NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

JULY 2017

PRESIDENT'S NOTES

It's July everybody, time again for some clouds.

I admit I've been a bit disconnected from the sky this year. I've been doing some travelling to parts of the country that normally have moisture, so I've seen more than my share of clouds and rain. But it seems that every time I return there are clouds here as well. Now it's time for monsoons, so as I wrote last year, the time has come again to clean, maintain, stow, ready your equipment, and ready a plan for observing this fall. The monsoons will end, and we'll all want to hit the sky flying, observing on all those clear nights.

Many of you well-seasoned observers already have to do lists and logbooks at the ready. Your equipment is (finally) polar-aligned and perfectly balanced, ready to slew-to and track miniscule faint fuzzies objects at a moment's notice. However, a growing number of our club's membership are newbies. They are just now experiencing those same stumblings in the dark that everyone must go through: just getting their scopes to work consistently, figuring out what magnifications to use, trying to view objects they've read about, and maybe take that dreamed-of shot of the moon or a planet or the Orion Nebula.

I am here to tell everyone all that it is OK to stumble, to get confused, but don't stay that way. If those confusing situations and equipment problems lead to questions, they can become positive situations. Once you can form a question to ask you are on your way out of the morass. This club has a vast reservoir of institutional wisdom with an openness that, frankly, is hard to equal. Just ask your questions at the club meetings, on the HAClist, or Facebook, and you will not only find the question is not dumb but that all those seasoned observers have been there in that same place at least once. I'm not saying you will you ever find complete enlightenment, no this is just a hobby. But, you will find a direction away from the problem you're having.

Case in point, I've spent the last few years (since moving down here) just getting adjusted to the sky and working on updating my equipment and software. Looking at and imaging mostly targets of opportunity has been my only game plan. Yep, I've snatched up the "M"s as they peaked, the brighter NGC objects, and tried to view and capture as many comets as I could. I've even tried my hand at minor planet occultations and planetary nebula imaging (from the Astronomical League's list that Ted Forte, our illustrious treasurer, compiled). What has been the result of all these less than formal observations? Am I doing science, no. Am I working on a life list, not really. What is the point? Fun! I've had mass quantities of fun just observing, just imaging, just futzing with the equipment – practicing, learning. Do I want to do more? Maybe. Science? Maybe. Do I still want to do everything? Yeah, I think so.

Maybe you want to do everything, maybe not. However, more probably you don't know what you want to do, yet. You really just want to know how to do something, anything. There are several perks of HAC membership that might help your "situational", situation. Two of these are discounts on the major US astronomical publications for the amateur astronomers, Astronomy and Sky & Telescope. Reading through a year or two of these magazines will instill greater astronomical knowledge and information on current telescopes, eyepieces, planet and deep sky filters, and the like, than all your trips through the unfenced, unfocused internet. These publications are far-ranging in their scope (no pun intended) so you will get a sampling of all the major and minor astronomical fronts. All it takes is to contact Ted Forte, treasurer@hacastronomy.com to get instructions on how to secure your discounts. The club also offers annual discounts on Astronomy Calendars and the very popular Royal Astronomical Society of Canada (RASC) Observer's Handbook. Singly or as a whole, the club contacts and these publications form your first, best chances for success in a hobby that will last a lifetime.

Clear Skies Everybody; no, I mean it.

WELCOME OUR NEW MEMBERS

Bonnie Main of Sierra Vista joined HAC at the June meeting. Also joining in June, Micah, Loreley and Ellen Dravland are our newest military family to join the club. Welcome! We are glad you joined.

AMAZON SHOPPERS

If you are an Amazon shopper, please remember to enter the Amazon website by clicking the link on the club website www.hacastronmy.org. As an Amazon Associate, HAC gets a nice donation whenever you make a purchase, if you use the link.

MATCHING GIFT OFFER (IDA)

Donations to the International Dark Sky Association (IDA) made in July are eligible for a matching gift program that

doubles the value of your donation. Please consider making a tax-deductible donation to IDA this month. The sky you help save may be your own!

A note to our newer members

If you joined HAC in 2016, your club dues may be coming due. Please watch your email for a dues notice. On the anniversary of your joining, you are asked to pay a prorated amount to adjust your membership expiration to December, to synch up with the majority of the membership. After that, your annual dues will be paid each December. You can pay your prorate anytime. If you are not sure of when you joined, or how much you should pay you can check with the treasurer, Ted Forte, either at the meeting or by email (tedforte511 at gmail dot com). Our members are very important to us; we hope you won't let your membership lapse.

Dues can be paid in person by cash or check, via snail mail by check (PO Box 922 Sierra Vista 85636) or online (www.hacastronmy.org) using your credit card or PayPal account. If paying a pro-rated amount on-line please be sure to use the "donate" button so you can adjust the amount.

