Vol.72 No.1* Jan-Feb, 2015

SVAS OBSERVER

Sacramento Valley Astronomical Society

Founded in 1945

Happy 2015!

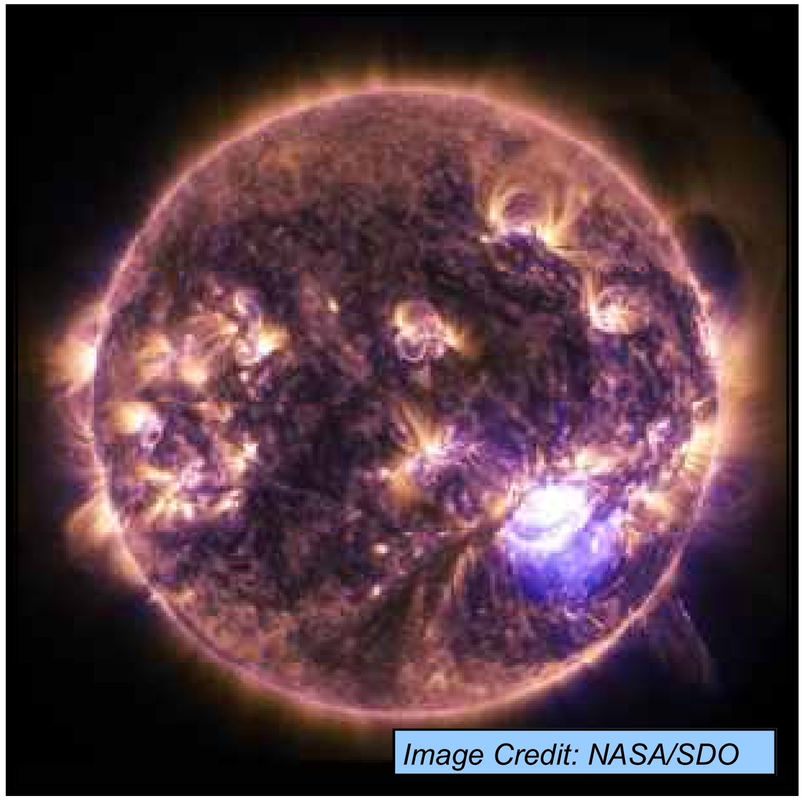


Image Credit: NASA/SDO

Just in time for the holidays, our Sun emitted a significant X1.8 class flair in December that looks a lot like Christmas lights! Its great to see the astro gods getting into the spirit of the season. If it was any stronger it could have affected Santa's GPS.

Great news for 2015! We have a new Celestron GEM1400 (14" Schmidt Cassegrain on a German Equatorial Mount) telescope mounted in the dome at HGO, donated to the SVAS by Mr. Venton. He commented, "It brings me pleasure enough that this **Continued page 6**

Kevin Heider

Inside This Issue

SVAS Event Calendar

Jan 16, General Meeting Friday at 8:00pm

Sacramento City College, Mohr Hall Room 3, 3835 Freeport Boulevard, Sacramento, CA.

Jan 17
Blue Canyon, weather permitting.

Jan 20
New Moon

Jan 23
Jupiter's Io, Callisto, and Europa, transit all together 8:36pm to 10:52pm. Event starts 7:10pm on the 23rd, and ends at 3:04am on the 24th.

Red Spot Transits at 2:24am on the 24th

Feb 6
Jupiter at Opposition

Feb 20, General Meeting Friday at 8:00pm

Sacramento City College, Mohr Hall Room 3, 3835 Freeport Boulevard, Sacramento, CA.

Feb 18
New Moon

Feb 21
Blue Canyon, weather permitting.

Feb 22
Venus and Mars conjunction. Look west at dusk for the 1/2deg separated pair in Pisces.

Happy New Year!

Star Party Schedule for 2015

Star Parties

- Jan 17th
- Feb 21st
- Mar 21st
- April 18th
- May 16th
- June 13th
- July 17-18th, Star-B-Q
- Aug 15th
- Sept 12th
- Oct 10th
- Nov 14th
- Dec 12th

Blue Canyon

Letter From the Editor

This issue marks the beginning of my fourth year producing the SVAS Observer Newsletter, time really flies when we're having so much fun! It all started with the thought if I could just pick up where the last editor left off, get things up and running again, someone would step forward and take over. I honestly didn't think I had the ability to create and write this newsletter, it's been a long time since college! Thank you all for the kind comments that keep me going, contributing articles, and especially for putting up with my poor spelling, punctuation, and grammar. Thank the Astro Gods for spell check!

I've been a SVAS member since the mid 80's (less a few years hiatus), and over the years I have developed a great deal of admiration and respect for all the Officers, Board Members, and last but definitely not least the General Members who make this club great. It takes all of us doing a little to accomplish a lot! Take this moment to pat yourself on the back for a job well done.

A lot of vision is needed to plan for the future of the SVAS. Constantly changing technology alters the astronomy landscape, putting amazing advanced equipment in the hands of amateurs. We at the SVAS need to embrace those changes and share the knowledge with everyone, young and old, utilizing public outreach. Let's not forget about you, the members. I like to call it inreach, because it has everything to do with supporting and enjoying our inner circle of astro friends, HGO, and spending a few selfish private moments (hours-days) doing what we enjoy the most relaxing under the serene calm of star speckled dark night skies. When dawn comes, it's always too soon for me!

Ross Gorman has been President for the last 5 years, and he just resigned. He moved to Wyoming, talk about clear dark skies! We are all going to miss his great guidance, superior decision making, and dedication with club matters, that has kept the SVAS on a steady course. Not to worry however, our Vice President Walt Heiges, now President, has expressed a desire to run again next year for President, bringing with him the experience of countless years of the same dedication to the SVAS. He has great people skills and a vast practical knowledge gained from SVAS membership dating back to the early 90's, serving many terms as President and Vice President, and on the Board of Directors. It's a good feeling knowing our club is in such good hands!

My last thought for today is, no cheering please, make sure you come out and vote next March! It's never been more important than now to get involved and support the candidates of your choice, those who will continue making the SVAS something you can be proud of!

Thank you for the opportunity of serving three great years on the SVAS Board of Directors, ATM Chairman, and the Observer Newsletter Editor.

Lonnie Robinson

SVAS Community Star Parties

Breaking News!

Wayne Lord

Wayne Lord has graciously accepted the position of our Community Star Party leader! President Walt Heiges gave him a call last week to confirm the appointment that was left vacant by Perry P. Porter. Perry has done a commendable job for several years, and has built a strong rapport with many schools, parks, churches, and private gatherings. Wayne has also attended many events with Perry, and is fully briefed on the procedures.

We are confident he will represent the SVAS in an outstanding manner, carrying with him our reputation of professionalism, friendliness, and knowledge of the heavens. Wayne has been my right hand by helping with the newsletter, writing many articles, editing text, and supplying countless great photos. I told him it will be great to have a “reporter for our newsletter” imbedded in the outreach program. Just a small hint there!

Please help support this great program, we need all the volunteers we can get. It’s very rewarding to share your knowledge, especially with the youth. It’s your chance to inspire young minds to explore and appreciate the heavens as we do. Please watch our Yahoo members groups for announcements of upcoming Community Star Parties, and volunteer often.

