The Astronews

HUI KILOLANI

Volume 62, Issue 3

March 2014

www.hawastsoc.org

NASA'S IRIS SPOTS ITS LARGEST SOLAR FLARE

On Jan. 28, 2014, NASA's Interface Region Imaging Spectrograph, or IRIS, witnessed its strongest solar flare since it launched in the summer of 2013. Solar flares are bursts of x-rays and light that stream out into space, but scientists don't yet know the fine details of what sets them off.

IRIS peers into a layer of the sun's lower atmosphere just above the surface, called the chromosphere, with unprecedented resolution. However, IRIS can't look at the entire sun at the same time, so the team must always make decisions about what region might provide useful observations. On Jan. 28, scientists spotted a magnetically active region on the sun and focused IRIS on it to see how the solar material behaved under intense magnetic forces. At 2:40 p.m. EST, a moderate flare, labeled an M-class flare -- which is the second strongest class flare after X-class – erupted from the area, sending light and x-rays into space.

IRIS studies the layer of the sun's atmosphere called the chromosphere that is key to regulating the flow of energy and material as they travel from the sun's surface out into space. Along the way, the energy heats up the upper atmosphere, the corona, and sometimes powers solar events such as this flare.

IRIS is equipped with an instrument called a spectrograph that can separate out the light it sees into its individual wavelengths, which in turn correlates to material at different temperatures, velocities and densities. The spectrograph on IRIS was pointed right into the heart of this flare when it reached its peak, and so the data obtained can help determine

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Inside this issue:

Upcoming Events:

☆The next meeting is 7:30PM on **Tues., Mar 4** at the Bishop Museum.

☆Bishop Museum's next evening planetarium shows are every Saturday of the month at 8:00 p.m. www.bishopmuseum.org/calendar

☆The next Board Meeting is Sun., **Mar 2** at 3:30 p.m. at the POST building at UH.

Up To The Minute:

NSN News

FLASH:

There will be a telecon on MISSION MARS by Dr. Pascal Lee on 26 Mar 2014 at 3:00 PM. Details can be found on the Night Sky Network web page by clicking on the March calendar and then clicking on the link for Mission Mars on 26 Mar 14. For additional info contact the NSN Coordinator, John Gallagher, at 683-0118 and leave a message.

Clear Nights,
John

LARGEST SOLAR FLARE
cont. from page 1

how different temperatures of material flow, giving scientists more insight into how flares work.

The IRIS mission is managed by the Lockheed Martin Solar and Astrophysics Laboratory of the ATC in Palo Alto, Calif. NASA's Ames Research Center in Moffett Field, Calif., is responsible for mission operations and the ground data system. The Ames Pleiades supercomputer is used to carry out many of the numerical simulations that are led by the University of Oslo. The IRIS telescope was designed and built by the Smithsonian Astrophysical Observatory while Montana State University faculty and students assisted in the design of the spectrograph. A large volume of science data is downlinked via Kongsberg Satellite Services, (KSAT) facilities through a cooperative agreement between NASA and the Norwegian Space Centre. NASA's Goddard Space Flight Center in Greenbelt, Md., oversees the Explorers Program from which IRIS evolved.

(see image for this story on page 3)

☆ **Story courtesy NASA**

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The Astronews is a monthly newsletter of the Hawaiian Astronomical Society. Contributions are welcome. Send them to the Editor via email. The deadline is the 16th of each month. We are not responsible for unsolicited artwork.

In February we had a talk about the 30-meter telescope proposed for Mauna Kea. The HAS Board of Directors though it would be a good idea to write a letter to the editor of the Star-Advertiser in support of the plan. Here is the letter we submitted:

Dear Editor,

The Thirty Meter Telescope (TMT) proposed for construction on Mauna Kea is currently seeking final regulatory approval. The TMT would keep the astronomical facilities in Hawaii at the forefront of research capabilities for decades to come. Other telescopes of similar large size have been proposed, and some will likely be built, but this is the only one proposed for the northern hemisphere, so it would be able to observe parts of the sky not visible at other proposed sites.

