



Charlotte Amateur Astronomers Club www.charlotteastronomers.org

Next Meeting: Friday January 18th, 2019

Time: 7:00 PM

Place:

**Myers Park Baptist Church
Education Building – Shalom Hall (Basement)**

Address:

**1900 Queens Road
Charlotte, NC 28207**

CAAC January 2019 Meeting

Exploring the Impact of Substellar Objects on Late Stellar Evolution

Planets and brown dwarfs in close orbits around main sequence stars will interact with their stellar hosts once they ascend the red giant branch. The details of these interactions and their outcomes are currently unclear. Recent discoveries of brown dwarfs orbiting post-red giant branch "hot subdwarf" stars imply that (i) the angular momentum resident in an orbiting substellar object is sufficient for ejecting the outer layers of a red giant's atmosphere and (ii) the substellar object can survive this interaction. More than a hundred new eclipsing hot subdwarf binaries with cool, low-mass companions have recently been discovered by large photometric surveys like the Optical Gravitational Lensing Experiment (OGLE) and UNC's Evryscope project, increasing the number known systems by nearly a factor of ten. Over the next several years, our research group at HPU will work with international collaborators to obtain follow-up spectroscopy and determine the stellar masses in these systems. The companion mass distribution resulting from this work will allow us to determine whether there is a lower mass limit for substellar objects to eject a red giant's envelope and survive engulfment, as suggested by theory. Here I give a brief overview of this work and discuss progress towards our science goals.

Speaker

Dr. Brad Barlow joined the Department of Physics at High Point University as an Assistant Professor in 2013. Before moving to the NC Triad, he completed his Ph.D. in the Department of Physics & Astronomy at UNC-Chapel Hill in 2011 and spent two years as a Postdoctoral Research Scholar at Penn State University. His research primarily focuses on pulsating stars, late stellar evolution, and binary star systems. He has also collaborated on research projects involving pulsators in the Kepler field, X-ray binaries, white dwarfs, and exoplanets. While at Chapel Hill he helped develop software for the Goodman spectrograph on the 4.1-m SOAR telescope on Cerro Pachon in Chile. In September 2018, the National Science Foundation awarded his research group a three-year, \$349,621 grant to study the effects small objects like planets and brown dwarfs might have on the evolution of stars like the sun. Originally from Biloxi, Mississippi, Brad did his undergraduate studies at Mississippi State University. His other interests include playing the piano, writing music, cycling, and public outreach.



From the President

We are again at that time of year when the Board of Directors is tasked with putting forth a slate of officers and directors for another year. Per our constitution the new board and officers are elected at the April meeting and take office at the conclusion of the May meeting. Several existing members are willing to continue but we also have several vacancies due to members wanting to roll off after serving the club in the various offices. Please let me know if you have interest in serving as an officer or member of the board.

Ken Steiner
President

CAAC Treasurer's Report as of 12/31/2018

Part 1 of 2

Operating Fund

Purpose: Enable the CAAC to pursue our non-profit goals, maintain our facilities, and run our programs:

- Funds are acquired through ongoing receipts of dues, fees, and annual net Southern Star income (or expense).
- Funds are expended to meet operating obligations of the club.

1	Operating Fund Balance: 10/31/18/2018	\$13,231.45
2	Income	
	Dues & Fees	1620.00
	Pad Fees	175.00
	Expenses	
	GHRO Expenses	1433.15
	GHRO Utilities	495.16
	Fees for Credit Card Service	49.74
3	Meeting Expense	371.15
	Outreach Expense	14.22
	Endowment Setup	275.00
	Lifetime Member Mag Subscription	65.90
4	Operating Fund Balance: 10/31/2018	\$12,052.99

Part 2 of 2

Non-Operating Funds

Purpose: Administer gifts and donations for designated use.

1	Balance 9/30/2018: Non-Operating Funds	
	Scholarship Fund	5989.36
	Contingency Fund	28,038.94
	Long-Term Fund	7205.79
2	Income	
	Donation: Microsoft, BofA, Other	40.00
	Interest	2.07
	Expenses or Transfers	
3		
	Balance 12/31/2018: Non-Operating Funds	
	Scholarship Fund	5989.36
	Contingency Fund	28,038.94
	Long-Term Fund	7247.86

Annual dues for our fiscal year October 2018 through September 2019 will be due beginning October 1. We can accept your renewals either through the membership link on the club website www.charlotteastronomers.org or by cash or check at our next meetings. Dues are \$60 for the year and include access to the Gayle H Riggsbee Observatory (GHRO) in SC.

