ASTRONOMY CLUB OF AKRON
www.acaoh.org

The Night Sky

The Newsletter of
The Astronomy Club of Akron
www.acaoh.org

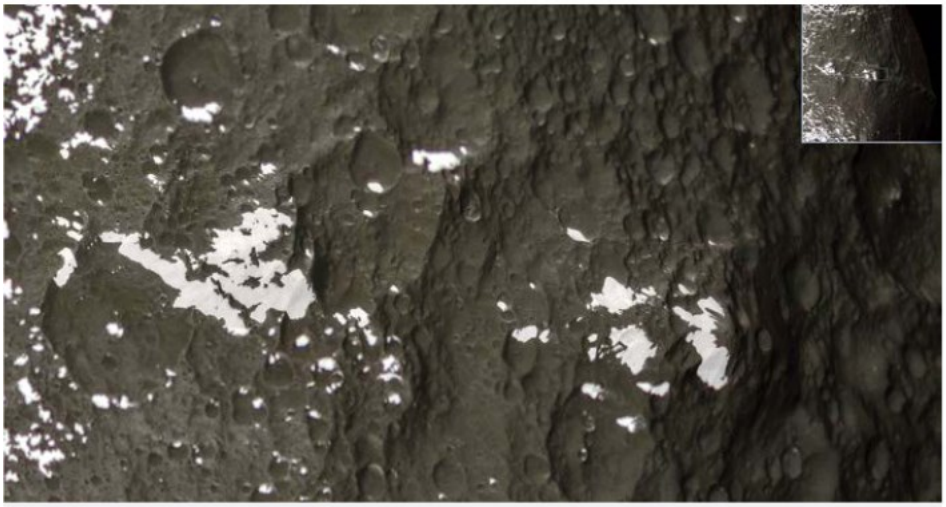
Volume 43 Number 1 **January 2021**

ACA ZOOM MEETING - January 22, 2021 AT 7:30PM

President's Column

By Gregg Crenshaw

THE TWO SIDES OF IAPETUS

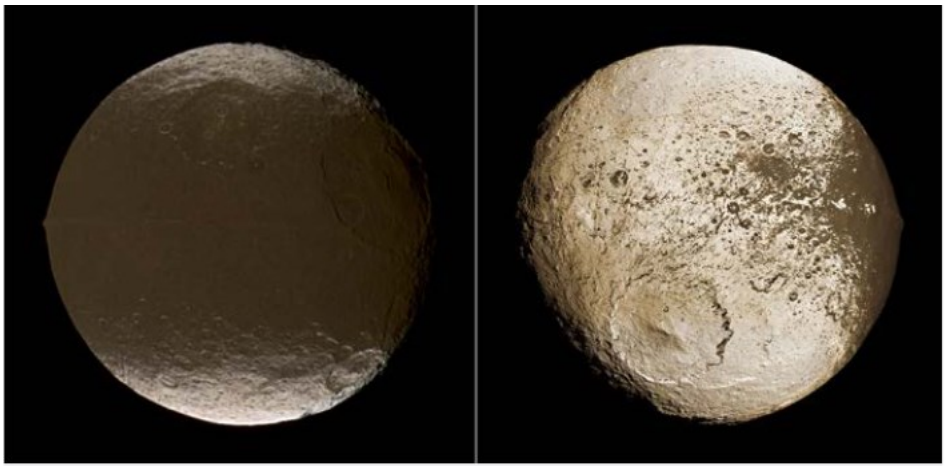


The Voyager 2 spacecraft took low-resolution images of Iapetus showing a line of white spots extending from the bright hemisphere onto the dark hemisphere. The images were not very detailed, and it was presumed the bright spots were the peaks of a mountain range, dubbed the Voyager Mountains.