Don't miss out on member benefits

HAC members enjoy a number of benefits. Membership in the Astronomical League is one. It entitles our members to receive the quarterly Reflector magazine and makes them eligible to earn observing program and other awards. The AL store often has great deals and discounts on products and services you want and the AL website contains a wealth of information for observers of all experience levels.

HAC members can receive discounted subscriptions to Astronomy and Sky & Telescope magazines. (See the treasurer for information).

HAC offers its members volume discounts on the wonderful RASC Observer's Handbook each year and half price discounts on the Astronomy Magazine's Deep Space Mysteries Calendar.

HAC is a member of the NASA Night Sky Network and our members have access to a wide variety of educational and informative materials.

Perhaps the best benefit of all is being a part of a vibrant and active club of dedicated amateur astronomers and all that that implies: exclusive Member Star Parties, access to the Patterson Observatory and a ready source of observing and astro-photography expertise is just the tip of the iceberg.

Stay informed …

… to get the most out of your club. The calendar, announcements, schedule changes, local equipment sale offers, observing opportunities and much more are available on the club's Yahoo group called Haclist. (If you are not a member of Haclist, you should be!) This is the place to share and enjoy observing reports, astro-photography, and news, ask and answer questions, and discuss astronomy and related sciences, telescopes and astronomy gear. It was made for you, our members, so don't miss out on it.

You can join Haclist by sending an email to haclist-subscribe@yahoogroups.com or ask Ted Forte or Bert Kelher to send you an electronic invitation to join.

At the July Meeting

We have two guest speakers who will team up to relate the history and describe the current projects of the Fred Lawrence Whipple Observatory on Mt. Hopkins.

Dr. Emilio Falco, PhD MIT has been an Astronomer with SAO since 1989 and Project Director at FL Whipple Observatory since 2000. He works on several projects including the installation and use of new telescopes dedicated to the study of extrasolar planets. He directs operations at all the Ridge telescopes.

Some of the projects Dr. Falco is currently working on include gravitational lensing studies in several areas, from microlensing to quasar strong lensing to weak cluster lensing. Currently, he is pursuing multi-wavelength analyses of gravitational lens systems using Magellan/MMIRS infrared spectra of lensed quasars.

Closer to earth, Dr. Falco works with several groups in the installation and use of new telescopes dedicated to the study of extrasolar planets. MEarth and HATs are examples that have been very successful in finding extrasolar planets and other transient phenomena. The latest addition is MINERVA (MINiature Exoplanet Radial Velocity Array), with four 0.7m telescopes and MINERVA Red with a single 0.7m telescope. The project, that has as a goal the discovery of Earth-like planets in the habitable zone of their stars, started operations in 2015.

Alexandra Terry recently came on-board as the Public Relations Specialist at FLWO in March 2017. She has served in various capacities for Southern Arizona tribes for 16 years including Public Information Office and Chief of Staff for the Chairman of the Tonono O'odham Nation, most recently as Deputy Director of Housing for TON. Ms. Terry graduated with a BA in International Relations, Economic Development from Brown University and MBA from University of Arizona.

The meeting will begin at 7 pm on July 14 in the Student Union building at Cochise College, 901 N. Colombo Avenue, Sierra Vista. The meeting is open to the public and admission is free.

This article is provided by NASA Space Place.

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Space Place Article **June 2017**

The Shape of the Solar System

By Marcus Woo

When Stamatios (Tom) Krimigis was selected for the Voyager mission in 1971, he became the team's youngest principal investigator of an instrument, responsible for the Low Energy Charged Particles (LECP) instrument. It would measure the ions coursing around and between the planets, as well as those beyond. Little did he know, though, that more than 40 years later, both Voyager 1 and 2 still would be speeding through space, continuing to literally reshape our view of the solar system.

The solar system is enclosed in a vast bubble, carved out by the solar wind blowing against the gas of the interstellar medium. For more than half a century, scientists thought that as the sun moved through the galaxy, the interstellar medium would push back on the heliosphere, elongating the bubble and giving it a pointy, comet-like tail similar to the magnetospheres—bubbles formed by magnetic fields—surrounding Earth and most of the other planets

"We in the heliophysics community have lived with this picture for 55 years," said Krimigis, of The Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland. "And we did that because we didn't have any data. It was all theory."

But now, he and his colleagues have the data. New measurements from Voyager and the Cassini spacecraft suggest that the bubble isn't pointy after all. It's spherical.

Their analysis relies on measuring high-speed particles from the heliosphere boundary. There, the heated ions from the solar wind can strike neutral atoms coming from the interstellar medium and snatch away an electron. Those ions become neutral atoms, and ricochet back toward the sun and the planets, uninhibited by the interplanetary magnetic field.