Benton Kesler
CAAC Treasurer

CAAC Outreach Updates

CAAC Outreach need boots on the ground with scopes for upcoming events. Check the CAAC Night Sky Network Events Calendar for more details.

As of this publishing, I am stepping down from my position as Outreach Coordinator

If you are interested in getting more involved with CAAC Community Outreach or interesting in becoming Outreach Coordinator please contact Kevin Moderow, kevinmoderow@gmail.com

*Kevin Moderow
Outgoing CAAC Outreach Coordinator
kevinmoderow@gmail.com*

Secretary's Report:

ATTENTION:

If you are a former CAAC member and have not been keeping up with your membership dues, firstly please come back! We'd love to reconnect you with the love of astronomy through our club, use of GHRO observatory, and the camaraderie of our members.

Please also remember to return your badges on the table near the exit at the end of the meeting before you leave! Doing this will significantly reduce the chances of badges getting lost and reduce the amount of time (and cost) of having to re-create your name tag if it is lost. Thank you!

Register with the **Night Sky Network!** It is imperative that all members of the CAAC join the Night Sky Network (NSN). Many of the clubs outreach activities are managed by the NSN, as well as club communications (newsletters, event notifications, general email). The NSN is a wonderful tool specifically designed for amateur astronomy clubs like ours. Membership allows you to contact other members via email, and receive last minute updates for outreach events via text message:

http://nightsky.jpl.nasa.gov/club-apply.cfm?Club_ID=1468&ApplicantType=Member-Pre-Monthly

Meeting Gathering Several CAAC members gather at Panera Bread (601 Providence Road, just a few blocks from our meeting place) at 5:30 prior to the monthly meeting. Anyone interested in sharing a meal with them is welcome.

From the 2019 Southern Star Planning Committee

Southern Star is fast approaching!

Save the dates for April 4 through 7.

Registration will open in early February and registration forms and information will be available on the CAAC website charlotteastronomers.org/southernstar

We have an exciting program with excellent speakers from UNC Chapel Hill, NC State, Southwest Research Institute, and the Antique Telescope Society, speaking on topics such as formation of large scale structure in the universe, a history of space art, the geology of Venus, early American telescopes and their makers, the possibility of life on the icy moons of Jupiter and Saturn, and more!

Join us and enjoy the camaraderie of fellow astronomers at beautiful Wildacres Retreat, with excellent meals, social events, swap table, door prizes, and other activities such as a nature program and visit to a local artisan. We look forward to seeing you there!



Southern Star 2019 ASTRONOMY CONVENTION



APRIL 4 – 7



Dr. Dan Durda
Southwest Research Institute

- *The History of the Astronomical Art: From the Renaissance to the Space Age*
- *The Science and Exploration of Little Rocky Worlds*



Dr. Paul Byrne
North Carolina State University

- *Does Venus Show Us What Ancient – and Future – Earth Looks Like?*
- *Is There Life Inside the Icy Moons of Jupiter and Saturn?*



Dr. Sheila Kannappan
University of North Carolina – Chapel Hill

- *The Visible and Invisible Cosmic Web*
- *Truth and Awe in Astronomy*



Ken Launie
Antique Telescope Society

- *Early Telescopes in America and Their Makers*
- *Russell Porter and the Garden Telescope*

Come to the Wildacres Retreat in the Blue Ridge Mountains

- **Great accommodations and meals**
- **Nature hike and visits to local artisans**
- **Night-time observing under DARK skies!**
- **Door Prizes!**
- **Wine and Cheese Reception**
- **Swap tables! Trade and sell - Trash to Treasures !!**
- **Ice Cream Social !**

Adults 18+ : \$290 College Student ID: \$180
Child 6 – 17: \$115 Child 3 – 6: \$80 Under 3: Free
Day Attendee: \$60 (each day, meals available separately)

REGISTRATION form (February)

www.CharlotteAstronomers.org

News from GHRO

1. There was a large turnout for the January star party on January 5th, at least 20 people descended on GHRO for a great evening of star gazing and friendship.
2. There are two new observatories being constructed the week of January 14-19 south of the 24". Please be careful if you are visiting the all-member's pad during this time.
3. The CAAC sponsored star party for February is February 9 but there will be NO telescope training in February. The next scheduled training will be March 16. Please see the club calendar for future star party and telescope training dates.
4. Please come down and use the outstanding facility. Remember, it's your observatory, so please use it. We do ask that you clean up before you leave. A good practice is to act as if you are going camping...pack out what you pack in.
5. The owners of the new observatories will be holding an open house later in February, the date and time will be announced at the February club meeting...stay tuned.

