



# Star Stuff

Ford Amateur Astronomy Club Newsletter

Volume 27, Number 6

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.

Continued on Page 2

## Presidents Article

By Liam Finn

### Total Solar Eclipse – 8/21/2017

With June just about over and July quickly approaching so is the time for the Solar Eclipse. Two months to go and still so much preparation to get done. There has been some discussion on eclipse planning and also about doing some pre-eclipse setups and testing especially for anyone thinking of taking pictures with a standard camera or telescope.

If you have not yet already booked accommodation then good luck finding anything, you may get lucky but expect opportunistic pricing at this late stage. If you have not already setup and tested your imaging equipment now is the time.

Tips for eclipse preparation:

- Lay a tarp out on your lawn or driveway or wherever you plan on doing the testing
- Assemble your equipment as you would plan to on the day of the eclipse. And ensure everything is tracking. Everything that needs a power supply on the day has it. Every filter, screw, bolt, cable, EP, diagonal, computer, table and any other accessories you need are there and functioning.
- Once tested disassemble your setup and lay it out on the tarp and make a checklist of everything on the tarp. This is your master checklist for what to bring.

Continued on Page 2

## Presidents Article

Continued from page 1

- Label each case 1 of 5, 2 of 5 etc. then pack your equipment into its case and updating your list with the case number beside each item on your checklist.
- Now you have a complete list of what you need and where it is. A week before you travel, recheck the content to ensure everything you have on the list is in the correct case and load them into your car including the TARP.
- Don't forget the other essentials such as clothes, food, money and gas for the car ☺

Whatever way you plan on observing the eclipse be that from your driveway here in Michigan or some other part of the US to be on the line of totality, plan to be at your observing location early. Get setup early. Bring solar eclipse glasses so you can observe as the event unfolds. If you are imaging, use the time before the eclipse starts to verify all is working and tracking perfectly, do the tweaks now as you don't want to miss the event.

If you are running into equipment issues and you are 5 mins from totality, give up as you really don't want to be playing with your camera, mount or scope this late in the game and it's too late to fix now.

The most important part is to look up and enjoy the show. Don't be watching your computer screen or camera screen, watch the sky as this is the greatest show, viewable from earth, that our solar system has to offer.

## Beginners Nights

Our next Beginners Night is Saturday July 1<sup>st</sup> at Spring Mill Pond in Island Lake State Recreational Area. We have been unlucky with the last two due to weather so lets hope that July will be a turning point for clear skies. Don't forget the Michigan state bird (Mosquito) is out and about in force so be prepared to deal with these swarms.

## The Shape of the Solar System

Continued from page 1

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.

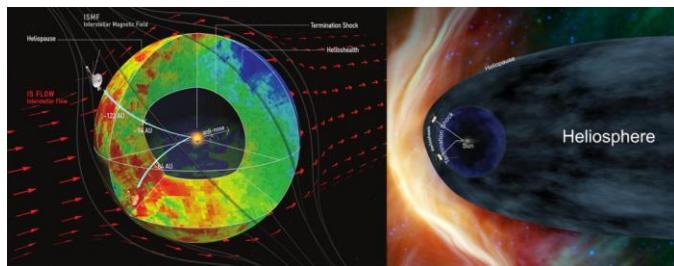
"Without them," Krimigis says, "we wouldn't be able to do any of this."

Continued on Page 3

## The Shape of the Solar System

Continued from page 2

To teach kids about the extreme conditions on Titan and other planets and moons, visit the NASA Space Place: <https://spaceplace.nasa.gov/planet-weather/>



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)

## Secretary's Report

By Jessica Edwards

Solar observing at West Middle School was a success with 200-300 kids getting views of the sun. Jupiter will have some good observing opportunities this month. Several shadow transits and the Great Red Spot will be visible. Saturn will be in opposition in 15 June and the rings be at their maximum extent. Comet C2015V2 can be seen in Boötes and is moving into Virgo as the month progresses.