In 1671, Italian-born French astronomer Giovanni Domenico Cassini was perplexed by his observations of one of Saturn's moons. He had discovered it in October 1671 to the west of Saturn and he tried to observe it again as it orbited to the east side of Saturn. He was unable to find it on the east side, but the next year he found it on the west side again. Thirty-four years later, using an improved telescope, he was able to find the disappearing moon on the east side, discovering that it was two magnitudes fainter on the east side than on the west side. Cassini realized that, like our own Moon, Iapetus was tidally locked to Saturn, keeping the same face toward the planet at all times. This made the trailing hemisphere of the moon visible to the Earth on the west side of Saturn as it moved away from us and the leading hemisphere visible on the east side of Saturn as it moved toward us. The apparent magnitude of the forward-facing side is around magnitude 11.9, while the trailing side is around magnitude 10.2. This makes the trailing hemisphere an incredible five times brighter than the leading hemisphere. The color of the two hemispheres is also different. The bright hemisphere is white, reflecting just over half of the sunlight that falls on it. The dark side is slightly-reddish brown, reflecting only about four percent of the sunlight. This extreme contrast is unique in our Solar System. While Earth-based astronomers could see the difference in brightness, Iapetus's 914-mile diameter results in a 0.2 arcsecond diameter image, revealing no detail on the surface of this moon. Although astronomers could not see surface details, they could take spectrograms of the two hemispheres. The leading, darker hemisphere appears to be carbonaceous, with darker compounds of carbon, hydrogen, and nitrogen frozen solid at the surface temperature of around –226°F. The bright side shows characteristics of water ice, which reflects more of the Sun's heat back into space resulting in a colder temperature of –280°F.

The Saturnian moons are named after the Titans of Greek mythology, as suggested by John Herschel in 1847. The Titans were siblings of Cronus, another Titan, whom the Romans called Saturn. The names of geological features on Iapetus are taken from the French epic poem "The Song of Roland." These include the northern region of the bright hemisphere, Roncevaux Terra, as well as the craters Charlemagne and Baligant. The dark region, Cassini Regio, is an

exception to this rule, being named after the moon's discoverer. The bright region is split into two sections. Roncevaux Terra is the northern half of the bright region, and Saragossa Terra is the southern half. Saragossa Terra has a very prominent basin 313 miles across named Engelier. This basin was probably the result of a small asteroid impacting the moon. There are two larger craters on Iapetus, but they are both older and more eroded by more recent impacts. Abisme in northern Cassini Regio is 476 miles across, and Turgis, on the equator at the edge of Cassini Regio, is 360 miles across. To learn more about Iapetus, spacecraft needed to visit the Saturnian system. Pioneer 11 provided the first glimpse of Iapetus in 1979, but the moon was too far away to get images useful in solving its mystery. In 1980, Voyager 1 was targeted to fly by Saturn's moon Titan, so it was too far from Iapetus to get close-up images. Voyager 2 in 1981 got better images that clearly showed craters on the surface. Finally, in July 2004, the Cassini spacecraft entered orbit around Saturn and was able to get close-up images of Saturn's moons, including Iapetus. It made its closest approach to the moon on September 10, 2007.The Cassini spacecraft revealed a surface that was heavily cratered. This indicates that the surface is very old and unaltered by geological processes. They also indicated that the moon was not spherical. It is an oblate spheroid, a squished sphere with a polar diameter five percent smaller than its equatorial diameter. This would be normal if Iapetus was making a revolution every 16 hours, instead of every 79 days. This oddity can occur if the crust became frozen in its current shape while the moon continued to slow its rotation until it became tidally locked. The bulging equator has an additional feature, a ridge of individual mountains, mountain ranges, and parallel ridges. Some of the mountains are over 12 miles high, some of the highest mountains in the Solar System. These two factors give Iapetus a walnut-shaped appearance. It is the largest object in the Solar System not in hydrostatic equilibrium. The equatorial ridge is most prominent in the dark hemisphere where it is well delineated. In the bright area, the ridge almost completely disappears, but there are single mountain peaks over six miles high scattered along the equator in that hemisphere. The ridge is interrupted by craters, indicating that it is as old as the rest of Iapetus's surface. The source of the ridge is poorly understood, but it may be related to the moon's non-spherical shape. Voyager 2 imaged a line of white spots near the equator as it enters the dark region. These were initially thought to be mountain peaks towering above the dark material. Dubbed the "Voyager Mountains," they were not exactly on the equator, but slightly offset. Cassini images showed that the bright spots are not on the peaks, but on the sides of mountains, forming one of many examples where bright material exists in the dark region and vice versa.