GHRO Information (see <http://1drv.ms/1m2wPUj>)

GHRO is located at [1427 Bloomwood Drive, Lancaster, SC](#). (some GPS show city as Pageland). Gravel road leading to the observatory is located 5.22 miles east of the "522 Grill" on Taxahaw, Rd.

Facebook FAQ

<https://www.facebook.com/CharlotteAstronomers/> scroll down to NOTES, then Frequently Asked Questions page for more information about GHRO. Be sure to share your astronomy photos and observing tips.

Night Sky Network -- "Heading to GHRO"

For updates on GHRO, be sure to join the <https://nightsky.jpl.nasa.gov/index.cfm> "Heading to GHRO" message group.

Jim Gaiser, Director GHRO.

As always, we care about the safety and security of all visitors to our observing facility, the GHRO. To keep us all mindful for the need to keep alert while visiting the observatory, we provide the following reminder. Please share this with your family and any visitors who may join you at the observatory.

***** WARNING *****

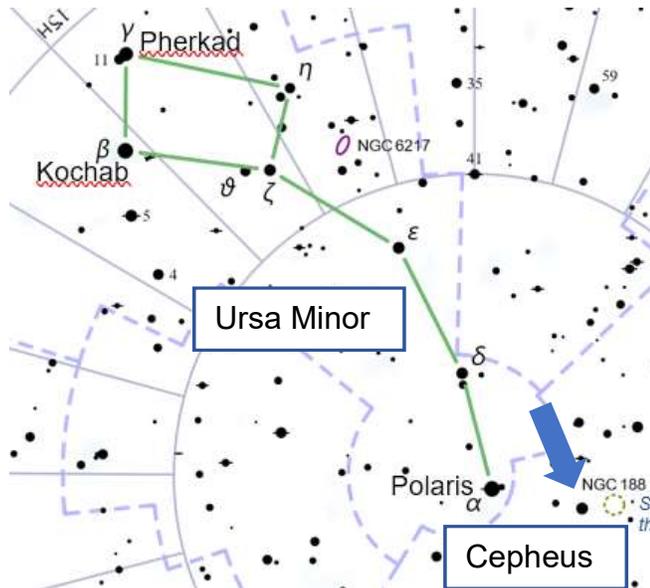
This facility and adjoining area may contain uneven terrain, dangerous wildlife, low light conditions, and dangerous man-made obstacles.

By using this facility, users assume the risk of personal injury, and loss or damage to personal property. All persons should use extreme caution at all times.

Users of this facility agree to hold harmless the Charlotte Amateur Astronomers Club, its Directors, and its members for any and all injuries sustained while participating in club activities or using this facility.

January Sky Challenge

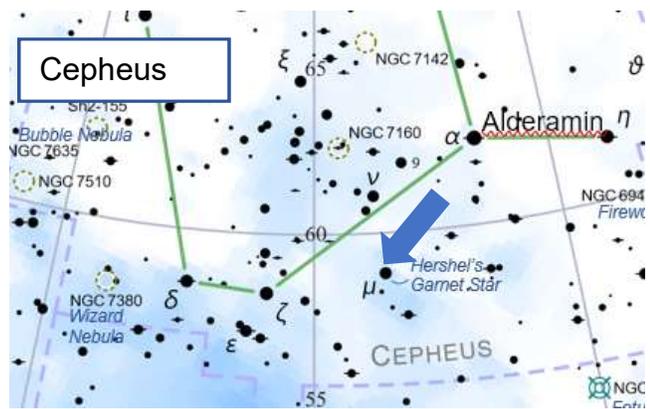
Are you looking for something to discover in the night sky? Try these with a modest size telescope, with some patience and persistence! Or come down to the GHRO and get a really fine look! Start the year looking North in Cepheus: a cluster and a red star.