## Main Talk – Inside Hidden Figures (Females Mathematicians in Early NASA History) – Jonathan Kade (WAS)

The stories of the Hidden Figures in NASA's history show that we can follow our dreams no matter the opposition. Even though they received little outside recognition or publicity, these women were respected for their contributions through their careers. Desegregating universities, calculating

trajectory and launch windows, and how to navigate via planets are just a few of the many accomplishments of these women.

## Astronomical League 2017-18 Dues

By Syed Saifullah

Astronomical League dues are due on June 30<sup>th</sup> of this year. Once again, they will be \$7.50 for the year. Joining the AL provides some nice benefits but most popular of all would probably be to complete the different observing programs and earning pins. You can read more about the observing programs here:

<https://www.astroleague.org/al/obsclubs/AlphabeticObservingClubs.html>

Personally, I enjoy the structure and goals the observing lists give me as I am working on multiple different observing programs at the moment. Also, the quarterly publications (The Reflector) are a good read. Please e-mail or get in touch with Syed Saifullah, the club ALCor (AL Coordinator) to pay your dues.

## Plymouth Astro Imaging SIG Events

By Gordon Hansen

All are welcome to attend. The meetings are at the Plymouth Library at 6 pm on the third Tuesday of each month. Reminders are published on the club's Yahoo Group.

## 2017 Beginner's Nights Calendar

Month	1st Quarter	Beginner's Night	Sunset	Location
April	Monday, April 3rd	<b>Saturday, April 1st</b>	7:58pm	Island Lake
April/May	Tuesday, May 2nd	<b>Saturday, April 29th</b>	8:30pm	Island Lake
		<b>^^Int'l Astronomy Day^^</b>		
June	Thursday, June 1st	<b>Saturday, June 3rd</b>	9:04pm	Island Lake
July	Friday, June 30th	<b>Saturday, July 1st</b>	9:12pm	Island Lake
July II	Sunday, July 30th	<b>Saturday, July 22th</b>	8:54pm	Island Lake (Club Picnic)
August	Tuesday, August 29th	<b>Saturday, August 26th</b>	8:15pm	Island Lake
<b>**Solar Eclipse is on 21st** - Head for totality!</b>				
September	Friday, September 9th	<b>Fri-Sat Sept 29, 30</b>	7:17pm 7:14pm	(AATB / Island Lake)
October	Sunday, October 27th	<b>Saturday, October 28th</b>	6:30pm	Maybury State Park

## Treasurers Report

May 2017

By Mike Bruno

<b>Ford Amateur Astronomy Club</b>		
<b>Balance Sheet</b>		
<b>6/20/2017</b>		
<b>ASSETS</b>		
<b>Checking / Savings</b>		
<b>Checking</b>	\$	352.99
<b>FAAC Savings</b>		
<i>General</i>		2,806.00
<i>Equipment</i>		2,376.87
<i>Scholarship</i>		158.26
<b>Total FAAC Savings</b>		5,341.13
<b>Petty Cash</b>		349.75
<b>Total CD's</b>		3,191.57
<b>Total Checking / Savings</b>		9,235.44
<b>TOTAL ASSETS</b>		\$ 9,235.44
<b>TOTAL EQUITY</b>		\$ 9,235.44
<b>INCOME</b>		
Membership Dues	\$	1,375.00
AL Dues	\$	37.50
Equipment Fund		75.00
Scholarship Fund		116.00
Merchandise		181.00
Club Events		2,591.63
Miscellaneous		100.00
Interest		3.25
<b>Total Income</b>		4,479.38
<b>EXPENSES</b>		
Merchandise		193.05
Scholarship		300.00
Club Events		2,736.19
Office expense		158.52
<b>Total Expenses</b>		3,387.76
<b>NET INCOME</b>		\$ 1,091.62

