CONSTELLATION

the official publication of Bucks-Mont Astronomical Association, Inc

Vol 33, No 1 Winter 2018 Scott Petersen, editor

Super Blue Blood Moon

- by Antoine Pharamond

For those that don't know me, I am a former member and president of BMAA. I moved to Singapore 13 years ago. After a 10 year hiatus, I bought a scope again so I could show my daughters some of the wonders of the night sky. Singapore has the world's worst light pollution, and pretty humid, hazy skies. It takes a good night to see even the Orion Nebula. But the planets tend to pass straight overhead, and the seeing is generally pretty steady. I've seen Jupiter like I never thought I could. The Science Center holds weekly public star-watches, which I occasionally attend with my scope, and there is an astronomy community. Proper dark skies are about 2 hours away by car, in Malaysia.

The "Super Blue Blood Moon", as the media called it, was conveniently timed, with maximum eclipse occurring at 9:30p. But clear weather is far from guaranteed in Singapore. It was a stormy afternoon, and I had all but given up and almost forgotten about the eclipse. Just before 9:00p, however, it seemed like the clouds were thinning a bit, so I went out to check. And there it was. Actually, the rain had taken the normal humidity and haze from the sky. The transparency was unusual. I ran back up to get the family, camera, binocs and scope. We gathered by the pool (yes, pool, it's 80 degrees in the evenings, here, all year 'round). Luckily, the scope battery wasn't dead, despite the fact that I didn't charge it after my (successful) solar eclipse trip to the US last August. I'm sorry to say that was the last time I had the scope out . . .

A few other residents in the building joined to get a peak through the scope. Most people can't believe it's the moon they're looking at when they see it through the scope. I love impromptu star-watches... Anyway, by 10:00p, it was just me and the equipment, which consists of a Celestron Nextar 8 SCT and a Canon 80D. Those two, by the way, don't like each other very much. When I acquired the scope 3 years ago, the first thing I did was buy an adapter for my DSLR (not an 80D back then). Sadly, but not surprisingly I guess, the moon didn't fit on the APSC sensor. F6.3 reducer to the rescue . . . Or not. I tried the focal reducer. Sure the moon fit, but the darn thing put the sensor just out of reach of the focuser. This was partly due to the big 2" diagonal, which I want there for anti-vignetting reasons and easy swapping between camera and eyepiece. I eventually found a solution - to put the focal reducer AFTER the diagonal. It turns out the body of my DSO 2" diagonal uses a 2" SCT thread. The diagonal attaches directly to the scope. The FR goes into to back of the diagonal (2" eyepiece barrel removed). And the barrel goes on the back of the FR. The camera goes in the barrel. This results in an FOV of just over half a degree on an APSC (15mmx22mm) sensor, and it's focusable. Phew . . .

Which brings us back to 31 Jan 2018. Clear sky, functional scope and camera, and a once-in-a-lifetime, big, blue (not really), red moon! It turns out the seeing was quite good, too. I snapped a few dozen shots, playing with the focus, ISO and exposure. This one took the cake. ISO 1600, one second exposure, taken a few minutes before the end of the umbral eclipse. *[- see this photo on page four]*

Then the clouds rolled in again . . .

- Former BMAA member and past president Antoine Pharamond provided this article [-ed]

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Bucks-Mont Astronomical Association, Inc
General Meeting Minutes
November 1, 2017

Location: Upper Dublin Lutheran Church, 411 Susquehanna Road, Ambler PA 19002

Meeting called to order by Gary Sprague at 7:30p. In attendance: 21 members and guests

Officers: Gary Sprague (co-president), Dwight Duksky (co-president), Lee Zagar (vice-president), Ed Radomski (treasurer), Robert Mittel-Carey (secretary)

- October 20th Orionids – no one saw any activity
- Reviewed Nov – Dec calendar
  - 11/19 Newtown Theater Pecha Kucha (Dwight)
  - 11/17-18 Leonid peak; new moon
  - 11/21 Cub Scout event @ Jarretown Elementary School
  - 11/30 Star watch @ Council Rock South 7:00p
  - 12/6 Show and Tell meeting
- Area Events
  - 11/8 MontCo – Presidential Symposium: Dr Derrick Pitts lecture 12:30p- 2:30p
  - 11/13 MontCo – Community Night
- Video: YouTube Hubblecast: Hubble Uncovers Secrets of Ring Nebula
- Share Time
  - Igor: Astrophotography: Lagoon Nebula, M1, Orion Nebula, Packman Nebula, IC 2087, Perseus A (galaxy cluster), Blinking Planetary Nebula, M74, and NGC 7814
  - Dwight: Pecha Kucka slideshow

➢ **Main Topic: Bernie Kosher Ramblings**

Bernie discussed several topics such as constellation pronunciation, visual effects, etc.