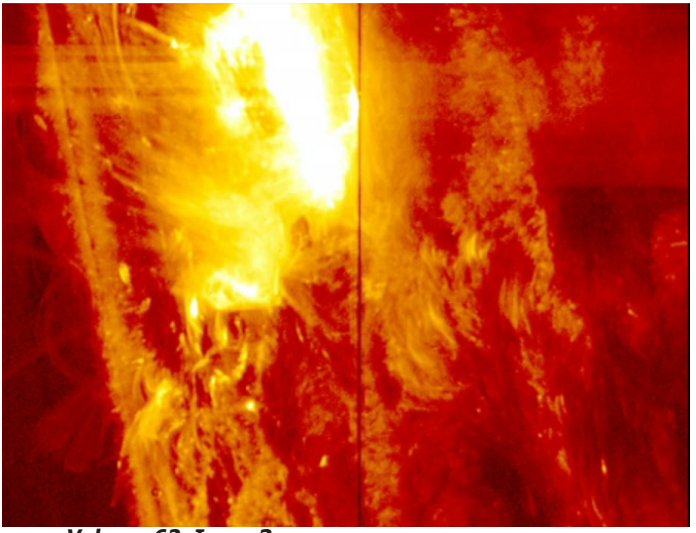
In the past, some groups, mainly indigenous Hawaiians, have objected to Mauna Kea being used for telescopes without much benefit coming to the local community. The proponents of the TMT have wisely taken this into account and have offered many significant benefits. These include much higher lease rent than is paid by other telescopes, a million dollar per year contribution to a fund to promote science and technology education through scholarships and program development, and a Workforce Pipeline Program to develop and recruit local students for employment by TMT.

The TMT group has also worked hard to select a location with no impact on living organisms or cultural artifacts. The facility also will be built to minimize its visual impact from other parts of the island.

Astronomy is an endeavor in which Hawaii is truly a world leader. The TMT will help continue that tradition as well as encourage and assist local youth to develop skills that will allow them to have good jobs here in Hawaii.

For these and other reasons, the members of our Board of Directors and I strongly support allowing construction of the TMT.

Chris Peterson
President, Hawaiian Astronomical Society



On Jan. 28, 2014, NASA's IRIS witnessed its strongest solar flare since it launched in the summer of 2013. See story on page 1