Voyager is now at the edge of the heliosphere, where its LECP instrument can detect those solar-wind ions. The researchers found that the number of measured ions rise and fall with increased and decreased solar activity, matching the 11-year solar cycle, showing that the particles are indeed originating from the sun.

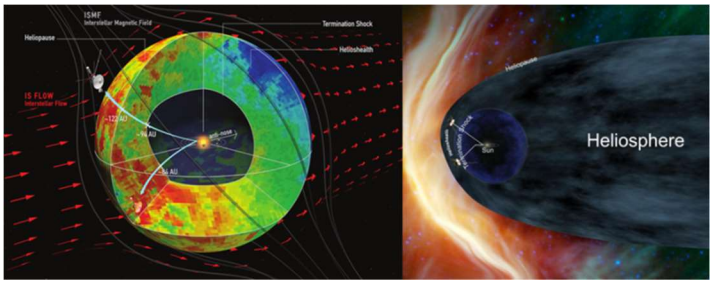
Meanwhile, Cassini, which launched 20 years after Voyager in 1997, has been measuring those neutral atoms bouncing back, using another instrument led by Krimigis, the Magnetosphere Imaging Instrument (MIMI). Between 2003 and 2014, the number of measured atoms soared and dropped in the same way as the ions, revealing that the latter begat the former. The neutral atoms must therefore come from the edge of the heliosphere.

If the heliosphere were comet-shaped, atoms from the tail would take longer to arrive at MIMI than those from the head. But the measurements from MIMI, which can detect incoming atoms from all directions, were the same everywhere. This suggests the distance to the heliosphere is the same every which way. The heliosphere, then, must be round, upending most scientists' prior assumptions.

It's a discovery more than four decades in the making. As Cassini ends its mission this year, the Voyager spacecraft will continue blazing through interstellar space, their remarkable longevity having been essential for revealing the heliosphere's shape.

"Without them," Krimigis says, "we wouldn't be able to do any of this."

To teach kids about the Voyager mission, visit the NASA Space Place: https://spaceplace.nasa.gov/voyager-to-planets



Caption: New data from NASA's Cassini and Voyager show that the heliosphere — the bubble of the sun's magnetic influence that surrounds the solar system — may be much more compact and rounded than previously thought. The image on the left shows a compact model of the heliosphere, supported by this latest data, while the image on the right shows an alternate model with an extended tail. The main difference is the new model's lack of a trailing, comet-like tail on one side of the heliosphere. This tail is shown in the old model in light blue.

Image credits: Dialynas, et al. (left); NASA (right)

What takes little time, little effort, and reaps enormous rewards?

The answer is I don't know. However, if you have a little time and can expend a little effort every month for HAC, we need officers. Both Vice President and Secretary Positions are currently vacant, and we need warm bodies to fill them. This really is a wonderful opportunity to see if you would like to be a board member, as you will only need to fulfil the obligations of the office until the November elections. Perhaps by then you'll be hooked on the absolute power of the office and want to continue, who knows.

It really doesn't take much time.

Board meetings only take place two or so times a year. Most discussion and decisions take place through email.

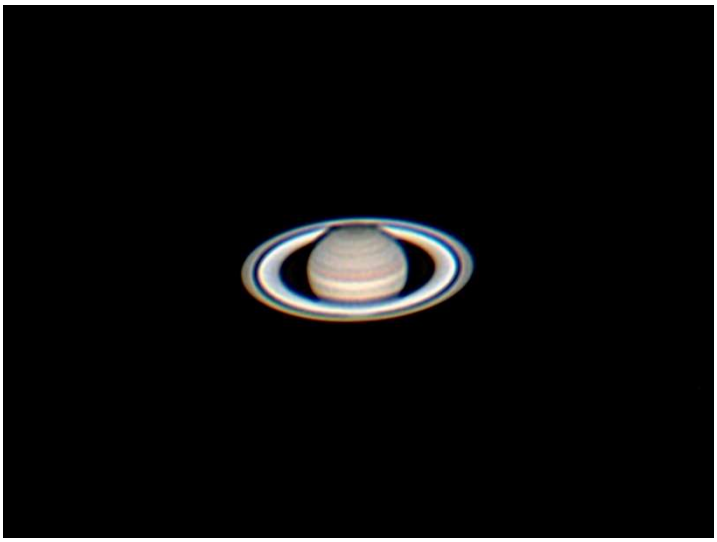
If you like this club, and want to keep liking it, become a member of the board. If you like this club, and have ideas to make it even better, become a member of the board. All you have to do is email one of the present board members, or talk to us at the next meeting to get the ball rolling.