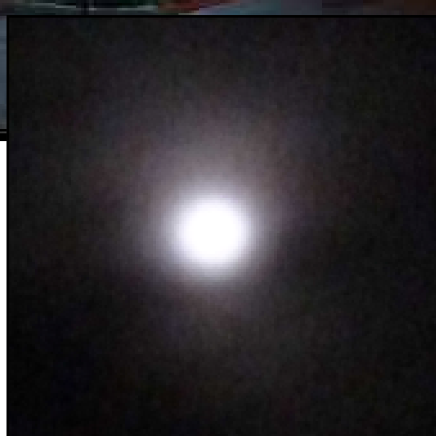
Please give Wayne a call, and pledge your full support!

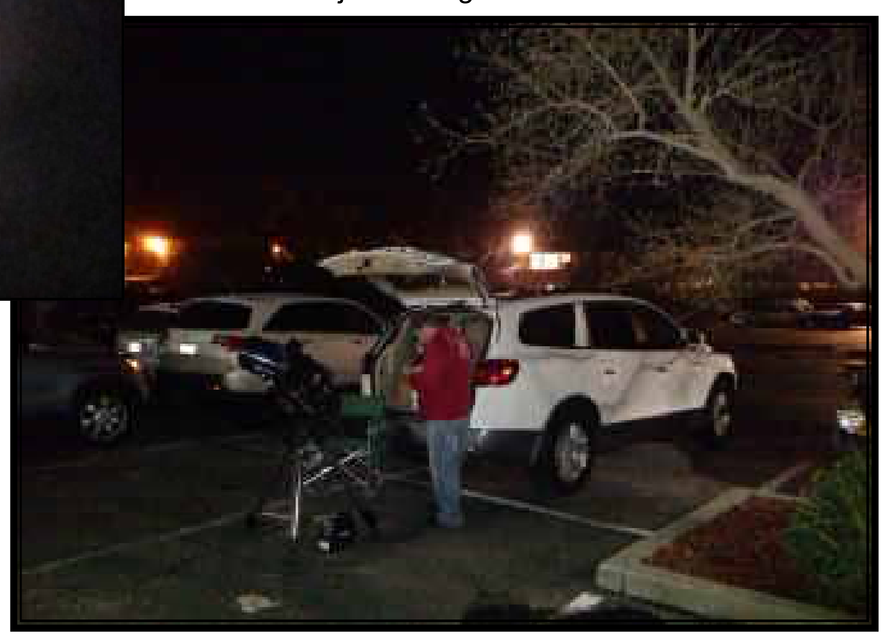
SVAS Observer Editor

Community Star Party

Congregation Beth Shalom

I received the call Thursday, two days before we were asked to do a small single telescope viewing at the Beth Shalom Congregation. Not a problem for me, but the weather was definitely threatening to block our seeing. After confirming we would be there, with a condition of clearing skies, I promised to call again about 5:00pm Saturday (for the 7:00pm star party) to give us a chance to check again for clear skies. All afternoon there was cloud cover, but at 5:00 there was signs of clearing in the west so we decided it was a go. Kevin Heider arrived a little early, and he gave me directions as we talked over our cell phones. When I arrived at 6:00 to set up, the clouds rolled in again leaving only a glimpse of a full Moon in the east. Not to be deterred now, Kevin helped me set up my scope. We had a good crowd of families with young to mid aged children, about 30 in all, checking out the haze covered Moon, and finally about 7:00 it cleared enough to see some surface detail. I almost didn't need my variable polarizer, the full Moon was covered with just enough clouds to dim it to a comfortable viewing level. We had a great time talking astronomy with some very informed people and the kids were amazed at the detail available on the Moon.





Hope to visit there again next year!

SVAS Observer Editor

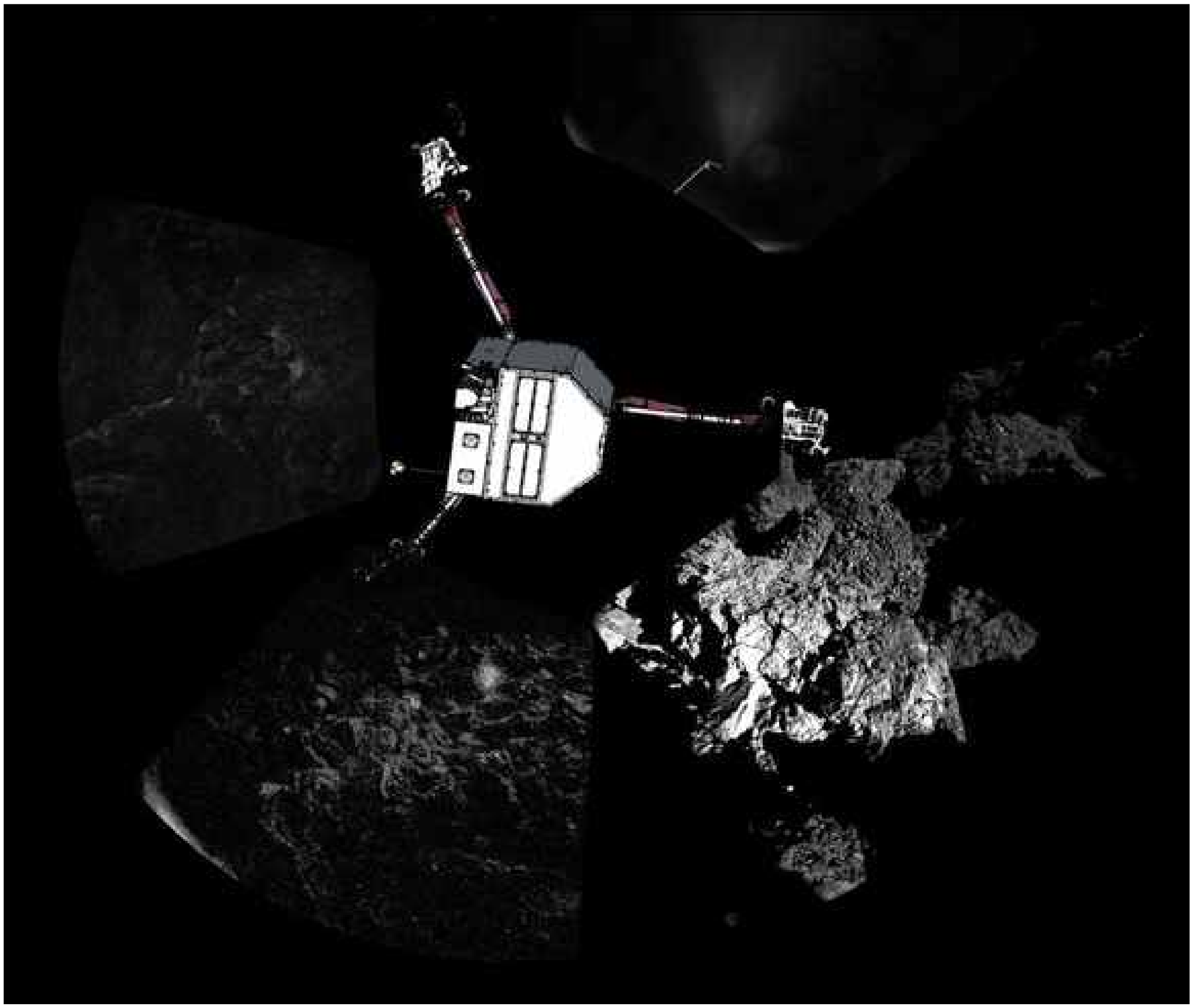
scope will get more use with more people". "I'm excited for it's new life with the SVAS. Enjoy, and put it to work!" We certainly will, and a huge thank you for this generous donation. Walt Heiges, Stuart Schultz, Kevin Heider, and myself all worked hard to make the installation happen. It's an absolutely impressive telescope, carrying with it the beauty and sophistication the dome deserves. The dome was originally designed for a 14" scope, and it fit right in. It's our hope that it will serve visual observers as well as photographers. The dome is the place to be especially in the winter time.