Image Credit: NASA/IRIS

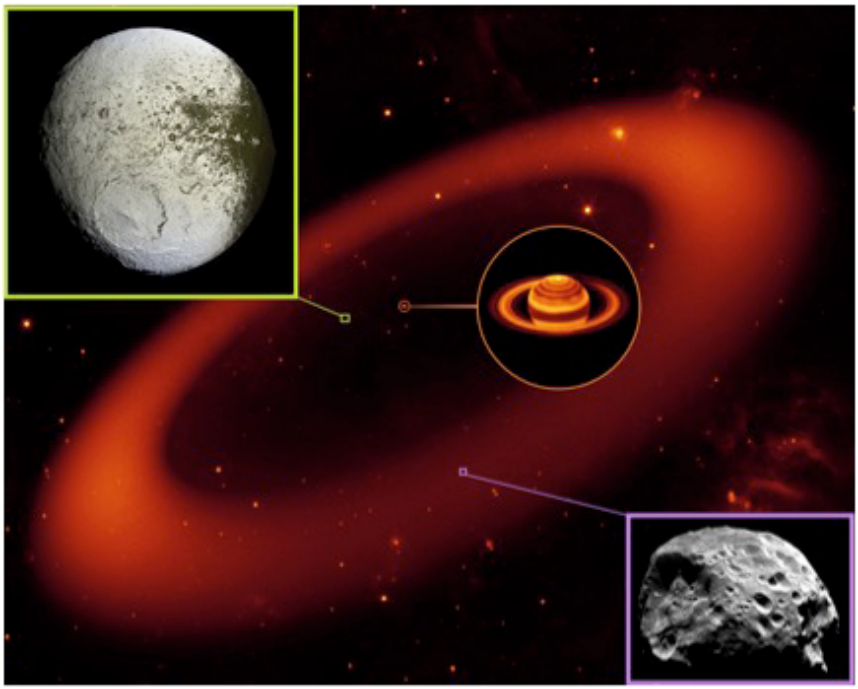
NASA's Space Place

A Two-Toned Wonder from the Saturnian Outskirts

By Dr. Ethan Siegel

Although Saturn has been known as long as humans have been watching the night sky, it's only since the invention of the telescope that we've learned about the rings and moons of this giant, gaseous world. You might know that the largest of Saturn's moons is Titan, the second largest moon in the entire Solar System, discovered by Christiaan Huygens in 1655. It was just 16 years later, in 1671, that Giovanni Cassini (for whom the famed division in Saturn's rings—and the NASA mission now in orbit there—is named) discovered the second of Saturn's moons: Iapetus. Unlike Titan, Iapetus could only be seen when it was on the west side of Saturn, leading Cassini to correctly conclude that not only was Iapetus tidally locked to Saturn, but that its trailing hemisphere was intrinsically brighter than its darker, leading hemisphere. This has very much been confirmed in modern times!

In fact, the darkness of the leading side is comparable to coal, while the rest of Iapetus is as white as thick sea ice. Iapetus is the most distant of all of Saturn's



Images credit: Saturn & the Phoebe Ring (middle) - NASA / JPL-Caltech / Keck; Iapetus (top left) - NASA / JPL / Space Science Institute / Cassini Imaging Team; Phoebe (bottom right) - NASA / ESA / JPL / Space Science Institute / Cassini Imaging Team.

No Meteor Information filed this month.

MOON PHASES

First Quarter	*Full Moon*	*Last Quarter*	*New Moon*
Mar 08	**Mar 16**	**Mar 24**	**Mar 1/30**

Milky Way stretches over the windmills on the north end of Hawaii Island. (Photo used by permission by Ethan Tweedie)

A Perseid meteor from 2010. A Perseid meteor streaks over the Pacific Ocean south of Kauai, Hawaii (file picture). Photograph by Jeffrey Berkes

Keep looking up! ***Tom Giguere***, 808-782-1408, ***Thomas.giguere@yahoo.com***
Mike Morrow, PO Box 6692, Ocean View, HI 96737

Planets Close To the Moon

Times are Hawaii Standard Time

Mar 3, 00h, M 2.3° NNW of Uranus
(28° from sun in evening sky)

Mar 10, 00h, M 5.1° S of Jupiter
(110° from sun in evening sky)

Mar 18, 16h, M 3.1° SSW of Mars
(152° from sun in morning sky)

Mar 20, 17h, M 0.25° SSW of Saturn
(127° from sun in morning sky)

Mar 26, 20h, M 3.6° NNW of Venus
(46° from sun in morning sky)

Mar 28, 01h, M 4.8° NNW of Neptune
(31° from sun in evening sky)

Mar 28, 15h, M 5.9° NNW of Mercury
(23° from sun in morning sky)

Other Events of Interest

Times are Hawaii Standard Time

Mar 9, (2nd Saturday in March)
Mainland changes to **daylight savings time.**

Mar 13, 20h, Mercury at greatest elongation (27.5° west of the sun in morning sky)

Mar **16, 07:10h, Moon Full**

Mar 20, 06:57h,
Vernal (spring) equinox

Mar 22, 09h, Venus at greatest elongation (46.6° west of the sun in morning sky)

Mar 30, 08:47h New Moon

☿ Mercury

Mercury has a rather poor apparition in the morning most of the month. Reaches maximum elongation on Mar 13.

♀ Venus

Shines brightly in the morning sky, rising about two hours before the sun.