The two hemispheres of Iapetus, the dark and bright. The dark hemisphere is the leading hemisphere, always facing the direction of motion, since the moon is tidally locked to Saturn.

Iapetus has a very low specific gravity, around 1.08, just slightly higher than that of water. This implies that Iapetus is mostly frozen water, with a small amount of rocky material mixed in. The bright areas are most likely ice, accounting for their high reflectivity. The dark material is only about a foot thick, since small meteorites can punch through it to the underlying brighter ice. It is likely that the dark material had been mixed in with the ice and it was left behind as sunlight sublimated the ice. The dark region absorbs more sunlight and loses more ice, leaving more dark material behind, while the light areas lose much less ice and stay white. Over a billion years, the dark areas lost 70 feet of ice while the light areas only lost 4 inches. The dark area on the front side on Iapetus probably started getting dark by accumulating material blown off the outer small moons, especially Phoebe, that spiraled down toward Saturn and was swept up by Iapetus's leading hemisphere. Ultraviolet light from the Sun darkened this material. Once enough material had accumulated, the process of sublimating ice would continue without accumulating any additional material. Iapetus is one of the most bizarre moons in the Solar System. Its striking albedo contrast along with the equatorial ridge and lack of hydrostatic equilibrium makes Iapetus a true moon of mystery.

Taken from the September 2020 Astronomical League publication "REFLECTOR"
by Berton Stevens

Article by Gregg Crenshaw
ACA President

January Astronomical Events

Day Hour (UT)
01 02 Moon-Beehive 02:05
01 00 Venus 20.2° W
02 03 Perihelion 03:59
03 09 Quadrantids 09:47
06 04 Last Quarter 04:37
09 10 Moon Perigee 10:39
10 15 Moon D Node 15:14
11 15 Moon-Venus 15:11
12 03 Moon S Dec 03:18
13 00 New Moon 00:00
20 16 First Quarter 16:02
21 08 Moon Apogee 08:11
23 20 Mercury East 20:59
23 21 Saturn Sun 21:26
24 16 Moon A Node 16:47
26 10 Moon N Dec 10:39
28 09 Moon-Beehive 09:50
28 14 Full Moon 14:16
28 19 Jupiter Sun 19:51

Sky Events Calendar by Fred Espenak and Sumit Dutta (NASA's GSFC)

February Astronomical Events

Day Hour (UT)
01 00 Venus 13° W
03 14 Moon Perigee 14:33
04 12 Last Quarter 12:37
06 19 Moon D Node 19:29
08 08 Mercury Infer 08:39
08 10 Moon S Dec 10:34
11 14 New Moon 14:06
18 05 Moon Apogee 05:22
18 17 Moon-Mars 17:47
19 13 First Quarter 13:47
20 20 Moon A Node 20:44
22 19 Moon N Dec 19:12
23 02 Mercury-Sat 02:38
24 19 Moon-Beehive 19:16
27 03 Full Moon 03:17

Sky Events Calendar by Fred Espenak and Sumit Dutta (NASA's GSFC)

General Membership Meeting

Topic: ACA Monthly Meeting.
Time: Jan 22, 2021 07:30 PM Eastern Time (US and Canada).
Join Zoom Meeting: https://zoom.us/j/97179961865?pwd=dDFvVjhwYm1lWmNGUlJJZjVUVUhtUT09