Everything went smoothly after Stuart suggested we use the top part of the tripod and bolt it to the pier plate. Otherwise we would need to machine a round adapter to connect the electronic housing to the pier. Just a couple more small repairs to the finder and focuser, and we were off and running. The Moon photo below is first light through my cell phone camera handheld over the eyepiece. Not the best photo quality, but it caught the moment.

Next we are going to install set screws around the plate, near the bolts, to facilitate leveling the mount. It's close but out just a bit. After leveling it's collimation time. It's out of adjustment a bit too, so a little tweaking is all that's necessary. Then on to drift polar alignment. The adjusters for altitude and azimuth are built in the mount, so it shouldn't be nearly as difficult to align as the Ritchey was.

Photography is a big goal and we need to install a dovetail mounting plate for the guide scope. The focal ratio is high at f/11 (f 3910mm), so a photo reducer will be necessary for wide fields. High power shots should be fantastic. A great option would be to purchase a HyperStar from Starizona. It's a special adapter lens that replaces the secondary in the corrector plate. Then you could attach just about any camera, on the front corrector plate at the main mirror's prime focus, with a resulting f/1.9 (f 684mm)! Talk about wide field photography. Digital SLRs, most all dedicated CCD astronomy cameras, and Mallincam, will work on the C14. The large aperture makes it possible to use larger cameras without significantly increasing the central obstruction. They make a comparison of a Cannon EOS, on a f/5 Apo Refractor, taking one hour (12x5min exposures) to photograph the Trifid and Lagoon nebula. Using the same camera on the HyperStar equipped 14", it took only 90 seconds (9 x 12sec exposures) for identical images! Very little guiding involved, and no refractor chromatic aberration, like blue haloes, around stars. That really speeds up the photo process a bit don't you think. I hope we can obtain a HyperStar in the near future. SVAS Observer Editor

Welcome to a Comet, from Lander on Surface



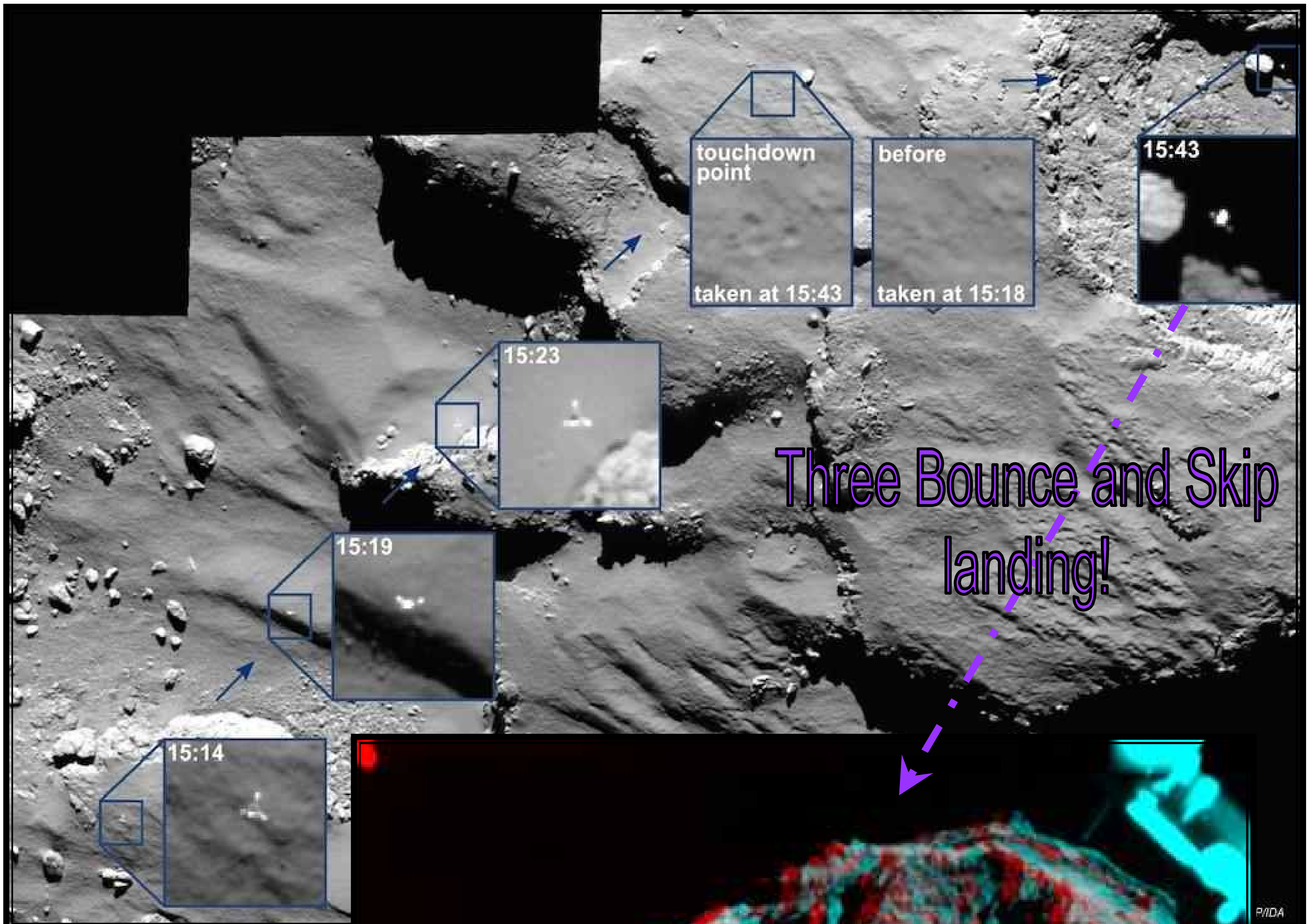
The Philae lander of the European Space Agency's Rosetta mission is safely on the surface of Comet 67P/ Churyumov-Gerasimenko, as these first two images from the lander's CIVA camera confirm. One of the lander's three feet can be seen in the foreground. The view is a two-image mosaic taken on Nov. 12, 2014.