♂ Mars

Rises about 9:30 pm at the beginning of the month and near sunset at the end March as it approaches opposition on April 8.

♃ Jupiter

Jupiter shines brightly in the southwest after sunset, setting between 2 to 3 hours after the sun.

♄ Saturn

Saturn rises just before midnight and is visible in the morning sky.

♅ Uranus

Starts the month very low in the southwest and quickly becomes lost in the glare of the sun.

♆ Neptune

Starts the month very low in the southwest and quickly becomes lost in the glare of the sun.

♇ Dwarf Planet Pluto

Pluto rises after midnight and is visible in the early morning hours.

⚳ Dwarf Planet 1 Ceres

Rises after midnight and is visible in the early morning hours.

Meeting Minutes

by Gretchen West

President Chris Peterson called the February 4, 2014 meeting of the Hawaiian Astronomical Society to order at 7:42p.m. The meeting was held in the Planetarium on the grounds of the Bishop Museum, Honolulu. There were 28 individuals in attendance.

Hawaii Space Lecture Series: This month's lecture is scheduled for Tuesday, February 25. Dr. Paul Lucey, HIGP, will be speaking on "The Icy Poles of the Moon: The Most Valuable Real Estate in the Solar System." Regular lectures usually take place at the NASA Pacific Regional Planetary Data Center, room 544 in the Pacific Ocean Science and Technology Building on the Manoa campus of the University of Hawaii. Should you be interested in upcoming lectures or for information you can contact NASA PRPDC at 808-956-3132 or go to *http://www.higp.hawaii.edu/prpdc*.

Upcoming Meeting Info: The March meeting will feature a talk by Dr. Andrew Howard, who will speak on Earth sized exo-planets.

Aloha to John Dobson: ***Chris Peterson*** spoke briefly about the achievements of John Dobson, who recently passed away. John Dobson has been credited with greatly popularizing amateur astronomy. His hands-on approach to astronomy, to engage the general public in viewing the heavens above, and developing ways of creating telescopes that travel with the astronomer rather than being anchored in place, energized star-gazers all over the world. Chris Peterson also recounted how vocal John Dobson was on various astronomical subjects, such as the "Big Bang" theory.

FYI: ***Chris Peterson*** spoke briefly about the Kepler Mission and spacecraft. The spacecraft will switch its viewing area to compensate for a faulty mechanism. Kepler has identified a unstable planetary system with unusual orbital properties.

Digital Projector: ***Barry Peckham*** has constructed a pedestal for the projector and also a cabinet which will be used for the storage of the projector, as well as eye pieces for our rental scopes.

Reports: The International Observe the Moon night takes place on August 30, 2014. We will not be taking part in the Iolani School Space Night this year. ***John Gallagher*** reports that he has received the new Geiger Park use permit, for our suburban star parties in West O`ahu. There will be a lunar eclipse on April 14, 2014.

School Star Parties: ***John Gallagher*** reports that we have two upcoming school star partied early in February:

Friday, Feb. 7th – Waikiki Elementary School
Wednesday, Feb. 19th – Mililani Ike

John also wants to have a point of contact for Night Sky events at Kahala and Geiger parks. ***Chris Peterson and John Gallagher*** volunteered for their respective park locations.

Discussion: ***Charlie Rykken's*** inquiry about a Harvard professor's concept of the post "Big Bang" universe sparked discussion. This led to another area of discussion and some explanation regarding the amount of water on Earth's moon.

Guest Speaker: Our speaker this month joined us from the Big Island of Hawaii. Sandra Dawson, Manager of Hawaii Community Affairs for the Big Island's Thirty Meter Telescope Project, presented "Thirty Meter Telescope (TMT): Reaching Out and Reaching Beyond, to help the members assembled to better understand the physical footprint of TMT on the slopes of Mauna Kea and the community involvement that TMT and its staff are willing to undertake.