Meeting ID: 971 7996 1865
Passcode: 763204

One tap mobile:
+13126266799,,97179961865#,,,,*763204# US (Chicago)
+19292056099,,97179961865#,,,,*763204# US (New York)
Dial by your location
+1 312 626 6799 US (Chicago)
+1 929 205 6099 US (New York)
+1 301 715 8592 US (Washington D.C)
+1 346 248 7799 US (Houston)
+1 669 900 6833 US (San Jose)
+1 253 215 8782 US (Tacoma)

Meeting ID: 971 7996 1865
Passcode: 763204
Find your local number: https://zoom.us/u/acK51R3t6z

Additionally the ACA is looking for a member to take on putting together the newsletter. Marissa's health has caused her to stop doing the newsletter. She will help train someone to do this important function. If you are interested email Gregg Crenshaw at president@acaoh.org or mars3c273@gmail.com or Marissa Fanady at speedymissy@yahoo.com.

Clear Skies,
Gregg Crenshaw
President, Astronomy Club of Akron
Astronomical League Correspondent

20+ years in SPACE!!!!

By Marnie Sanders

As most space nerds know, the launch for Crew 1 went well last month to a now 20+ year old ISS! The Crew Dragon, named "Resilience" delivered Michael Hopkins, Victor Glover, and Shannon Walker of NASA and Soichi Noguchi of JAXA, the Japanese Aerospace Exploration Agency. Note: this was the FIRST multicultural "Star Trek" type crew ever launched.....YAY!!!! AND....It was the first launch to the ISS by a U.S. commercial spacecraft! (You can get all the info on this launch at NASA.gov.)

I was just fascinated that we had all been watching this outer space outpost for 20 years!! I know just how often we all stood quietly watching the ISS cross the night sky above us when we gathered at our ACA Observatory! It fired our imaginations and wonder as we paused there, enjoying the night sky and our companionship! I can't wait to go there again!!

In the meantime, ...here excerpts of a bit of history on the ISS from my favorite newsletter EarthSky.org (from an article posted by Lia Rovera in HUMAN/WORLD/SPACE, November 09, 2020):

"It was 20 years ago that astronaut William “Bill” Shepherd and cosmonauts Yuri Gidzenko and Sergei Krikalev became the first people to step aboard the International Space Station (ISS). That first crew resided onboard the station for several months. Since then, ISS has been continuously inhabited for more than two decades, growing from a small residence to a sprawling collection of laboratory modules, research platforms and crew living quarters. ISS has provided a platform for living and working for hundreds of men and women from countries around the world.
ISS is a collaboration between the United States, Russia, Canada, Japan and the participating nations of the European Space Agency. Although the first piece of the ISS – a module named Zarya – reached orbit in 1998, it took another two years for the first permanent crew to arrive at the station on November 2, 2000.

For Bill Shepherd and the two cosmonauts who made up Expedition 1, entrance into the early station marked the beginning of an unprecedented era of peaceful cooperation in space, paving the way for spacemen and spacewomen to conduct science in the name of benefiting humankind. Work on the space station also supports space exploration for NASA’s Artemis program to land the first woman and next man on the moon in preparation to continue on to Mars.
Highlights of the space stations history include:

– The primary pieces of the space station were delivered on 42 assembly flights: 37 on U.S. space shuttles and five on Russian Proton/Soyuz rockets. Elements were constructed independent of one another around the globe and assembled for the first time in space.
– The space station took 11 years to fully construct. Its current configuration measures 357 feet (109 m) end to end with a mass of nearly 1 million pounds (roughly 454,000 kg). Elements of the space station are continually added and reconfigured.
– There have been 221 spacewalks for space station assembly, maintenance and upgrades.
– It took a collaborative effort by 15 nations to construct the space station in orbit, and that collaboration continues today. The principal space agencies are the United States’ NASA, Russia’s Roscomos, the European Space Agency, the Japan Aerospace Exploration Agency, and the Canadian Space Agency.
– 239 individuals from 19 countries have visited or enjoyed extended stays on the space station."