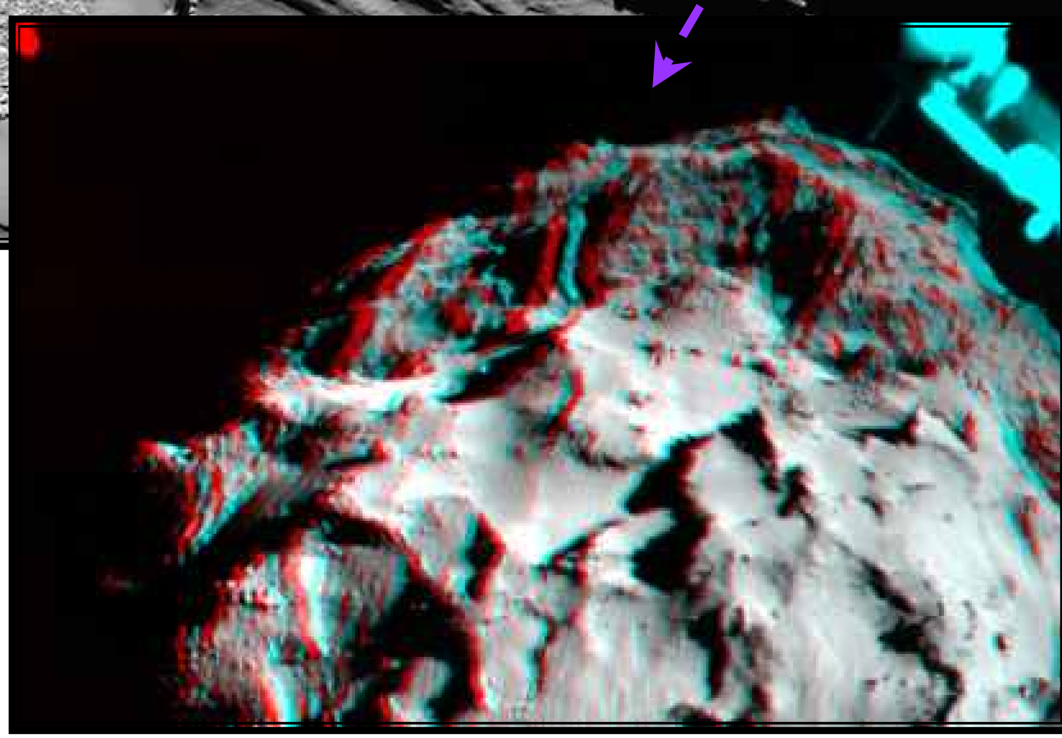
The lander separated from the orbiter at 09:03 UTC (1:03 a.m. PST) for touch down on comet 67P seven hours later. Rosetta and Philae had been riding through space together for more than 10 years. Philae is the first probe to achieve soft landing on a comet, and Rosetta is the first to rendezvous with a comet and follow it around the sun. The information collected by Philae at one location on the surface will complement that collected by the Rosetta orbiter for the entire comet.

Rosetta is a European Space Agency mission with contributions from its member states and NASA. Rosetta's Philae lander is provided by a consortium led by the German Aerospace Center, Cologne; Max Planck Institute for Solar System Research, Gottingen; French National Space Agency, Paris; and the Italian Space Agency, Rome. NASA's Jet Propulsion Laboratory, a division of the California Institute of Technology, Pasadena, manages the U.S. participation in the Rosetta mission for NASA's Science Mission Directorate in Washington. Rosetta carries three NASA instruments in its 21-instrument payload.

Philae Approach and Hopscotch Landing

Rosetta's lander Philae has returned the first panoramic image from the surface of a comet. The view, unprocessed, as it has been captured by the CIVA-P imaging system, shows a 360° view around the point of final touchdown. The three feet of Philae's landing gear can be seen in some of the frames. Confirmation of Philae's touchdown on the surface of Comet 67P/Churyumov–Gerasimenko arrived on Earth at 16:03 GMT/17:03 CET on 12 November.





Credit: ESA/Rosetta/MPS for OSIRIS Team MPS/UPD/LAM/IAA/SSO/INTA/UPM/DASP/IDA

Rosetta's Agenda

With the Philae lander's mission complete, Rosetta will now continue its own extraordinary exploration, orbiting Comet 67P/Churymov–Gerasimenko during the coming year as the enigmatic body arcs ever closer to our Sun. Last week, ESA's Rosetta spacecraft delivered its Philae lander to the surface of the comet for a dramatic touchdown. The lander's planned mission ended after about 64 hours when its batteries ran out, but not before it delivered a full set of results that are now being analysed by scientists across Europe.

Rosetta's own mission is far from over and the spacecraft remains in excellent condition, with all of its systems and instruments performing as expected. "With lander delivery complete, Rosetta will resume routine science observations and we will transition to the 'comet escort phase'," says Flight Director Andrea Accomazzo. "This science-gathering phase will take us into next year as we go with the comet towards the Sun, passing perihelion, or closest approach, on 13 August, at 186 million kilometres from our star."

On 16 November, the flight control team moved from the large Main Control Room at ESA's Space Operations Centre in Darmstadt, Germany, where critical operations during landing were performed, to a smaller Dedicated Control Room, from where the team normally flies the craft. Since then, Rosetta has performed a series of manoeuvres, using its thrusters to begin optimising its orbit around the comet for the 11 scientific instruments. "Additional burns planned for today, 22 and 26 November will further adjust the orbit to bring it up to about 30 km above the comet," says Sylvain Lodiot, Spacecraft Operations Manager. From next week, Rosetta's orbit will be selected and planned based on the needs of the scientific sensors. After arrival on 6 August, the orbit was designed to meet the lander's needs.

Getting as close as feasible

On 3 December, the craft will move down to height of 20 km for about 10 days, after which it will return to 30 km. With the landing performed, all future trajectories are designed purely with science as the driver, explained Laurence O'Rourke and Michael Küppers at the Rosetta Science Operations Centre near Madrid, Spain. "The desire is to place the spacecraft as close as feasible to the comet before the activity becomes too high to maintain closed orbits," says Laurence. "This 20 km orbit will be used by the science teams to map large parts of the nucleus at high resolution and to collect gas, dust and plasma at increasing activity."

Planning the science orbits involves two different trajectories: 'preferred' and 'high-activity'. While the intention is always to fly the preferred path, Rosetta will move to the high-activity trajectory in the event the comet becomes too active as it heats up. "This will allow science operations to continue besides the initial impact on science planning that such a move would entail," adds Michael.

Science takes a front seat

"Science will now take front seat in this great mission. It's why we are there in the first place!" says Matt Taylor, Rosetta Project Scientist. "The science teams have been working intensively over the last number of years with the science operations centre to prepare the dual planning for this phase." When solar heat activates the frozen gases on and below the surface, outflowing gas and dust particles will create an atmosphere around the nucleus, known as the coma.

First spacecraft to track a comet toward the Sun

Rosetta will become the first spacecraft to witness at close quarters the development of a comet's coma and the subsequent tail streaming for millions of kilometres into space. Rosetta will then have to stay further from the comet to avoid the coma affecting its orbit. In addition, as the comet nears the Sun, illumination on its surface is expected to increase. This may provide sufficient sunlight for the DLR-operated Philae lander, now in hibernation, to reactivate, although this is far from certain.

Early next year, Rosetta will be switched into a mode that allows it to listen periodically for beacon signals from the surface.

Collimation Bolts; Why Use Three When Two Will Do?

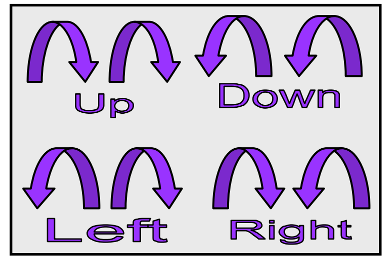
by Lonnie Robinson

I'm crazy you say? Highly likely, but let me begin by describing a problem all Newtonian telescope owners have experienced and it's called **"Mirror Creep"**. Main mirror cells are designed with the necessary collimation bolt travel to accomplish optical alignment. Each time we collimate, we use all three bolts to center the optical axis, but over time this process inevitably ends up moving the mirror cell all the way to one end or the other of the adjustment travel, preventing any further adjustment. The focal point height at the focuser is also moved. Dobsonian truss tube scopes, that require collimation for each assembly, are really prone to this issue. It's really irritating to run out of adjustment, especially when in a hurry to get set up, and you must seriously disturb the collimation to re-center the travel.