Ms. Dawson explained the physical make-up of the scope, with its primary mirror made up of 492 individual segments and a sophisticated Adaptive Optics system. The scope will be outfitted with a suite of spectrometers. With the mentioned instrumentation TMT will "see" more clearly in many instances than the Hubble Space Tele-

(Continued on page 11)

List View Past Events < March 2014 > Upcoming Events Add/Log Event

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
23	24	25	26	27	28	1 6:00 PM Public Star Party(D) Sunset: 6:38 PM
2	3	4 7:30 PM Club Meeting	5	6	7 7:00 PM Niu Valley Middle School	8 6:51 PM Public Star Party(G) 6:50 PM Public Star Party(K) Sunset: 6:40 PM
9	10	11	12	13	14	15 Sunset: 6:42 PM
16	17	18	19	20 7:00 PM Star gazing at PK	21 8:00 PM Globe at Night	22 8:00 PM Globe at Night 6:00 PM Public Star Party(D) Sunset: 6:44 PM
23 8:00 PM Globe at Night	24 8:00 PM Globe at Night	25 8:00 PM Globe at Night	26 8:00 PM Globe at Night 3:00 PM TC: Mission Mars	27 8:00 PM Globe at Night	28 8:00 PM Globe at Night	29 8:00 PM Globe at Night 6:45 PM Club Star Party (D) Sunset: 6:47 PM
30 8:00 PM Globe at Night	31	1	2	3	4	5

<<Upcoming Star Parties>>

Public Party-Dillingham	**Mar 1 & 22**
Kahala/Ewa Public	**Mar 08**
Club Only-Dillingham	**Mar 29**

Upcoming School Star Parties

Fri.	**03/07**	Niu Valley Middle (Honolulu)
Thurs.	**03/20**	Papahana Kuaola (Kaneohe)
Mon.	**04/14**	Punahou Astronomy Club (Honolulu)
Tues.	**05/07**	Ala Wai Elementary (Honolulu)

(Space Place continued from page 4)

large moons, with an average orbital distance of 3.5 million km, but the culprit of the mysterious dark side is four times as distant: Saturn's remote, captured moon, the dark, heavily cratered Phoebe!

Orbiting Saturn in retrograde, or the opposite direction to Saturn's rotation and most of its other Moons, Phoebe most probably originated in the Kuiper Belt, migrating inwards and eventually succumbing to gravitational capture. Due to its orbit, Phoebe is constantly bombarded by micrometeoroid-sized (and larger) objects, responsible for not only its dented and cavity-riddled surface, but also for a huge, diffuse ring of dust grains spanning quadrillions of cubic kilometers! The presence of the "Phoebe Ring" was only discovered in 2009, by NASA's infrared-sensitive Spitzer Space Telescope. As the Phoebe Ring's dust grains absorb and re-emit solar radiation, they spiral inwards towards Saturn, where they smash into Iapetus—orbiting in the opposite direction—like bugs on a highway windshield. Was the dark, leading edge of Iapetus due to it being plastered with material from Phoebe? Did those impacts erode the bright surface layer away, revealing a darker substrate?

In reality, the dark particles picked up by Iapetus aren't enough to explain the incredible brightness differences alone, but they absorb and retain just enough extra heat from the Sun during Iapetus' day to sublimate the ice around it, which resolidifies preferentially on the trailing side, lightening it even further. So it's not just a thin, dark layer from an alien moon that turns Iapetus dark; it's the fact that surface ice sublimates and can no longer reform atop the leading side that darkens it so severely over time. And that story—only confirmed by observations in the last few years—is the reason for the one-of-a-kind appearance of Saturn's incredible two-toned moon, Iapetus!