For more from this article, please go to: https://earthsky.org/space/20-years-iss-what-its-future-holds-nov-2-2020?utm_source=EarthSky+News&utm_campaign=428248ab72-EMAIL_CAMPAIGN_2018_02_02_COPY_01&utm_medium=email&utm_term=0_c643945d79-428248ab72-394210309

Article By ACA Member
Marnie Sanders

SWAP & SHOP

FOR SALE:

Orion Sirius 40mm Plossl

Asking: $25
Contact: Glenn Cameron
Phone: 330-737-1472
Email: glenn@cameronclan.org

FOR SALE:

Televiev Radian 12 mm Eyepiece

- Excellent condition.

Asking: $180 (cash)
Contact: Fred Fry
Email: riverfry@gmail.com

FOR SALE:

Televiev Radian 18 mm Eyepiece

- Excellent condition.

Asking: $180 (cash)
Contact: Fred Fry
Email: riverfry@gmail.com

FOR SALE:

Celestron CPC Deluxe 800 HD Telescope with tripod.
Accessories:

- Celestron 1.25" eyepiece and filter kit.
- Tele Vue nebula filter.
- Celestron UHC/LPR filter.
- Celestron 15mm 1.25" 82 degree wide field eyepiece.
- Stellarvue 1.25" Dielectric Diagonal.
- Stellarvue 1.25" erecting prism.
- Celestron power tank and dew shield.
- Astrozap sun filter.
- Celestron AC adapter.
- JMI custom hard shell case for telescope.

All 8 months old, brand new condition.

Asking: $2200
Contact: Jim Hall
Phone: 330-268-8695

FOR SALE:

Pentax XW 20mm Eyepiece

- Excellent condition.
- Small mark on 1.25” barrel.
- Always used in a compression clamp.

Asking: $220 (cash)
Contact: Fred Fry
Email: riverfry@gmail.com

FOR SALE:

Celestron NexStar 8i computerized to go 8" F/10 Schmidt-Cassegrain
Focal length 2032 mm with 406x highest useful power.
Includes:

- GPS module.
- Five multicoated Plössl eyepieces.
- 2X Barlow lense.
- Seven filters.
- A/C adaptor.
- Night vision flash.
- Celestron star pointer.

All rarely used and in new condition. Cost $1,689 new.

Asking: Best Offer
Contact: Nick Bade
Email: nb@tribco.com
Phone: 216-486-2000 weekdays and 440-585-8687 evenings and weekends.

Advertise in the Swap n Shop!

Send a picture of your ASTRONOMY RELATED item and relevant information to the newsletter editor:

mfanady@yahoo.com

OFFICERS 2020 – 2022

President
Gregg Crenshaw
Phone: **E-mail:** mars3c273@gmail.com

Vice President
Glenn Cameron
Phone: **E-mail:**

Treasurer
Dave Hartsook
Phone: **E-mail:**

Secretary
Gary Smith
Phone: **E-mail:**

Assistant Secretary/Treasurer
Jim Swift
Phone: **E-mail:**

Observatory Director
Ron Kalinoski
Phone: 330-837-5848

ACA Webmaster
Dave Jessie
Phone: 330-688-9043 **E-mail:** DJessie@neo.rr.com

Publications Secretary - Editor, Night Sky Newsletter
Marissa Fanady
Phone: 330-531-2443 **E-mail:** mfanady@yahoo.com

Trustee

E-mail:

Trustee
Susan Swift
E-mail: swiftsm@windstream.net

Trustee
Connie Tighe
E-mail: contighe@hotmail.com

Statutory Agent
Mark Kochheiser
Phone: **E-mail:**

OTAA Representative
Lou Poda

November Treasurer's Report

By Dave Hartsook

11/1/2020 Through 11/30/2020

Checking Beginning Balance	**$2,475.35**
Income	
Membership Dues Collected (2 Adult 3 Family)	180.00
Net Paypal Fee/Adj	0.25
Total Income	**$180.25**
Expenses	
Zoom Pro 1 Year Membership for Virtual Club Meetings	-159.64
Total Expenses	**-$159.64**
Income Less Expenses	**$20.61**
Checking Ending Balance	**$2,495.96**
Savings Beginning Balance	**$2,567.92**
Earned Interest	0.02
Savings Ending Balance	**$2,567.94**
Petty Cash Beginning Balance	**$50.00**
	0.00
Petty Cash Ending Balance	**$50.00**
Petty Cash	50.00
Savings	2,567.94
Checking	2,495.96
Grand Total	**$5,113.90**

Article by Dave Hartsook
ACA Treasurer.

OFFICERS 2020 – 2022

President
Gregg Crenshaw
Phone: **E-mail:** mars3c273@gmail.com

Vice President
Glenn Cameron
Phone: **E-mail:**

Treasurer
Dave Hartsook
Phone: **E-mail:**

Secretary
Gary Smith
Phone: **E-mail:**

Assistant Secretary/Treasurer
Jim Swift
Phone: **E-mail:**

Observatory Director
Ron Kalinoski
Phone: 330-837-5848

ACA Webmaster
Dave Jessie
Phone: 330-688-9043 **E-mail:** DJessie@neo.rr.com

Publications Secretary - Editor, Night Sky Newsletter
Marissa Fanady
Phone: 330-531-2443 **E-mail:** mfanady@yahoo.com

Trustee

E-mail:

Trustee
Susan Swift
E-mail: swiftsm@windstream.net

Trustee
Connie Tighe
E-mail: contighe@hotmail.com

Statutory Agent
Mark Kochheiser
Phone: **E-mail:**

OTAA Representative
Lou Poda

December Treasurer's Report

By Dave Hartsook

12/1/2020 Through 12/31/2020

Checking Beginning Balance	**$2,495.96**
Income	
Membership Dues Collected (2 Adult 1 Family)	100.00
Net Paypal Fee/Adj	0.18
Total Income	**$100.18**
Expenses	
Total Expenses	**-$0.00**
Income Less Expenses	**$100.18**
Checking Ending Balance	**$2,596.14**
Savings Beginning Balance	**$2,567.94**
Earned Interest	0.02
Savings Ending Balance	**$2,567.96**
Petty Cash Beginning Balance	**$50.00**
	0.00
Petty Cash Ending Balance	**$50.00**
Petty Cash	50.00
Savings	2,567.96
Checking	2,596.14
Grand Total	**$5,214.10**

Article by Dave Hartsook
ACA Treasurer.

The Night Sky
Newsletter of the Astronomy Club of Akron
c/o Marissa Fanady, Editor
2993 Midway Ct.
Akron OH, 44319

The Astronomy Club of Akron
c/o Dave Hartsook
4174 Meadow Wood Lane
Uniontown, OH 44685-7717

Yes! I want to become a member of the Astronomy Club of Akron

Check one: ○ New Membership
○ Renewal

www.acaoh.org
(PLEASE PRINT)

Name: _____ Phone: _____

Address: _____

City: _____ State: _____ Zip: _____

Email Address: _____

Astronomy Club of Akron annual memberships renew in the month of September.
Initial dues for New Members are prorated. If joining in Sep-Nov, pay full amount below; Dec-Feb pay 75%; Mar-May pay 50%; Jun-Aug pay 25%

Adult (ages 18 and older) ○ $30.00
Additional Adult Member ○ $15.00
Junior (ages 12 to 17) ○ $15.00
Family Membership ○ $40.00

Visit us on the Web at www.acaoh.org