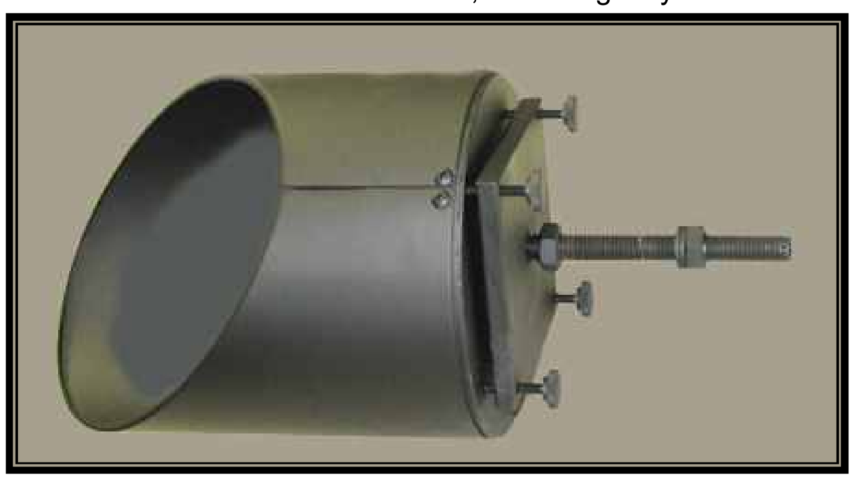
In the past I have recommended the spider made by Protostar as a superb design utilizing a stretchable center nylon bolt. This stretchy bolt puts pressure, like a spring, to all three adjusters, allowing collimation without the need to loosen one screw before tightening another. The springy nylon bolt maintains pressure after adjusting, eliminating retightening of all three adjusters when finished collimating. Really cool! However, to my surprise mirror creep applies to this particular spider too! After many collimation adjustments, my secondary mirror was moved lower and lower, closer to the main mirror and away from the optical axis of the focuser. It also overstretched the nylon bolt, deforming it a bit! Talk about offset, this took it to the extreme. In all fairness, I added my own "Lon's Knobs", which could have lengthened the overall adjustment travel. Again, re-centering the secondary adjusters travel is a major optical alignment issue, not something you want to tackle at the next star party!

The solution to mirror creep is easy, simply use only two adjusting bolts instead of three! Lock one bolt from turning, at the center of it's travel, with a jam nut. This forces the use of only two adjusters and keeps either the secondary or primary mirror from creeping up or down and out of alignment.

I like positioning two of the main mirror cell adjusting bolts at the bottom, resulting in a more stable cell support, and I locked the top adjuster in the center of it's travel. I know it takes a little different thinking while adjusting, but I got use to it right away. If up and down adjustment is needed, simply turn both bolts together in the same direction. Turning the left and right bolts in opposite directions, by the same amount, will tilt left or right without mirror creep. This is still a three directional adjustment, although it feels a lot like two and no need to retighten the bolts when finished (unless you have mirror locking bolts)! (Check out the Hotech laser collimator with a rear view target, it makes these adjustments simple.) Now the mirror cell and spider will no longer creep and change position along the optical axis.



Several of my friends own AstroSystems secondary's and spider's, which have four collimation bolts. This secondary holder by design, without any center bolt spring tension, will not allow mirror creep an no worries about over-stretching a nylon bolt. I kept looking at the four bolts in amazement, why would they use four when everyone else uses three? It seemed to me the extra bolt, while it helps keep larger secondary mirrors stable, was just an extra bolt to get in the way. Randy Cunningham of AstroSystems set me straight, It turns out I was missing a very important point. I was only considering adjusting collimation by loosening two adjacent bolts on one side and tightening two on the other. The proper method is to adjust diagonally opposing bolts, loosening only one and tightening the other allowing the holder to tilt on the other two bolts. When using three bolts you are adjusting in three directions, which actually takes longer than using four diagonal adjustments correcting in only two directions. The four bolts are easy to reach centered between each spider vane. After loosening one corner bolt, and retightening the opposite one, all the bolts remain tight. Two directions, up and down and left and right, suddenly makes collimation much easier. Eureka, that's the reason why it's so popular!



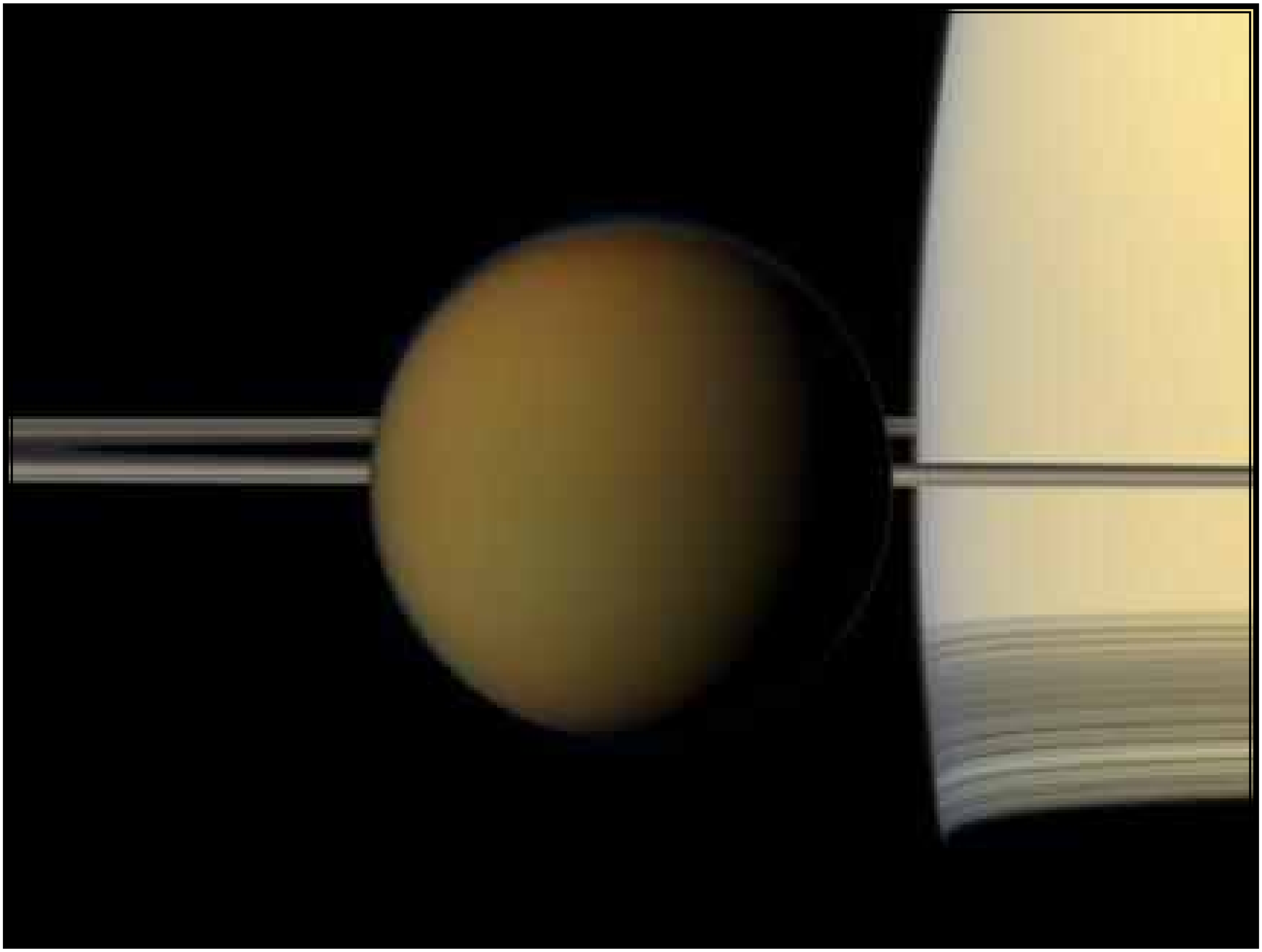
I still like my Protostar with one collimation bolt locked, because only two bolts are necessary without retightening, but AstroSystems is a great choice. It would be difficult to recommend one over the other, but all things considered the four bolt arrangement seems to win the day.