On clear, chilly evenings, the dim constellation Cepheus is high in the north swinging above the pole. The stars of Cepheus are mostly 3rd magnitude or fainter, and not a single deep sky object here made it onto Messier's famous list. On the other hand, Cepheus has a galactic cluster of unusual interest: **NGC 188**. Located only 4° from Polaris, the North Star, NGC 188 consists of about 130 stars ranging from 12th to 17th magnitude. Together, they merge into an 8th-magnitude glow spanning some 15'.

While some keen-eyed observers have detected the dim presence of NGC 188 in 7×50 binoculars on extremely clear and dark nights, the cluster's low surface brightness usually makes it a difficult find even in 4-inch instruments. With a 6-inch rich-field telescope, NGC 188 appears as a soft glow,

speckled with tiny, often elusive, individual stars. Through a 10-inch or larger aperture the view is spectacular, and the whole field is scattered with diamond dust.



Strongly colored stars have always fascinated astronomers. The long history of red-star observations begins in the early 19th century, with famous observers such as Angelo Secchi and Thomas Espin. And those who think that stars are not highly colored need only look at **Mu Cephei**. Often called "**Herschel's Garnet Star**" (honoring both this cool, red star and William Herschel, who discovered infrared radiation), the color of this 4th-magnitude star, easily found in the constellation Cepheus, will leave you dazzled. The deep orange-red color of this red giant is nicely brought out in 10×50 binoculars.

Classed as an M2 Ia supergiant, the "Ia" implying the brightest kind, Mu Cephei is among the most luminous and largest stars in the Galaxy. The Garnet Star is seen to radiate 350,000 times more energy than the Sun,

Acknowledgements:

NightSkyInfo www.nightskyinfo.com/archive for target descriptions, adapted.

Mag Star 7 Star Atlas Project © 2005 Andrew L. Johnson for star maps (clipped)

Edited by Mark Hoecker

What's Up in the Sky?

Highly Recommended Download and print a good *FREE* star map (including interesting objects to look for) monthly from:

Skymap <http://www.skymaps.com/downloads.html>

You'll also find a good monthly sky map in each issue of *Sky & Telescope* or *Astronomy* magazines.

New to the Night Sky?

Are you puzzled by folks in the club who point up in the sky and say "There's Gemini... and you can see Leo rising over there...and doesn't Regulus look clear tonight"? Are you trying to figure out where those darn constellations are? Those large star atlases are pretty intimidating... confusing... and expensive.

A good starting point could be called, *My First Star Atlas*... but in reality it is 4 simple but very helpful *FREE* star chart pages from the Stephen F. Austin State University – called **SFA Star Charts**. Pages 2 & 3 show you about 90% of everything you need to get started. There are even a couple pages that explain how to use a star chart. Clear and straight-forward.

Go to this link and print out the pdf file on the largest paper you have available, though standard letter paper is fine:

<http://observe.phy.sfasu.edu/SFAStarCharts/SFAStarChartsAll.pdf>

While these charts do not show the myriad of deep sky objects, they DO show the constellations and brightest stars – a good introduction to the night sky!

Happy Observing!

An **ENHANCED** Star Atlas – **FREE!**

Our CAAC member, Mark Hoecker, has used the *Mag 7 Star Atlas – Color Milky Way version* (available on the internet) and added some enhancements including:

- A star map index to quickly identify the individual star chart you are looking for.
- Blue directional arrows at the edge of each chart guiding you to the adjacent chart. Also large numbers were added in the lower right corner, helpful when thumbing through the charts.
- Finally, he manually added common star names and numbers to the charts, helpful in finding your way around the sky.

NEW Revision... Coming Soon!

Such enhancements are available under a Creative Commons License by Andrew L. Johnson, author of the original charts.

SUGGESTION: While printing at the largest paper size you have available is helpful, a great alternative if you have a "letter size" color printer with a manual auxiliary feed slot, is to print on "legal size" (8½ x 14-inch) heavy paper or even "card stock". You could also punch holes and place in a legal-size report cover available at office supply stores. You would then have a wonderful star atlas to help you through the night skies!

If you have access to a color printer that can print on 11 x 17-inch paper (or card stock), you can print a magnificent copy whose readability will rival that of very nice, commercially available atlases.

To download your **Mag-7 Star Atlas Milky Way version – ENHANCED**, go to the CAAC website and scroll down the left column to "Mag 7 Star Atlas" and follow the link.

Happy Observing!

CAAC CONTACTS

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Public Outreach Coordinator	TBD	