPERATIONAL ■ Scott C. Jackson

Any one who knows how to do live shows can do that now. The automated shows that Rob Lancaster had put together are not there because they got lost when the hard drive was reformatted some time ago. We are working on getting a few automated shows. But we are now fully operational.

### LOANER TELESCOPES ■ Tom Sidowski

One of the best advantages of being a member of the Delaware Astronomical Society is that all members have the privilege of being trained to use and then borrow equipment owned by the club for personal use. Currently, we have two scopes available for loan: a Celestron 8" Schmidt-Cassegrain, and a 6" Orion SkyQuest XT6 Dobsonian reflector. The loan is for at least a month. If you're interested in checking out either of these scopes, contact Tom Sidowski at 239-1844.



### MAGAZINE SUBSCRIPTIONS ■ Bob Mentzer

You can now mail *Sky and Telescope* subscriptions, at the club rate, directly to S&T. If the renewal card says \$32.95 you will save 5 cents over the \$33 we charge for a renewal. Both S&T and *Astronomy* send out renewal notices about 6 months before your subscription expires. These renewal forms don't have the expiration date for your subscription. But this information is part of the mailing label that is printed on the front cover of each month's magazine. So if you're not sure of your expiration date, check the magazine label before you send S&T a check. *Astronomy* subscriptions must still be processed through the club to get the favorable subscription rate.

### DAS VOLUNTEER NEEDED ■

The club needs a volunteer for what we anticipate will be a more extensive use of our email list to alert members of important events related to Astronomy and the club. It won't take up much time at all and anyone interested can contact any Board member directly or email the FOCUS editor at [JRNeuberger@gmail.com](mailto:JRNeuberger@gmail.com).

### 2009 OBSERVER'S HANDBOOKS ARE IN! ■

The handboks are in. Pick yours up at the December meeting. I ordered extra, so see me for a copy. The price is \$18 and you can pay me later. Robert Mentzer-764-1926-[RobMentzer@comcast.net](mailto:RobMentzer@comcast.net)

### DAS FORUM / E-MAIL SITE ON YAHOO

■ Don Shedrick

This is a restricted e-mail service for use by DAS members for DAS purposes. To use this site, go to <http://groups.yahoo.com>; search for Delaware Astronomical Society; and click on the link that comes up. To join, you must have a Yahoo ID and password; if you don't, you can register at this time by following Yahoo's instructions. You will then be allowed to "Join the group" upon clicking in that box. You must then register for the DAS group and add your profile by clicking on "add new profile" and completing the form. When adding or editing your profile, you will need to enter your actual name in the "Real Name" box so you can be identified as a DAS member so Don Shedrick can approve your application to join the DAS group, and everyone will know to whom they are communicating. Finally, specify your desired email address for delivery of messages. Note- you may choose to not have your name and email address displayed to anyone other than DAS members who are members of the Yahoo DAS email group.

For more detailed instructions, go to the DAS website under DAS Resource Links.

**DAS ASTROPHOTOGRAPHY SPECIAL INTEREST GROUP ■** *Bill Hanagan*

The AP SIG will meet on Friday, January 9 at 7:30 P.M. at Mt. Cuba. The main topic for discussion will be the various types of noise in electronic sensors including CCD and CMOS based cameras. The DAS astrophotography special interest group (DAS AP SIG) meets on Friday nights at 7:30 P.M. every other month at Mt. Cuba regardless of weather. The SIG also meets for photo shoots scheduled on 1-2 day notice to synchronize with the weather.

The monthly meetings are informal and typically include the presentation of astrophotos taken by the members along with an extended question and answer period. Objects commonly photographed include constellations, auroras, lunar eclipses, and planetary photos, as well as a wide variety of deep-sky objects such as nebulae, galaxies, star clusters, etc. The topics discussed cover the entire gamut of astrophotography, from how to get started with a minimum of equipment, to polar aligning your telescope, all of the way to the fine points of using auto-guiders and post-processing digital images.

You can get started in astrophotography with just your current camera mounted on a tripod or a motorized telescope by taking wide field photographs of meteor showers, conjunctions, constellations, and star trails. As you move to progressively fainter and smaller subjects, you'll need better equipment. Joining the AP SIG is a great way to learn what equipment you need and what works well before you spend your money.