AstroSystems could be improved by reducing the four bolt arrangement to a simpler (speedier) two, by adding stiff springs to two of the four bolts diagonally across from each other and removing their knobs. That would leave only one bolt needed for each adjustment direction without retightening. However, larger secondary's will need ever stiffer springs because of their weight. I wish there was a way to add a single center spring, but that only works with a three bolt arrangement.

Have I completely confused everyone? The goal here is to achieve zero mirror creep, with a simple collimation bolt adjustment, and without retightening. This achieves a no fuss setup, especially appreciated at public star parties with a line of guest viewers forming before you can get things collimated.

I've decided to give the AstroSystems spider a try, who says you can't teach an old dog new tricks. Either one of these spiders will do a superb job! Only two bolts, one for each hand I say!

Titan Upfront



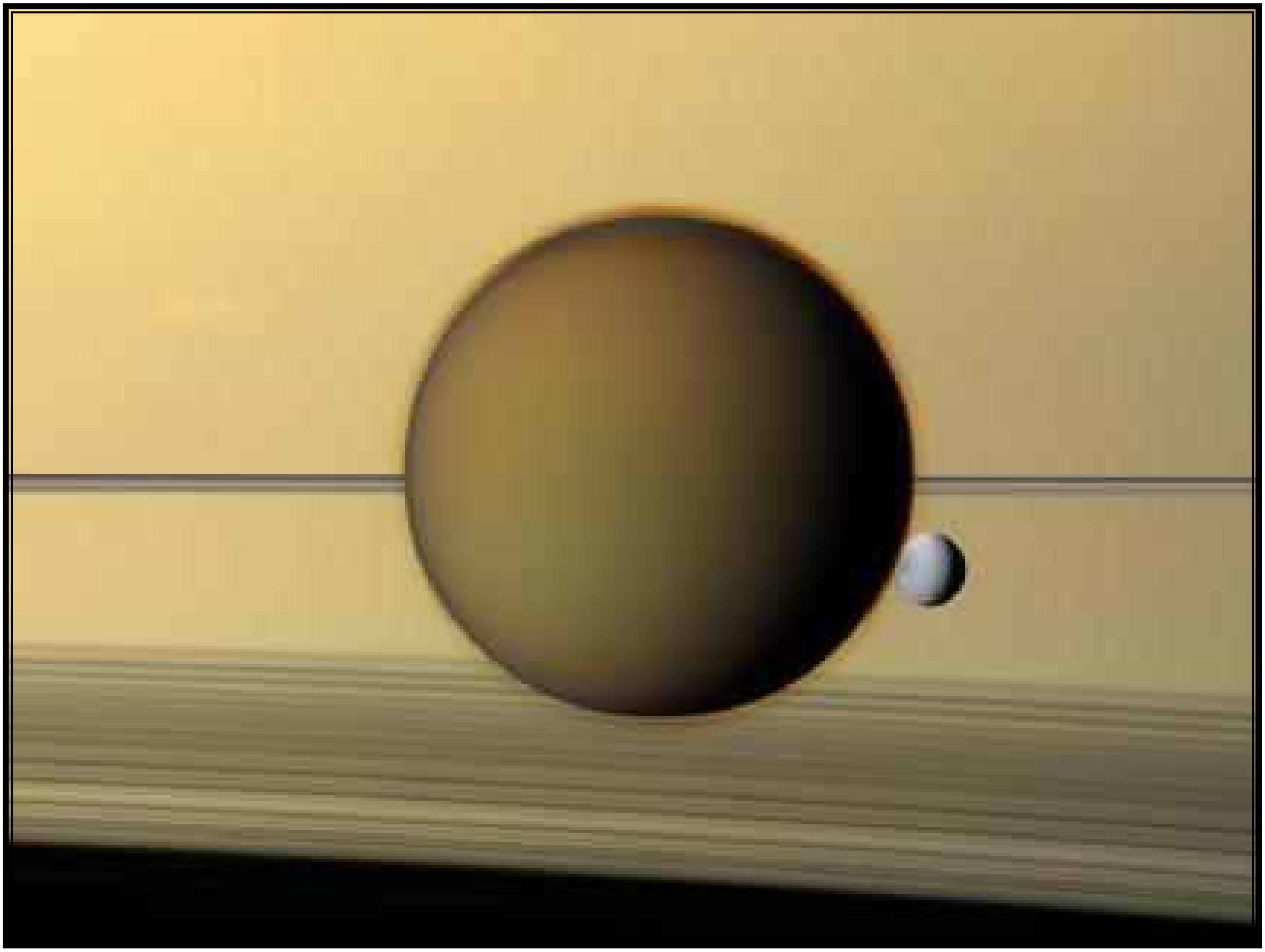
The colorful globe of Saturn's largest moon, Titan, passes in front of the planet and its rings in this true color snapshot from NASA's Cassini spacecraft. The north polar hood can be seen on Titan (3200 miles, 5150 kilometers across) and appears as a detached layer at the top of the moon here.

This view looks toward the northern, sunlit side of the rings from just above the ring plane.

Images taken using red, green and blue spectral filters were combined to create this natural color view. The images were obtained with the Cassini spacecraft narrow-angle camera on May 21, 2011 at a distance of approximately 1.4 million miles (2.3 million kilometers) from Titan. Image scale is 9 miles (14 kilometers) per pixel on Titan.