## FAAC Equipment Holders Report

By Dennis Salliotte

### FAAC Equipment Report 6/15/17

<u>Item</u>	<u>Currently Held By:</u>	<u>Date Last Verified</u>
<b><u>Telescopes</u></b>		
4" Dobsonian (Harold's donation)	George Korody	1/20/17
<b><u>Presentation Tools</u></b>		
Projector (older)	Jim Frisbie	1/15/17
Projection Screen 8'	Bob MacFarland	6/13/17
Speaker System w/wireless mic	Bob MacFarland	6/13/17
Bullhorn	George Korody	1/20/17
DVD Player	Jim Frisbie	1/15/17
Projection Screen 6'	Mike Dolsen	1/15/17
Projector, ViewSonic	Gordon Hansen	5/25/17
<b><u>Demonstration Tools</u></b>		
Weight On Planets Scale	George Korody	1/20/17
Lunar Phase Kit	Bob MacFarland	6/13/17
100 ft Scale Model Solar System Kit	Bob MacFarland	6/13/17
<b><u>Display Items</u></b>		
Astronomy Event Sign (3' X 6')	Gordon Hansen	1/16/17
PVC Display Board - Folding	Sandra Macika	1/23/17
Banner – Small (24" X 32")	George Korody	1/20/17
Banner – Medium (24" X 72")	Sandra Macika	1/23/17
Banner – Large (32" X 16')	George Korody	1/20/17
Tri-Fold Presentation Boards	Don Klaser	1/26/17
Tri-Fold Poster Board (Early Club Photos)	George Korody	5/25/17
<b><u>Other</u></b>		
Canopy (10' X 10')	Dennis Salliotte	6/15/17
Equipment Etching Tool	Greg Ozimek	4/20/17
Pop Cooler	Dennis Salliotte	6/15/17
<b><u>EQUIPMENT KITS</u></b>	<b><u>CARETAKER</u></b>	
<b><u>Telescopes</u></b>		
TK3 Celstrn 130 Newt Goto mount	Liam Finn	3/15/17

TK4 Clstrn 90 Refrctr w/man mount	Liam Finn	3/15/17
TK5 4 ½ “ Reflector, on Fitz GEM mount	Bob MacFarland	6/13/17
TK6 8" Orion 8XTi Dobsonian	Jed Datema CARETAKERSHIP IS AVAILABLE	3/29/17
TK1 Coronado PST solar scope w,double stack, Meade Autostar Goto mount & tripod and accessories	John McGill	1/15/17
TK7 TPO 8" f/4 Imaging Newtonian Telescope (OTA)	Jim Barnes	1/16/17
<b><u>Binoculars</u></b>		
BK3 15x70 binocs, monopod mount	Bob MacFarland	6/13/17
BK4 20x80 binocs,altaz goto mount	Sandra Macika	1/23/17
BK5 25x70 binocs w/tripod adaptor	Tim Dey	4/20/17
<b><u>Eyepiece Kit</u></b>		
EPK1 Eyepieces, filters & accesories	Liam Finn	3/15/17
<b><u>Other</u></b>		
TA Sky Quality Meter	Syed Saifullah	1/18/17
TA Sky Atlas 2000.0	Tim Dey	4/20/17
TA Orion telescope binoviewer	Liam Finn	3/15/17
<b><u>Lincoln Park Observatory</u></b>		
LPO Celestron binoviewer #93691	Tim Dey	4/20/17
LPO Celestron 2X 1.25" Barlow	Tim Dey	4/20/17
<b><u>Imaging SIG</u></b>		
C1 Celestron NexImage Solar System Imager model #93712	Gordon Hansen	4/20/17
C2 Meade Deep Sky Imager PRO III w/AutoStar Suite	Gordon Hansen	4/20/17
C3 Orion StarShoot Deep Space Video Camera NTSC #52185 w/video capture device #52178	Gordon Hansen	4/20/17
C4 Meade Electronic Eyepiece w/cable to a video monitor, VCR or TV. Pairw#43 AND Meade 3.5" LCD Color Monitor Kit # 07700 Complete (unused). Pair w#34	Gordon Hansen	4/20/17