If you are interested in joining the AP SIG, just email your name, address, and phone number to me at [hanaganw@comcast.net](mailto:hanaganw@comcast.net) (using "@" and "." in place of ? and ?).

Finally, please consider submitting one or more of your favorite astrophotos for publication in the Focus. You can email your photo(s), along with a brief description of how you made them, to our *FOCUS* editor, Joe Neuberger at ([JRNeuberger@gmail.com](mailto:JRNeuberger@gmail.com)) . Please include a brief description of how you made each photo along with a by-line so each photo can be properly credited.

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**DAS AMATEUR TELESCOPE MAKING SPECIAL INTEREST GROUP ■** *Bill Hanagan*

The DAS Amateur Telescope Making (ATM) Special Interest Group (SIG ) meets on evenings and weekends according to the availability of the members and the particular projects that are underway. Currently the ATM SIG has a medium Dob building program under way. The general range of activities of the ATM SIG includes all manner of telescope making, mirror making, and the making of accessories for telescopes and observing.

Anyone interested in joining the ATM SIG should email their name, address, and phone number to me at [hanaganw@comcast.net](mailto:hanaganw@comcast.net) (using "@" and "." in place of ? and ?). Meeting dates are announced primarily by email, so if you are interested in telescope making, be sure to let me know!

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**SAWIN OBSERVATORY REMINDER ■** *Tom Sidowski*

The DAS maintains a club observatory on the grounds of the Mt. Cuba Astronomical Observatory. The Sawin Observatory houses the club's permanently mounted 12.5" reflecting telescope and a 17.5" Coulter Odyssey 2 Dobsonian telescope. It is for

the use by club members once they are trained and checked-out in a simple operating procedure. Members who are interested in becoming key holders of the Sawin Observatory should contact me at 239-1844 to arrange for training in the use of the facility.

# Mid-Atlantic Mirror Making Seminar #9 ■ Bill Hanagan



On the weekend of March 20, 21, and 22, 2009, the Delmarva Star Gazers will host their Ninth Mid-Atlantic Mirror Making Seminar. For pricing, registration and other details, go to the Delmarva Stargazers web site at <http://www.delmarvastargazers.org> and look for the link on mirror making. You can make a very good 6", 8", or 10" Newtonian primary mirror at this seminar and learn a lot about mirror making in the process, all while enjoying the company of other amateur telescope makers and amateur astronomers. If you already have an unfinished mirror in this size range that you would like to finish it, or you would like to re-figure an existing mirror, the seminar is a great place to do it. And, if you hope to eventually make a mirror for a large aperture Dobsonian telescope, making a smaller mirror is an essential first step along the way.

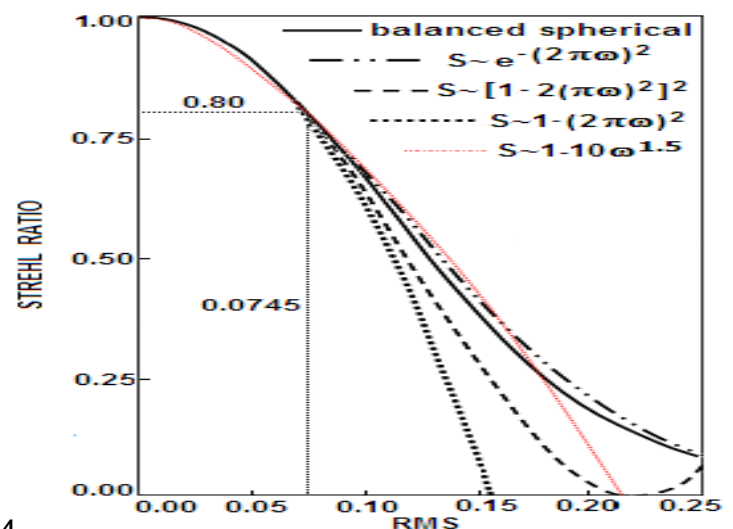
Since Mirror Making Seminar #5, I've helped out by instructing mirror makers and by leading them through the process of making a Newtonian primary mirror. However, the seminar is hardly a one-man show. Don Surles and many other Delmarva Stargazers have organized the event and handle the logistics of setting up and tearing down the operation, as well as putting great food on the table. Several DAS members in addition to myself have also contributed to the seminar over the years, most notably Dave Groski. Dave has lead participants through special projects such as the making of Schiefspiegler optics and the assembly of a solar prominence telescope. He has also coached mirror makers during the testing and final figuring of their mirrors at several previous mirror-making seminars. DAS members Bill McKibben, Ted Paras, Marc Hutton, Rob Lancaster, and Rich LeMay have also "pitched" in to help out at the seminar. Finally, Steve Swayze, a professional optician from Portland, Oregon, has flown in for every one of these seminars from #1 on in order to test mirrors and provide the participants with figuring advice.