Respectfully submitted,
Robert Mittel-Carey, secretary

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The CONSTELLATION is the official publication of the Bucks-Mont Astronomical Association, Inc, a 501(c)(3) non-profit organization incorporated in the Commonwealth of Pennsylvania and exists for the exchange of ideas, news, information and publicity among the BMAA membership, as well as the amateur astronomy community at large. The views expressed are not necessarily those of BMAA, but of the contributors and are edited to fit within the format and confines of the publication. Unsolicited articles relevant to astronomy are welcomed and may be submitted to the Editor. Reprints of articles, or complete issues of the CONSTELLATION, may be available by contacting the Editor at the address listed below, and portions may be reproduced with permission, providing proper acknowledgment is made and a copy of that publication is sent to the Editor. Contents of this publication, and format (hard copy or electronic) are copyright ©2018 BMAA, Inc. Submission deadline for articles is the 15th of the month prior to quarterly publication.

SCOTT PETERSEN
CONSTELLATION EDITOR
constellation@bma2.org
TEL: 215.598.8447

Bucks-Mont Astronomical Association, Inc

General Meeting Minutes
December 6, 2017

Location: Upper Dublin Lutheran Church, 411 Susquehanna Road, Ambler PA 19002
Meeting called to order by Gary Sprague at 7:30p. In attendance: 27 members and guests

Officers present: Gary Sprague and Dwight Dulsky (co-presidents), Lee Zagar (vice-president), Ed Radomski (treasurer), Robert Mittel-Carey (secretary)

- Franchesca gave a recap of Derick Pitts lecture at MontCo
- Calendar review:
  - Pecha Kucha night (11/30) with Dwight went well
  - 11/30 star watch postponed until spring 2018
  - Jan 3rd meeting: Holiday Pot Luck and Quiz night
  - Feb 7th meeting: Black Holes, Wormholes and Quantum Labyrinth
  - Mar 7th meeting: Radio Astronomy
  - Other planned meetings: 2 astrophotography, scopes – selection and operation, urban observing, supernovae
- 2017 star watches were overall a hit or miss with weather
- MontCo/Kelli Spangler - having ongoing issues with observatory, mostly computer related.
- Club business:
  - Treasurer's report: 2017 recap - all good/in the black
  - Election Committee 2018 Nominations:
    - Co-Presidents: Lee and Dwight
    - Vice-president: Gary
    - Secretary: Robert
    - Treasurer: Ed

➢ **Main Topic: Show & Tell**

We had some great astrophotography and related photos from Brad, Steve, Bob, Igor, and Gary, Terry had several books he offered for free to anyone interested.

Respectfully submitted,
Robert Mittel-Carey, secretary

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2018 BMAA officers

info@bma2.org

DwightDulsky, co-president
Lee Zagar, co-president
Gary Sprague, vice-president
Robert Mittel-Carey, secretary
Ed Radomski, treasurer

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Bucks-Mont Astronomical Association, Inc
General Meeting Minutes
January 3, 2018

Location: Upper Dublin Lutheran Church, 411 Susquehanna Road, Ambler PA 19002

Meeting called to order by Gary Sprague at 7:30p. In attendance: 18 members and guests

Officers present: Lee Zagar (co-president), Gary Sprague (vice-president), Robert Mittel-Carey (secretary)

- Howie and Gary reviewed the planned star watches and other calendar events for 2018

➢ **Main Topic: Quiz Night, Holiday Party / Pot Luck**
Gary had a very good presentation of questions related to space exploration, with some pop culture (ie Star Trek) thrown in for fun.

Respectfully submitted,
Robert Mittel-Carey, secretary

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- January Super Blue Blood Moon, image by Antoine Pharamond

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Space Place

November 2017

Studying Storms from the Sky

- by Teagan Wall

The United States had a rough hurricane season this year. Scientists collect information before and during hurricanes to understand the storms and help people stay safe. However, collecting information during a violent storm is very difficult.

Hurricanes are constantly changing. This means that we need a lot of really precise data about the storm. It's pretty hard to learn about hurricanes while inside the storm, and instruments on the ground can be broken by high winds and flooding. One solution is to study hurricanes from above. NASA and NOAA can use satellites to keep an eye on storms that are difficult to study on the ground.