C5 Orion StarShoot Deep Space Video Camera II #52195 AND Orion StarShoot iPhone Control for Deep Space Video Camera II #52195	Gordon Hansen	4/20/17
C6 Canon 60 DA and accessories	Tim Dey	4/20/17
CA1 Rigel Systems Spectroscope	Gordon Hansen	4/20/17
CA2 Celestron 1.25" to T-Adapter(male thread) Model #93625	Gordon Hansen	4/20/17
CA3 Canon EOS deluxe astrophoto kit FOR Canon bayonet T-thread adapter ans variable 1.25" extender	Gordon Hansen	4/20/17
CA4 Orion StarShoot LCD-DVR #58125 2.5" LCD screen	Gordon Hansen	4/20/17
CA5 Celestron Canon EOS T-ring adapter #93419	Gordon Hansen	4/20/17
<hr/>		
<b><u>Special Event Use Only- Not Available For Loan Out</u></b>		
<hr/>		
TK2 Meade 8" ETX-LS-ACF w/tripod, voice assist, computerized GPS plus MANY (35+) accessories	Tim Dey	4/20/17
BK1 Orion BT-100 binocular telescope w/hard case, Orion VersaGo h.d. man altaz mount w/Vixen dovetail head and Vixen style binocular holder bracket	Ken Anderson	4/20/17
BK2 Zhumell 25x100 binoculars, hard case & Zhumell TRH-16 tripod w/soft fabric bag	Sandra Macika	1/23/17
TAK1 Night Vision Intensification binocular unit	George Korody	1/20/17
<hr/>		
Dennis Salliotte equipment@fordastronomyclub.com		
<hr/>		

## **STAR STUFF**

This Newsletter is published eleven times each year by:  
FORD AMATEUR ASTRONOMY CLUB P.O. Box 7527 Dearborn MI 48121-7527

PRESIDENT: Liam Finn

VICE PRESIDENT: Tim Dey

SECRETARY: Jessica Edwards

TREASURER: Mike Bruno

WEBMASTER: Greg Ozimek

NEWSLETTER EDITOR: Syed Saifullah

### **Club Information:**

The Ford Amateur Astronomy Club (FAAC) meets on the fourth Thursday each month, except for the combined November/ December meeting on the first Thursday of December - at Henry Ford College Administration Services and Conference Center in Dearborn. Refer to our website for a map and directions. [www.fordastronomyclub.com](http://www.fordastronomyclub.com)

The FAAC observes at Spring Mill Pond within the Island Lake State Recreation Area near Brighton, Michigan. The club maintains an after-hours permit and observes on Friday and Saturday nights, and nights before holidays, weather permitting.

The FAAC also has use of a private observing site near Gregory Michigan and Lake Erie Metro Park. See the FAAC Yahoo Group\* for more information.

Observing schedules and additional info are available on our website, or via the FAAC Yahoo Group.\* Or call the FAAC Hotline, for info and leave a message, or ask questions: 313-757-2582. You may also send email inquiries to [info@fordastronomyclub.com](mailto:info@fordastronomyclub.com) .

Membership in the FAAC is open to anyone with an interest in amateur astronomy. The FAAC is an affiliate of the Ford Employees Recreation Association (F.E.R.A.).

### **Membership fees:**

Annual - New Members: \$30 (\$15 after July 1)

Annual - Renewal: \$25 (\$30 after January 31)

Membership includes the STAR STUFF newsletter, discounts on magazines, discounts at selected area equipment retailers, and after-hours access to the Island Lake observing site.

Astronomy or Sky & Telescope Magazine Discounts Obtain the required form from the FAAC club treasurer for a \$10 discount.

Send the completed form directly to the respective publisher with your subscriptions request and payment. Do not send any money directly to the FAAC for this.

Star Stuff Newsletter Submissions Your submissions to STAR STUFF are welcome! Send your story and/or images to the editor: [StarStuff@fordastronomyclub.com](mailto:StarStuff@fordastronomyclub.com) Email text or MS Word is fine. STAR STUFF will usually go to press the weekend prior to each general meeting.

Submissions received prior to the 15th can be included in that month's issue.

\* FAAC Members are welcome to join our Ford Astronomy Club Yahoo! Group. Messages photos, files, online discussions.