You might ask, how good are the mirrors being made at the seminar, and how do they compare with commercial optics? I have tested a number of Newtonian primary mirrors that were finished at previous Mirror Making Seminars and all have had peak-to-valley (P-V) wavefront errors of 1/6 wave or lower ( $\lambda=550\text{nm}$ ), with a **Strehl<sup>1</sup> ratio** of 0.85 or better. Combined with a top quality secondary mirror (a story for another time), these primary mirrors allow the complete telescope to achieve an error level  $\leq 1/4$  wave P-V on the wavefront, with a **Strehl  $\geq 0.80$** , which is known as the "**Rayleigh Criterion**."

Reducing the combined optical errors of a telescope down to the level of the Rayleigh Criterion leads to major improvements in telescope image quality. Further reduction of the optical errors will yield continued but diminishing improvements in image quality down to 1/10th wave P-V error on the wavefront (Strehl  $\geq 0.96$ ). Reducing optical errors below this level yields no visually detectable improvement in image quality.

In addition to the mirrors made at the seminar, I've also tested the optics from three popular telescope lines. The primary mirrors in those telescopes typically suffer from 1/2 to 1 wave P-V error on the wavefront (Strehl ratio  $< 0.8$ ). The secondary mirrors are often even worse. It's no exaggeration

<sup>1</sup> The Strehl ratio is the ratio of the amount of light falling in the Airy disk at the center of the diffraction pattern compared to the theoretical maximum for perfect optics. A Strehl ratio of 0.80 results from 1/4 wave of spherical aberration on the wavefront and hence matches the well-known "Rayleigh Criterion". This is the error level at which diffraction starts to limit optical performance. Note, however, that while diffraction becomes the main factor determining image quality at this point, other errors continue to degrade image quality until they are reduced to roughly 1/10th wave P-V error on the wavefront (Strehl  $\geq 0.96$ ). A Strehl ratio of 1.00 indicates "perfect" optics.



to say that a good many commercially made telescopes suffer from errors greater than 1 wave on the wavefront. Once in awhile, the optics in a mass-market telescope will meet or even surpass the 1/4 wave Rayleigh Criterion, but this is rare in my experience. To give one example, I have a mass-market telescope that was advertised as a “diffraction limited state of the art optics design”. It has 10 waves of chromatic aberration and about 3 waves of astigmatism on the wavefront. Sadly, I have seen other commercial telescopes that make that look good.

If you don't want to make your own primary mirror, and you still want high quality optics, what can you do? One approach is to buy a telescope from a higher end product line or a “boutique” manufacturer, but this costs more. And, while the chances of getting good optics are much higher that way than if you go bottom fishing to get the lowest price, you still have no guarantee that the optics will meet any well defined quality criteria.

Another approach to getting good quality optics is to buy your telescope on a “satisfaction guaranteed” basis and establish at the time of purchase exactly how many days you have to return it if you should find it to be unsatisfactory. Then, immediately after buying your telescope, COLLIMATE the optics (another story for another time). Then test the optics using the Ronchi eyepiece test and the star test. These tests can tell you a lot about the quality of the optics and they are dirt cheap to do, but you need to learn how to use them and practice them ahead of time to become proficient in their use.

If your optics test poorly after being collimated and thoroughly cooled, either return the telescope for a refund or ask the store manager how they propose to correct the problem. If you decide to go along with what the store manager suggests, be sure to reserve your right to return the product for a full refund if the proposed fix doesn't work to your satisfaction. Some stores will not accept the return of anything you received in exchange for an earlier return. Before you accept a replacement,

ask about what options you will have if the replacement fails during testing.