In Puerto Rico, Hurricane Maria was so strong that it knocked out radar before it even hit land. Radar can be used to predict a storm's path and intensity—and without radar, it is difficult to tell how intense a storm will be. Luckily, scientists were able to use information from a weather satellite called GOES-16, short for Geostationary Operational Environmental Satellite – 16.

The "G" in GOES-16 stands for geostationary. This means that the satellite is always above the same place on the Earth, so during Hurricane Maria, it never lost sight of the storm. GOES-16's job as a weather satellite hasn't officially started yet, but it was collecting information and was able to help.

From 22,000 miles above Earth, GOES-16 watched Hurricane Maria, and kept scientists on the ground up to date. Knowing where a storm is—and what it's doing—can help keep people safe, and get help to the people that need it.

Hurricanes can also have a huge impact on the environment—even after they're gone. To learn about how Hurricane Irma affected the Florida coast, scientists used images from an environmental satellite called Suomi National Polar-orbiting Partnership, or Suomi-NPP. One of the instruments on this satellite, called VIIRS (Visible Infrared Imaging Radiometer Suite), took pictures of Florida before and after the Hurricane.

Hurricane Irma was so big and powerful, that it moved massive amounts of dirt, water and pollution. The information captured by VIIRS can tell scientists how and where these particles are moving in the water. This can help with recovery efforts, and help us design better ways to prepare for hurricanes in the future.

By using satellites like GOES-16 and Suomi-NPP to observe severe storms, researchers and experts stay up to date in a safe and fast way. The more we know about hurricanes, the more effectively we can protect people and the environment from them in the future.

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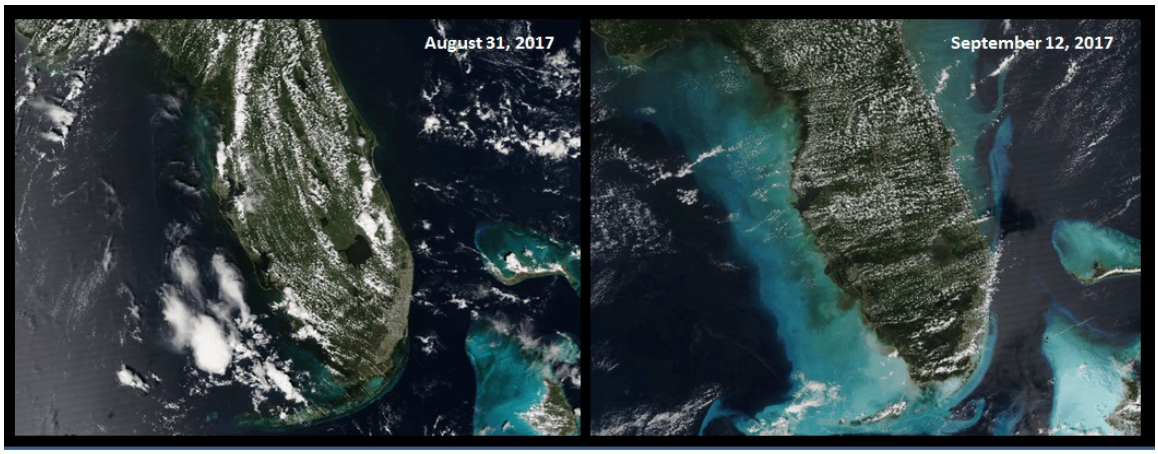
To learn more about hurricanes, check out NASA Space Place: https://spaceplace.nasa.gov/hurricanes/



Caption: These images of Florida and the Bahamas were captured by a satellite called Suomi-NPP. The image on the left was taken before Hurricane Irma and the image on the right was taken after the hurricane. The light color along the coast is dirt, sand and garbage brought up by the storm. Image credit: NASA/NOAA

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Editor's Note

The CONSTELLATION is your BMAA club newsletter and its success depends solely on your input. Please submit articles to me at: **constellation@bma2.org**. I am trying to maintain a quarterly publication cycle, on or about the Solstices and Equinoxes with supplements as required. Thanks.