NASA/JPL-Caltech/Space Science Institute

Titan and Dione



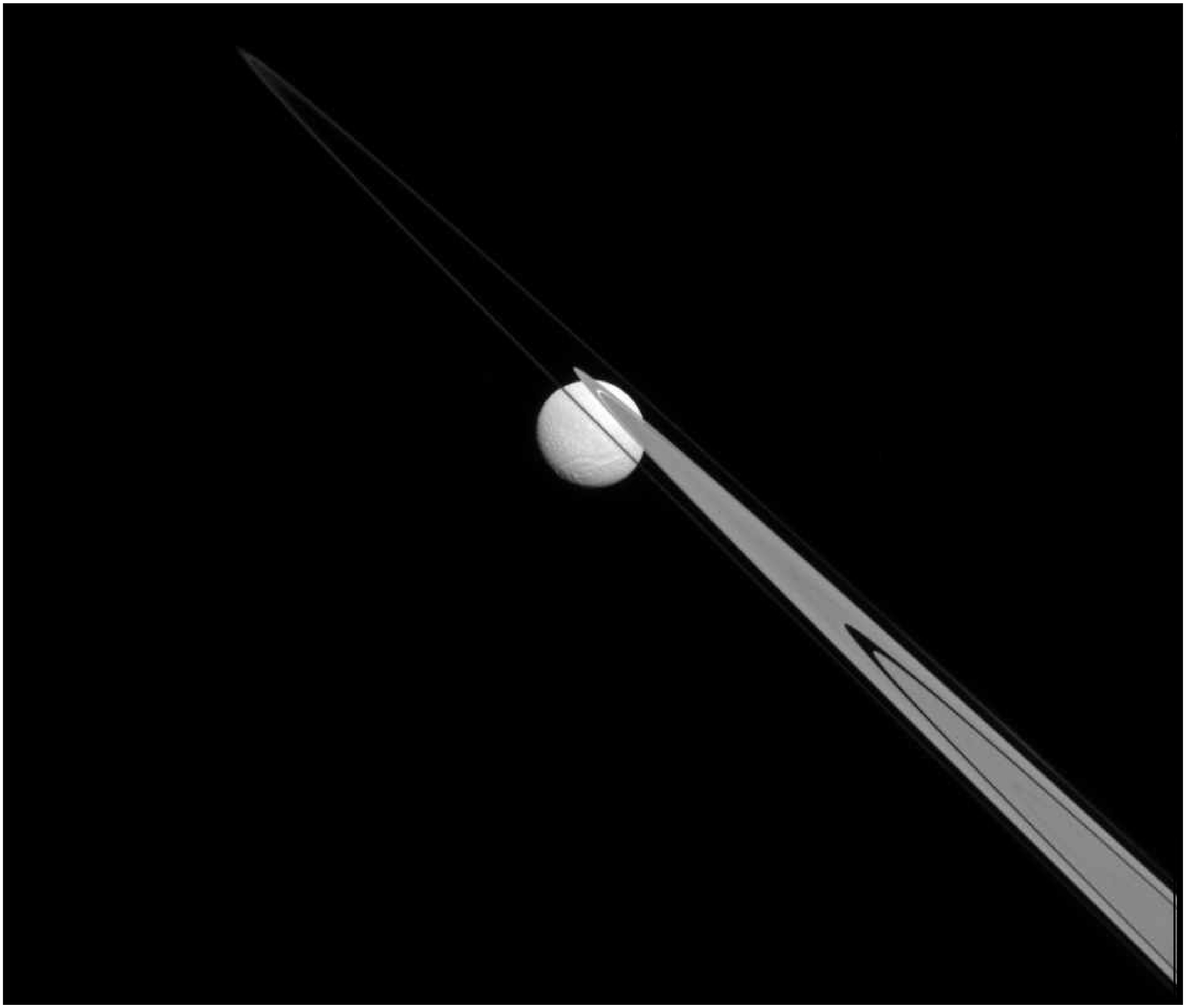
Saturn's third-largest moon Dione can be seen through the haze of its largest moon, Titan, in this view of the two posing before the planet and its rings from NASA's Cassini spacecraft. The north polar hood can be seen on Titan appearing as a detached layer at the top of the moon here.

This view looks toward the anti-Saturn side of Titan (3200 miles, 5150 kilometers across) and Dione (698 miles, 1123 kilometers across). North is up on the moons. This view looks toward the northern, sunlit side of the rings from just above the ring plane.

Images taken using red, green and blue spectral filters were combined to create this natural color view. The images were obtained with the Cassini spacecraft narrow-angle camera on May 21, 2011 at a distance of approximately 1.4 million miles (2.3 million kilometers) from Titan 2 million miles (3.2 million kilometers) from Dione. Image scale is 9 miles (14 kilometers) per pixel on Titan and 12 miles (19 kilometers) on Dione.

Image credit: NASA/JPL-Caltech/Space Science Institute

Tethys Appears Stuck on Saturn's Rings



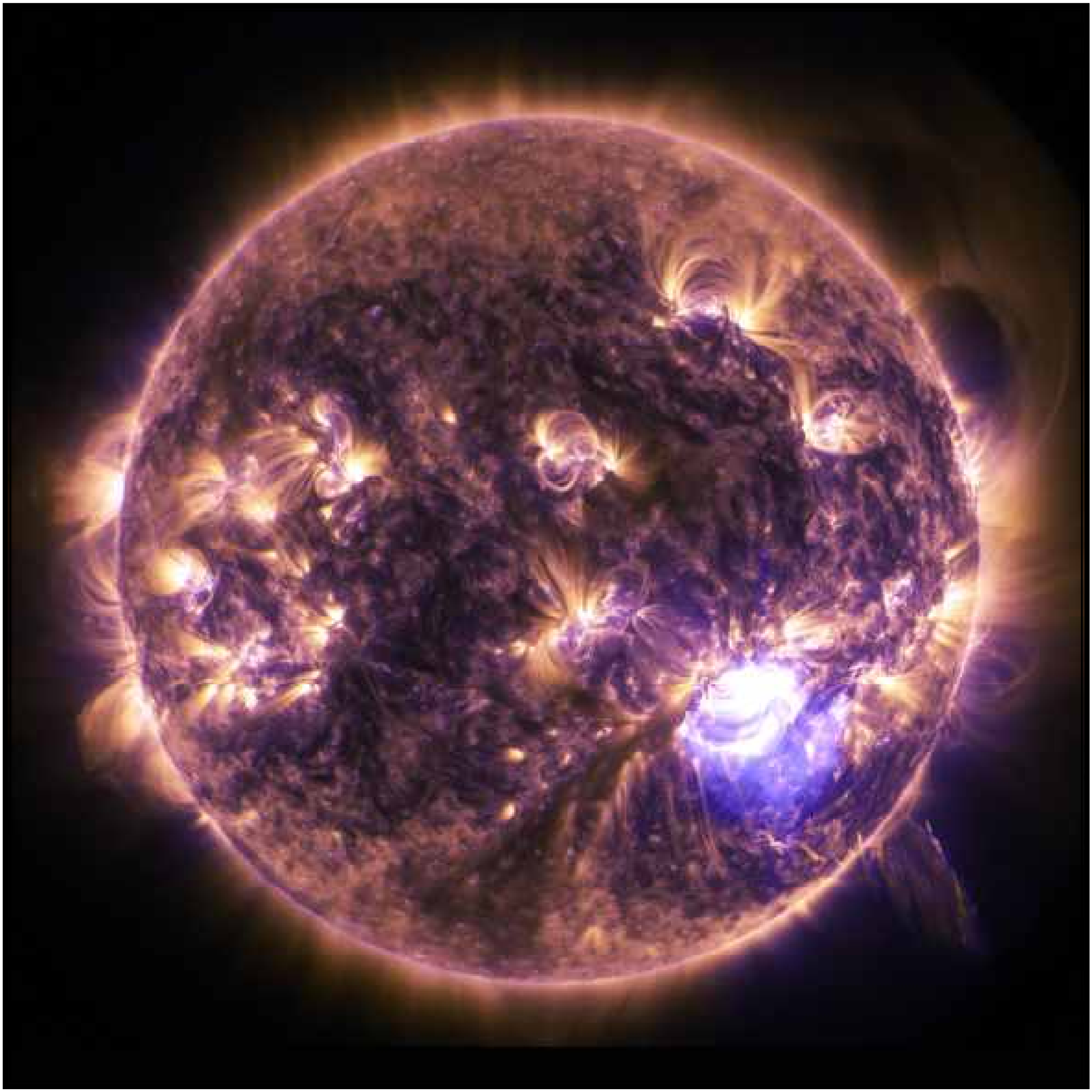
Like a drop of dew hanging on a leaf, Tethys appears to be stuck to the A and F rings from this perspective. Tethys (660 miles, or 1,062 kilometers across), like the ring particles, is composed primarily of ice. The gap in the A ring through which Tethys is visible is the Keeler gap, which is kept clear by the small moon Daphnis (not visible here).