Finally, if your telescope is under warranty but you have no option to return it, here's what you can do. Collimate it and test it. If the optics fail the test, prepare yourself to convince the manufacturer's rep that the optics are indeed defective. Then, call the manufacturer and ask for a warranty repair. The more confident and knowledgeable you sound, the more likely the manufacturer will do something to fix the problem. On occasion, a manufacturer may actually refigure your particular optics, but it is far more likely that they will substitute a set of optics that are

somewhat better than what you received initially. Don't wait until the warranty period is close to expiring to do this because the process takes time and your chances of getting the manufacturer to resolve a problem decline steadily starting on the day you buy your telescope. And, if the replacement optics are no better, you will need “warranty time” left to get the problem resolved.



Engineers at Axsys Technologies work with one of the mirrors of the James Webb Space Telescope. Credit: Axsys Technologies

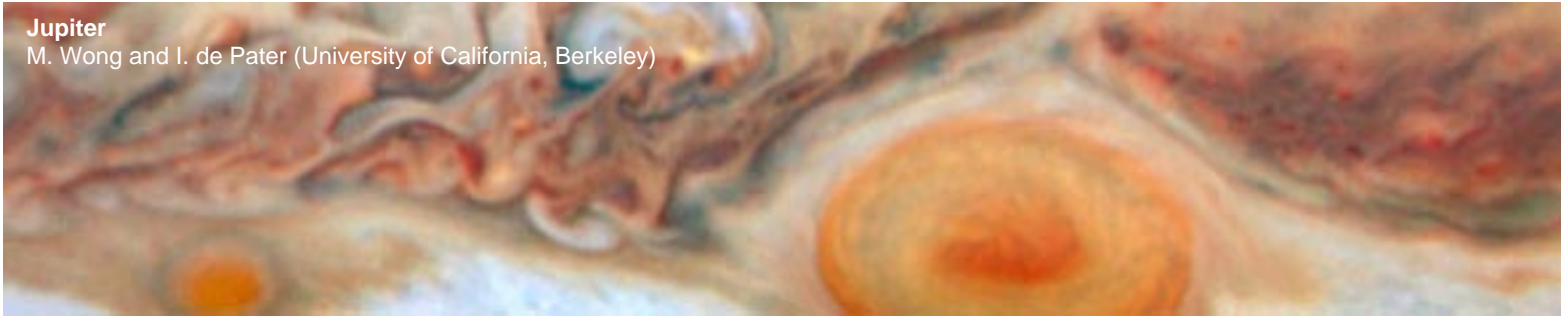


#### MEMBERSHIP EXPIRATION NOTICES ■

If you receive the *FOCUS* by email, you will be notified by email. If you receive it in the mail and the mailing label on the envelope containing your *FOCUS* is marked with Red Marker, your membership is expiring or has expired. To continue to receive the *FOCUS*, *Sky and Telescope* or *Astronomy*, and *Reflector*, send the renewal form below with your check to: DAS, c/o Robert Mentzer, 605 River Road, Wilm., DE 19809

#### LIBRARY NEWS ■ Glenn Bentley

The DAS Library would like to thank Michael Cimorosi who has donated additional titles to our collection. I invite the membership to drop by the library during our Christmas Party to check out the new materials and I would like to wish everybody a Merry Christmas and a safe and prosperous New Year.



**Messier Marathon** ■ *Gus Swartout*

**March Event – Remember to set your calendar for March 27 for a pleasant evening of searching the night sky for those elusive beauties. The Messier Marathon is back for all those who wish to join us on the shore of the Elk River. The marathon is not a race but a gentle competition to find all 110 objects before sunrise. The only restriction is that this is a manual event. So those Go-To scopes will not be plugged in. Our site is located 15 minutes south of Elkton. There are bathroom facilities and hot drinks and food for all. Stay the evening or for just a few hours. All are welcome. For more information please contact Gus Swartout.**