- Scott Petersen, editor

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Space Place

December 2017

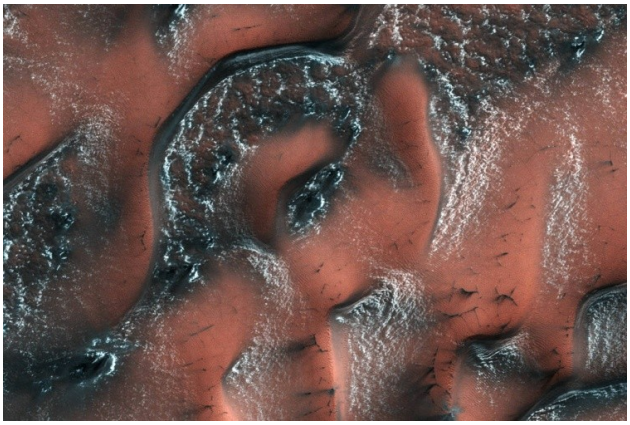
Snowy Worlds Beyond Earth

- by Linda Hermans-Killiam

There are many places on Earth where it snows, but did you know it snows on other worlds, too? Here are just a few of the places where you might find snow beyond Earth:

Mars

The north pole and south pole of Mars have ice caps that grow and shrink with the seasons. These ice caps are made mainly of water ice—the same kind of ice you'd find on Earth. However, the snow that falls there is made of carbon dioxide—the same ingredient used to make dry ice here on Earth. Carbon dioxide is in the Martian atmosphere and it freezes and falls to the surface of the planet as snow. In 2017, NASA's Mars Reconnaissance Orbiter took photos of the sand dunes around Mars' north pole. The slopes of these dunes were covered with carbon dioxide snow and ice.



NASA's Mars Reconnaissance Orbiter captured this image of carbon dioxide snow covering dunes on Mars. Credit: NASA/JPL/University of Arizona

A Moon of Jupiter: Io

There are dozens of moons that orbit Jupiter and one of them, called Io, has snowflakes made out of sulfur. In 2001, NASA's Galileo spacecraft detected these sulfur snowflakes just above Io's south pole. The sulfur shoots into space from a volcano on Io's surface. In space, the sulfur quickly freezes to form snowflakes that fall back down to the surface.

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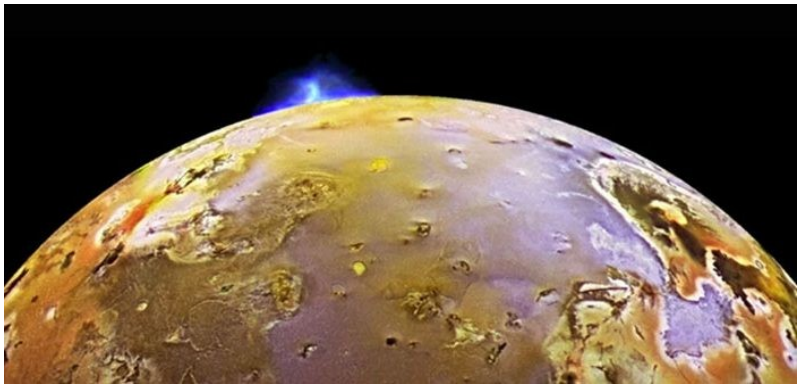
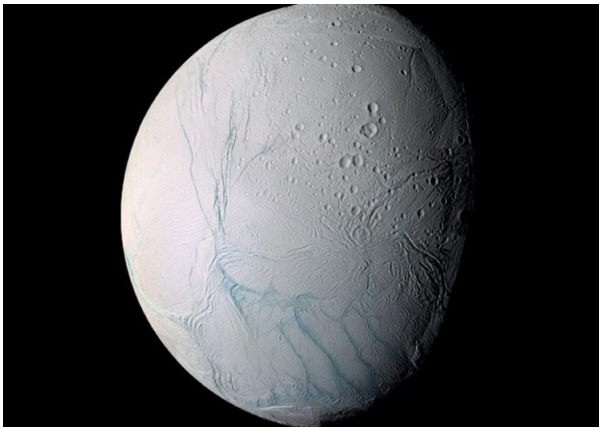


A volcano shooting molten sulfur out from the surface of Io. Credit: NASA/JPL-Caltech

A Moon of Saturn: Enceladus

Saturn's moon, Enceladus, has geysers that shoot water vapor out into space. There it freezes and falls back to the surface as snow. Some of the ice also escapes Enceladus to become part of Saturn's rings. The water vapor comes from a heated ocean which lies beneath the moon's icy surface. (Jupiter's moon Europa is also an icy world with a liquid ocean below the frozen surface.) All of this ice and snow make Enceladus one of the brightest objects in our solar system.