Learn more about Iapetus here: *http://saturn.jpl.nasa.gov/science/moons/iapetus.*

Kids can learn more about Saturn's rings at NASA's Space Place: *http://spaceplace.nasa.gov/saturn-rings.* ☆

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration

The following poem by John Dobson was set to music and sung by a Vedantan chorus at John's memorial service in Hollywood on February 23rd:

Mother is the hydrogen and Mother is the star
She falls it all together to make us what we are ☆
She makes the heavy elements and throws them all around,
To make the rocky planets with soil on the ground.
She scatters the ingredients across the planet earth,
Assembling them with sunlight to give us all our birth. ☆
Mother is the hydrogen and Mother is the star,
She falls it all together to make us what we are.
She shines the Sun on all these plants; the oxygen is waste. ☆
We munch the plants and huff and puff, and run around in haste.

But we, poor dears, so mean of heart assume we're in the know,
And thinking we can manage fail to see Who runs the show. ☆
Mother is the hydrogen and Mother is the star,
She falls it all together to make us what we are.

HAS Financial Report for the month ending as of Feb. 15, 2014

Initial Balance:	**$3,781.61**
Income:	
Donations	46.00
Dues Received	146.00
Total Income:	**$192.00**
Expenses:	
Equipment	308.49
Excise Tax	18.00
Misc.	40.00
Refreshments	22.00
Total Expenses:	**$388.49**
Final Balance	**$3,585.12**

HAS welcomes new members ***Noel, Donna, & Madeleine Villamil and Gary Chock!***

Thanks to all members who ***renewed*** their membership this month or gave a donation. A reminder to those whose membership expired at the end of last year. **Check your mailing label for your anniversary date.**

NOTICE:

HAS will publish a complete listing of Club members in the **June 2014** issue of the Astronews. This publication is required by Club by-laws, Article III, Section 2 Para C(e) and Article VIII, Section 1B. Unless notified otherwise, this list will include all member's names, mailing addresses, and phone numbers. If you wish to have some or all of your data excluded, please notify the Club Treasurer, ***April Lew*** before **May 15, 2014**.

Please be advised that this listing is intended for Club members' personal use only in contacting one another. *It is not to be used for any commercial or solicitation purposes.* With the exception of our membership in the Astronomical League, HAS does make this list available to, nor do we sell its contents to anyone for any purpose. Please respect our member's right to privacy.

Member information is not to be republished, redistributed, or used for any commercial or solicitation purposes.

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scope. TMT will be the product of the University of California, California Institute of Technology, the Association of Canadian Universities for Research in Astronomy (ACURA), The National Astronomical Observatory of Japan (NAOJ), the National Astronomical Observatory of the Chinese Academy of Science, and the Department of Science and Education of India.

Ms. Dawson spoke not only about the scientific perspective regarding TMT, but she also spoke of the commitment TMT will be making to the community in which it will reside. She explained that TMT is committed to fulfilling its role as a member of the community in and around its Mauna Kea home. The physical footprint of the telescope will be minimized. The footprint will be more compact. TMT is supporting educational partnerships with the community. Fostering a pool of highly qualified pool of local workers for the community of the Big Island is also a goal for TMT.

Ms. Dawson stressed that making TMT a reality on the Big Island will ensure that the astronomy community in Hawaii remains second to none. Should the project fall through jeopardizes Mauna Kea's predominance as a world renown research site.

Ms. Dawson enlisted the help of the Hawaiian Astronomical Society in supporting the effort to get the project through the last of its hurdles in the courts, the backing by the University of Hawaii and the community. She asked that we send letters of support to the powers that be and that we provide visible support at meetings and discussions.

Planetarium: ***Joanne Bogan*** gave the membership another wonderful ride through the galaxies, using the power of the Bishop Museum's Planetarium. It is always wonderful to sit back and have a guided tour of the universe.

Mahalo/; As there was no further business, the meeting was adjourned at 9:12 p.m. Members enjoyed tasty refreshments supplied by ***Charles Rykken***.

Respectfully Submitted,

Gretchen West

HAS Secretary

Images of China with ancient astronomical instruments from last month's article from John Sandor and Joanne Bogan. See February 2014 issue of AstroNews.

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