**AWARDS COMMITTEE SEEKS**

**DESERVING NOMINEES** ■ *Gus Swartout*

**The DAS is currently soliciting its membership for nominations for both the Amateur Astronomer Award and the Luther Porter Award. Please be aware that Amateur Astronomer Award is awarded to a member of the DAS while the Luther Porter Award is open to the general astronomical community. Last year's Amateur Astronomer Award recipient was Bill McKibben. Bill's detailed photos can be found on our own Focus monthly news letter. The 2007 Luther Porter was awarded to Bill Summerfield. You can find Bill on the WEB at <http://www.astronomytogo.com>. Nominations can be submitted to any of the committee members; Bob Karcha, Bill McKibben and Gus Swartout.**

**DELAWARE ASTRONOMICAL SOCIETY  
BOARD OF DIRECTORS' MEETING MINUTES  
November 17, 2008**

PRESENT: Hank Bouchelle, John Case, Bob Mentzer, Lynn King, Bill Hanagan, Dan Chester, Glenn Bentley, Bob Karcha, Rene Van Caneghem

TREASURER'S REPORT: Bob M. reviewed finances. Report attached to hard copy of the minutes.

LIBRARY: Glenn B. - No report. FOCUS: No report from Joe N.

STAR PARTY AT CAROUSEL FARMS: Per Lynn K. Greg Lee was there. Even though it was cloudy about 10-15 people showed up. They are planning to have one in the spring and hope for better weather. Event was advertised on NCC cable Ch. 22.

EDUCATIONAL PROGRAMS: Bob K. It was mentioned a while ago about changing the astronomy course – dividing it into two three-week courses. He is working on it.

CHRISTMAS MEETING: Put the word out to bring goodies.

SPEAKER - NICASTRO: Topic "The long term survivability of biological species in space" set.

SPEAKER – SUMMERFIELD: History of Astronomy on the Go. How he got started, what is its purpose, etc. Having problems getting in touch with him. He will keep trying.

EMAIL ALERTS: Instead of having email alerts for upcoming astronomical events put in calendar form in the Focus. Include items from one month's meeting to the next. Could still send out special alerts e.g. monthly star parties, weather alerts.

FORWARD PLANNING: Bill H. has not been able to get in touch with Keith Love.

DISCOVER MAGAZINE: Rene V. brought to Board's attention that Discover Magazine has astronomy related articles. He would like to see it in the Library. The DAS doesn't subscribe to magazines. He was advised to check with Emil if MCAO might be interested.

2009 - YEAR OF ASTRONOMY: Hans Lippershey's patent application in 1608 earliest recorded of existing telescope. Galileo built telescope following year 1609.

STUDY GUIDES FOR INTERNATIONAL YEAR OF ASTRONOMY from Astronomical Society of the Pacific: They have a guide for each month. Hank will resend email with attachments. If DAS is going to do something, these would be a good resource.

DARK SKY ASSOC: Bob M. received information re: joining. MCAO is member. Lynn K. has been working with county council-person to upgrade lighting in her neighborhood to meet County Code standards. She used the site for backup information given Delmarva Power to support need to replace old lights with new ones. It was moved and seconded that the DAS should join the Dark Sky Assoc.

REFRESHMENTS: Tonight and December Party covered. Cost of refreshments will be reimbursed. Hank B. will announce we are still looking for a refreshment chair.

Respectfully submitted,  
K. Lynn King, Secretary

# INTERNATIONAL YEAR OF ASTRONOMY 2009

## THE INTERNATIONAL YEAR OF ASTRONOMY KICKS-OFF IN JAN.

FEATURED NIGHT SKY NETWORK ACTIVITIES FOR JANUARY  
HAVE GREAT EDUCATIONAL MATERIALS AVAILABLE FOR DOWNLOAD


January  
Telescopes and  
Space Probes: Today's  
Starry Messengers



Featured Activity:  
**Ready to Observe?**  
Understanding What You Will  
See at the Telescope

Featured Observing Object:  
**Venus**

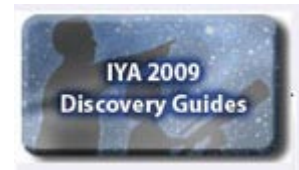
THE UNIVERSE  
YOURS TO DISCOVER



INTERNATIONAL YEAR OF  
ASTRONOMY  
2009

Click any graphic to be taken to fantastic web resources available throughout the IYA's 12 months!