Enceladus as viewed from NASA's Cassini spacecraft. Credit: NASA

A Moon of Neptune: Triton

Neptune's largest moon is Triton. It has the coldest surface known in our solar system. Triton's atmosphere is made up mainly of nitrogen. This nitrogen freezes onto its surface covering Triton with ice made of frozen nitrogen. Triton also has geysers like Enceladus, though they are smaller and made of nitrogen rather than water.

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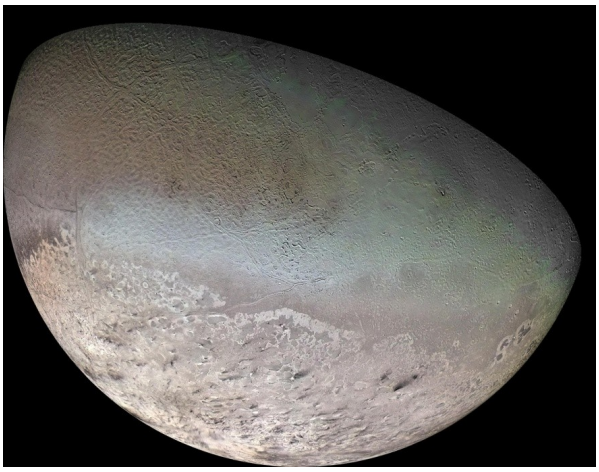
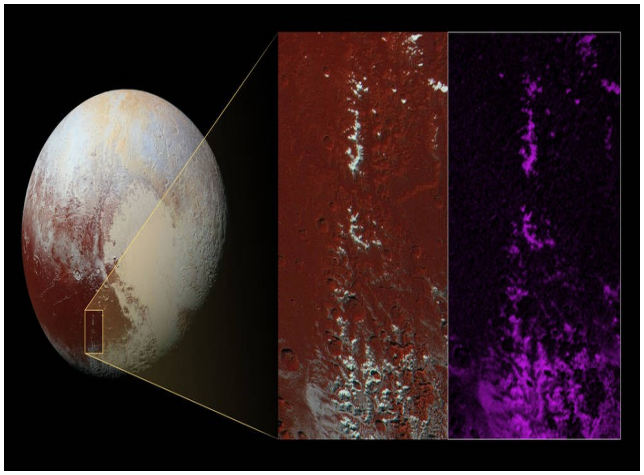


The Voyager 2 mission captured this image of Triton. The black streaks are created by nitrogen geysers. Credit: NASA/JPL/USGS

Pluto

Farther out in our solar system lies the dwarf planet Pluto. In 2016, scientists on the New Horizons mission discovered a mountain chain on Pluto where the mountains were capped with methane snow and ice.



The snowy Cthulhu (pronounced kuh-THU-lu) mountain range on Pluto. Credits: NASA/JHUAPL/SwRI

Beyond Our Solar System

There might even be snow far outside our solar system! Kepler-13Ab is a hot, giant planet 1,730 light years from Earth. It's nine times more massive than Jupiter and it orbits very close to its star. The Hubble Space Telescope detected evidence of titanium oxide—the mineral used in sunscreen—in this planet's upper atmosphere. On the cooler side of Kepler-13Ab that faces away from its host star, the planet's strong gravity might cause the titanium oxide to fall down as "snow."

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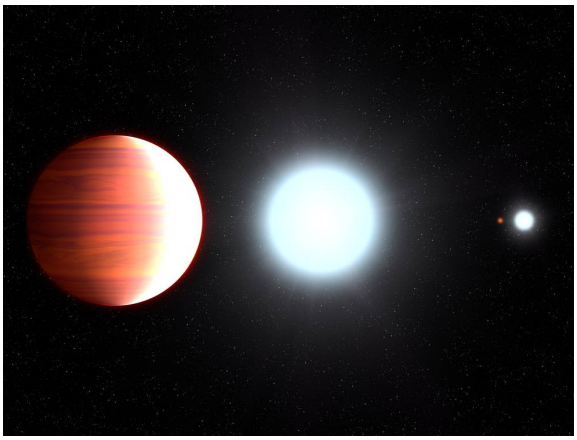

This is an artist's illustration of what Kepler-13Ab might look like.
Credit: NASA/ESA/G. Bacon (STScI)

Want to learn more about weather on other planets? Check out NASA Space Place:
https://spaceplace.nasa.gov/planet-weather

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Space Place

January 2018

Sixty Years of Observing Our Earth

- by Teagan Wall

Satellites are a part of our everyday life. We use global positioning system (GPS) satellites to help us find directions. Satellite television and telephones bring us entertainment, and they connect people all over the world. Weather satellites help us create forecasts, and if there's a disaster—such as a hurricane or a large fire—they can help track what's happening. Then, communication satellites can help us warn people in harm's way.