Pictures from HAC Members

M33 Triangulum Galaxy by Jay LeBlanc

DWB 111 Propeller Nebula by Jay LeBlanc

Saturn by Mike J. Shade



NGC 4351 by David Roemer

NGC 6058 by David Roemer

WANT ADS

FOR SALE: MEADE EXT60AT NEVER USED BEFORE, INCLUDES TRI-POD.

Asking $200.00 B/O
Contact Keith Mullen at 266-4230

FOR SALE: MEADE 10" LX200 CLASSIC TELESCOPE

In very good condition, with tripod, 120v AC and 12v DC power converters with 25' power cords, dew shield, 8x50 finder scope, electric focuser, piggy back bracket, and soft sided carrying case. Also includes a set of Meade CCD color filters, Meade CCD 3.3 focal reducer and CCD variable T-adapter. Plus some other equipment. Asking $ 1,800.

Contact Bob Stroxtile at strox@ssvecnet.com or call 520-249-0875.

FOR SALE: PIER TECH ELECTRIC TELESCOPING PIER WITH LATI-WEDGE MADE FOR THE LATITUDE OF SIERRA VISTA

All the hardware, bolts, nuts, washers and plates are with the pier. Pier Tech can make new legs for it to make it correct for anywhere in the world. The pier and wedge have never been used and the only time the pier was out of the box was to take the photos. New today, the pier and wedge are $3,400. Asking $2,800.

Contact Bob Stroxtile at strox@ssvecnet.com or call 520-249-0875.

FOR SALE: MEADE STARFINDER 8" REFLECTOR TELESCOPE

Will Sell at a very reasonable price. Included are a Telrad Finder, Filters, and additional Lenses.

Contact Mr. Jim Moses at (520) 803-0913 or by email jjmoses2@gmail.com

FOR SALE: PLANEWAVE CDK14 CORRECTED DALL-KIRKHAM TELESCOPE.

Includes the OTA, new November 2014, optional truss rod shroud and optional upper dovetail and the accessories that were included with the telescope (primary to secondary spacing tool). There is NO FOCUSER (they do not come with one, you need to add one) but the adapter for an Optec TCFS3i (which is the focuser I used) is included. I also have the factory wooden shipping crate. The telescope has been in use every clear night in the observatory in Sonoita. This is an outstanding instrument and a great imaging scope.

FOR SALE: CELESTRON CELESTAR 8 INCH S/C DELUXE - $1200.

Will also sell pieces individually

Contact Rhonda and Terry Taylor at (520) 366-2378 or by email at twrl2@yahoo.com. Or See Craigslist at http://sierravista.craigslist.org/bar/4523742100.html

FOR SALE: OLDER OPTICAL GUIDANCE SYSTEMS 12.5" F/9 RITCHEY-CHRETIAN TELESCOPE.

Very good Paul Jones ceramic optics, Robofocus secondary focuser, will include Takahashi collimating telescope. Some of the images through the scope are at Mshadephotography.com.

Contact Mike J. Shade at mshade@q.com

FOR SALE: 8" CELESTRON NEX STAR

Good condition with all original accessories.

Contact Mae Childs at maechilds2014@aol.com

CLUB OFFICERS AND CONTACTS

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For more information on products and contact information, their websites are:

Farpoint Astronomy	http://www.farpointastro.com/
Starizona	http://starizona.com/

HAC Jul/Aug Calendar of Events

SU	MO	TU	WE	TH	FR	SA
9 12:07am	**10** Pluto Opposition	**11**	**12**	**13**	**14** HAC Meeting Student Union	**15**
16 3:26pm	**17**	**18**	**19**	**20** Venus 3° N of moon	**21**	**22**
23 5:46am	**24**	**25** Mercury 0.9° S of moon	**26**	**27**	**28** Jupiter 3° S of moon	**29** Delta Aquariid Meteors
30 11:23am Delta Aquariid Meteors	**31** Delta Aquariid Meteors	**1 Aug**	**2**	**3** Saturn 3° S. of Moon	**4**	**5**
6	**7** 2:11pm	**8**	**9**	**10**	**11** HAC Meeting Student Union Perseid Meteors	**12** Perseid Meteors
13 Perseid Meteors	**14** 9:15 pm Perseid Meteors	**15**	**16** Aldebaran .4° S, of moon	**17**	**18**	**19**
20	**21** 2:30pm **Total solar eclipse**	**22**	**23**	**24**	**25** Jupiter 3° S. of Moon Saturn Stationary	**26**
27	**28**	**29** 4:13am	**30** Saturn 4° S. of Moon	**31**	**1 Sep**	**2**
3	**4** Labor Day	**5** Neptune at Opposition	**6** 3:03am	7 Patterson Public Night 7pm	**8** HAC Meeting Student Union	Huachuca Astronomy Club

All event times MST. Join Haclist to keep up to date with all of the Huachuca Astronomy Club events
Send an email to: haclist-subscribe@yahoogroups.com