Use this guide to discover the excitement of the International Year of Astronomy.



Learn about Venus this month and use the "Are You Ready to Observe?" activity to get your eyeballs primed to look up.

January 2009  
IYA Discovery Guide:  
**Telescopes and  
Space Probes:  
Today's Starry  
Messengers**



## Night Sky Network

Astronomy Clubs bringing the wonders of the universe to the public

## ASTRO-PHOTO of the MONTH for DECEMBER

*FOCUS* needs your photos. PLEASE send to editor at [JRNeuberger@gmail.com](mailto:JRNeuberger@gmail.com)

### Biggest Full Moon of the Year

No, you can *not* see Neil Armstrong's footprint.

But go ahead and look:

The full Moon of Dec. 12th is the biggest and brightest full Moon of the year.

In 2004, Greek amateur astronomer **Anthony Ayiomamitis**

photographed an apogee Moon and a perigee Moon, and set the images side by side to show the difference.

His photo appears at right.



# DAS CONTACTS

Please call any of us with your concerns!

Membership: Any of the following:

*President:* Hank Bouchelle-----302-983-7830  
*Vice President:* John Case -----302-836-4888  
*Secretary:* Lynn King ----- 302-764-8816  
*Treasurer:* Bob Mentzer----- 302-764-1926  
*DAS/MCAO Advisor:* Emil Volcheck---610-793-5156  
*Education Chair:* Bob Karcha-----302-999-9509  
*Messier Club:* Lynn King -----302-764-8816  
*Observing:* Greg Lee -----302-762-5358  
*Youth Coordinator:* Sarah Baird ----302-561-0810  
*Archivist:* Rene Van Caneghem --- ----410-392-3718  
 MCAO Web Page: [www.MountCuba.org](http://www.MountCuba.org)

Board Members at-large:

*ATM and AP SIGs:* Bill Hanagan -----302-239-0949  
*Chairman, Observatory Committee and Monthly Star Parties:* Tom Sidowski -----302-239-1844  
*By-Laws:* Henry Bouchelle -----302-983-7830  
*Light Pollution Strategist:* Greg Weaver-302-239-1338  
*Library Chair:* Glenn Bentley -----610-869-0706  
*Ad Hoc Star Parties:* Sheila Vincent----302-322-4739  
*Elections Comm. Chair:* Sarah Baird--302-561-0810  
*Awards Comm. Chair:* David Swartout--302-836-4618  
*FOCUS Editor:* Joe Neuberger-----302-655-2142  
 DAS Web Page: [www.DelAstro.org](http://www.DelAstro.org)



## FOR NEW MEMBERSHIPS or RENEWALS

If you have questions, call any of the member representatives listed. Otherwise, just check the appropriate boxes and complete the form below. Print it or cut it off and send it with your check to Bob Mentzer at his address on the form. The magazine prices are group rates to DAS members. If you're just joining us for the first time,

**THANKS, and welcome to the DAS!**

## MEMBERSHIP or RENEWAL FORM

Please make checks payable to DAS, c/o Robert Mentzer, 605 River Road, Wilmington, DE 19809

New Member   
 Renewal

Senior/Family Membership	\$20.00	<input type="checkbox"/>
Junior membership (16/under)	\$10.00	<input type="checkbox"/>
Sky and Telescope Magazine	\$33.00	<input type="checkbox"/>
Astronomy Magazine	\$34.00	<input type="checkbox"/>

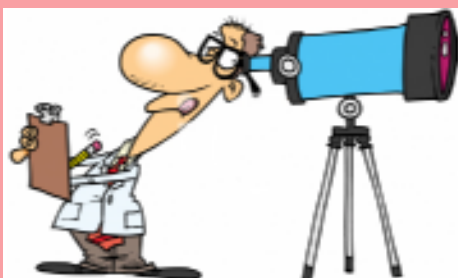
NAME \_\_\_\_\_

STREET ADDRESS \_\_\_\_\_

Total Submitted \_\_\_\_\_ \$

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_ TELEPHONE \_\_\_\_\_

E-MAIL ADDRESS \_\_\_\_\_



The Last Word  
 ■ FOCUS editor  
 Joe Neuberger

# Season's Greetings!