There are many different types of satellites. Some are smaller than a shoebox, while others are bigger than a school bus. In all, there are more than 1,000 satellites orbiting Earth. With that many around, it can be easy to take them for granted. However, we haven't always had these helpful eyes in the sky.

The United States launched its first satellite on Jan. 31, 1958. It was called Explorer 1, and it weighed in at only about 30 pounds. This little satellite carried America's first scientific instruments into space: temperature sensors, a microphone, radiation detectors and more.

Explorer 1 sent back data for four months, but remained in orbit for more than 10 years. This small, relatively simple satellite kicked off the American space age. Now, just 60 years later, we depend on satellites every day. Through these satellites, scientists have learned all sorts of things about our planet.

For example, we can now use satellites to measure the height of the land and sea with instruments called altimeters. Altimeters bounce a microwave or laser pulse off Earth and measure how long it takes to come back. Since the speed of light is known very accurately, scientists can use that measurement to calculate the height of a mountain, for example, or the changing levels of Earth's seas.

Satellites also help us to study Earth's atmosphere. The atmosphere is made up of layers of gases that surround Earth. Before satellites, we had very little information about these layers. However, with satellites' view from space, NASA scientists can study how the atmosphere's layers interact with light. This tells us which gases are in the air and how much of each gas can be found in the atmosphere. Satellites also help us learn about the clouds and small particles in the atmosphere, too.

When there's an earthquake, we can use radar in satellites to figure out how much Earth has moved during a quake. In fact, satellites allow NASA scientists to observe all kinds of changes in Earth over months, years or even decades.

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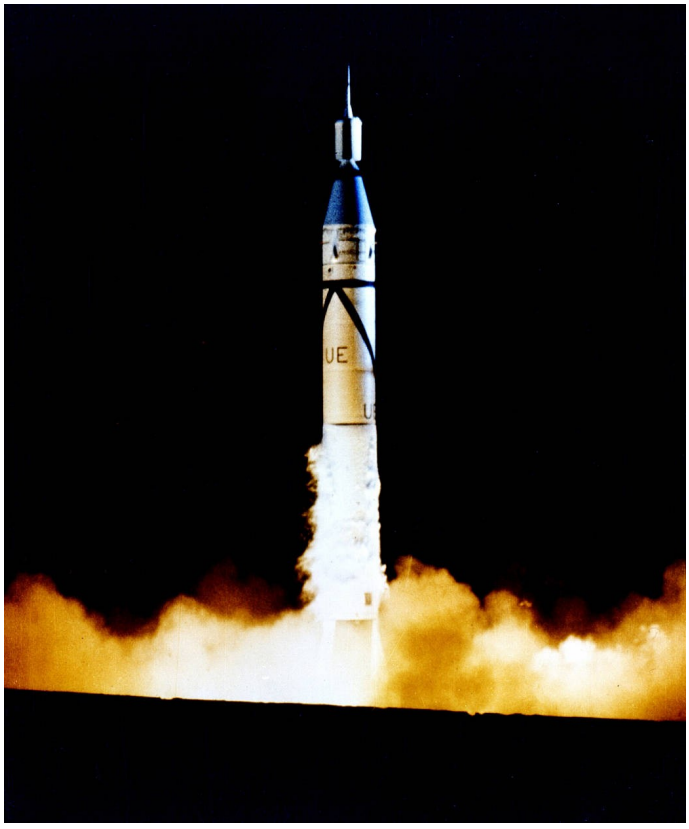
Satellites have also allowed us—for the first time in civilization—to have pictures of our home planet from space. Earth is big, so to take a picture of the whole thing, you need to be far away. Apollo 17 astronauts took the first photo of the whole Earth in 1972. Today, we're able to capture new pictures of our planet many times every day.

Today, many satellites are buzzing around Earth, and each one plays an important part in how we understand our planet and live life here. These satellite explorers are possible because of what we learned from our first voyage into space with Explorer 1—and the decades of hard work and scientific advances since then.

To learn more about satellites, including where they go when they die, check out NASA Space Place: https://spaceplace.nasa.gov/spacecraft-graveyard



This photo shows the launch of Explorer 1 from Cape Canaveral, Fla., on Jan. 31, 1958. Explorer 1 is the small section on top of the large Jupiter-C rocket that blasted it into orbit. With the launch of Explorer 1, the United States officially entered the space age.
Image credit: NASA

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