This view looks toward the Saturn-facing hemisphere of Tethys. North on Tethys is up and rotated 43 degrees to the right. The image was taken in visible light with the Cassini spacecraft narrow-angle camera on July 14, 2014. The view was acquired at a distance of approximately 1.1 million miles (1.8 million kilometers) from Tethys and at a Sun-Tethys-spacecraft, or phase, angle of 22 degrees. Image scale is 7 miles (11 kilometers) per pixel.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington, D.C. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging operations center is based at the Space Science Institute in Boulder, Colorado.

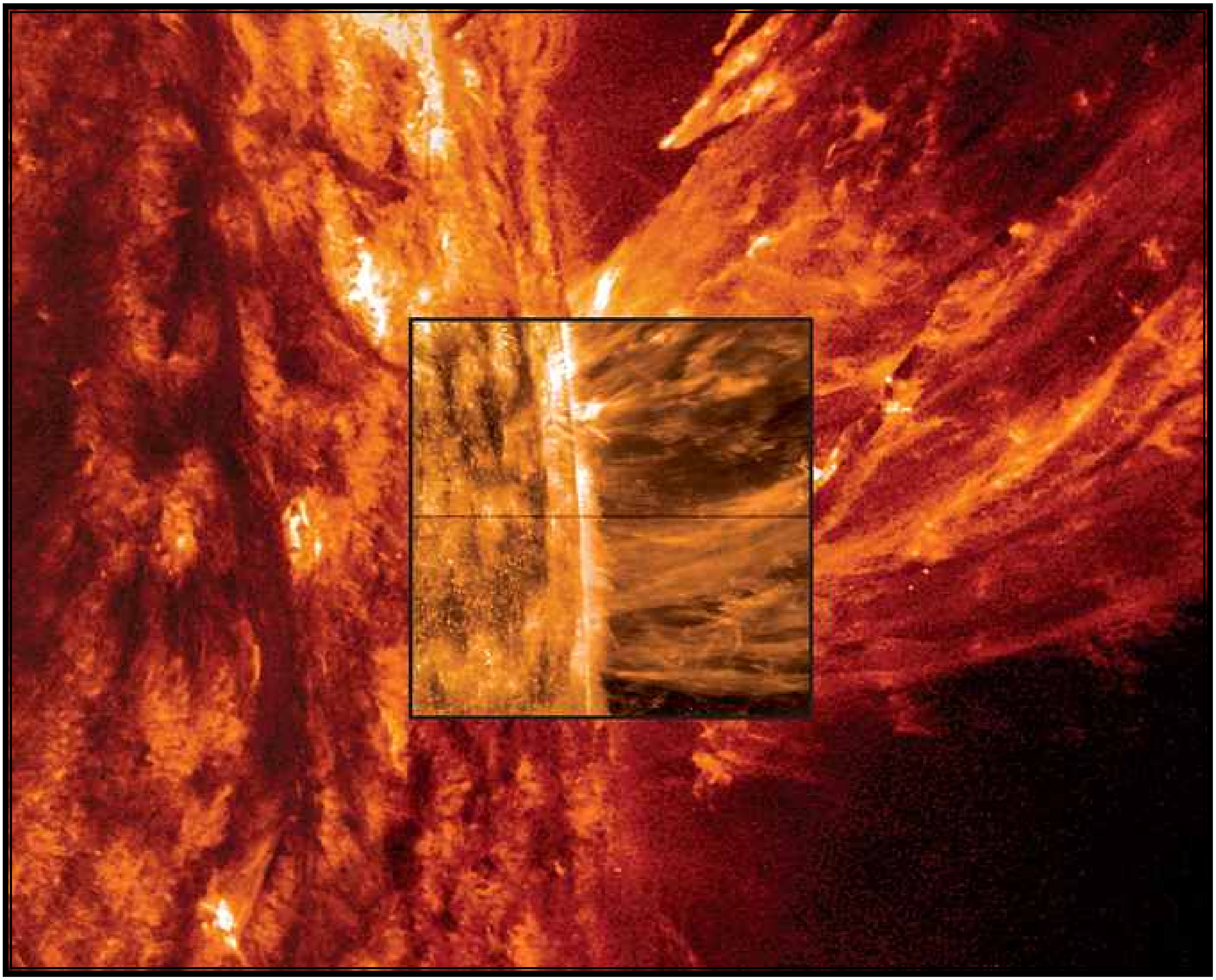
Credit: NASA/JPL-Caltech/Space Science Institute

Holiday Lights on the Sun



The sun emitted a significant solar flare, peaking at 7:28 p.m. EST on Dec. 19, 2014. NASA's Solar Dynamics Observatory, which watches the sun constantly, captured an image of the event. Solar flares are powerful bursts of radiation. Harmful radiation from a flare cannot pass through Earth's atmosphere to physically affect humans on the ground, however -- when intense enough -- they can disturb the atmosphere in the layer where GPS and communications signals travel. This flare is classified as an X1.8-class flare. X-class denotes the most intense flares, while the number provides more information about its strength. An X2 is twice as intense as an X1, an X3 is three times as intense, etc. *Image Credit: NASA/SDO*

NASA Spacecraft Provides New Information About Sun's Atmosphere



NASA’s Solar Dynamics Observatory provided the outer image of a coronal mass ejection on May 9, 2014. The IRIS spacecraft. The IRIS mission views the interface region that lies between the sun’s photosphere and corona in unprecedented detail for researchers to study.
Image Credit: NASA, Lockheed Martin Solar & Astrophysics Laboratory

NASA's Interface Region Imaging Spectrograph (IRIS) has provided scientists with five new findings into how the sun’s atmosphere, or corona, is heated far hotter than its surface, what causes the sun’s constant outflow of particles called the solar wind, and what mechanisms accelerate particles that power solar flares.

The new information will help researchers better understand how our nearest star transfers energy through its atmosphere and track the dynamic solar activity that can impact technological infrastructure in space and on Earth. Details of the findings appear in the current edition of Science.

"These findings reveal a region of the sun more complicated than previously thought," said Jeff Newmark, interim director for the Heliophysics Division at NASA Headquarters in Washington. "Combining IRIS data with observations from other Heliophysics missions is enabling breakthroughs in our understanding of the sun and its interactions with the solar system."

The first result identified heat pockets of 200,000 degrees Fahrenheit, lower in the solar atmosphere than ever observed by previous spacecraft. Scientists refer to the pockets as solar heat bombs because of the amount of energy they release in such a short time. Identifying such sources of unexpected heat can offer deeper understanding of the heating mechanisms throughout the solar atmosphere.

For its second finding, IRIS observed numerous, small, low lying loops of solar material in the interface region for the first time. The unprecedented resolution provided by IRIS will enable scientists to better understand how the solar atmosphere is energized.

A surprise to researchers was the third finding of IRIS observations showing structures resembling mini-tornadoes occurring in solar active regions for the first time. These tornadoes move at speeds as fast as 12 miles per second and are scattered throughout the chromosphere, or the layer of the sun in the interface region just above the surface. These tornados provide a mechanism for transferring energy to power the million-degree temperatures in the corona.

Another finding uncovers evidence of high-speed jets at the root of the solar wind. The jets are fountains of plasma that shoot out of coronal holes, areas of less dense material in the solar atmosphere and are typically thought to be a source of the solar wind.

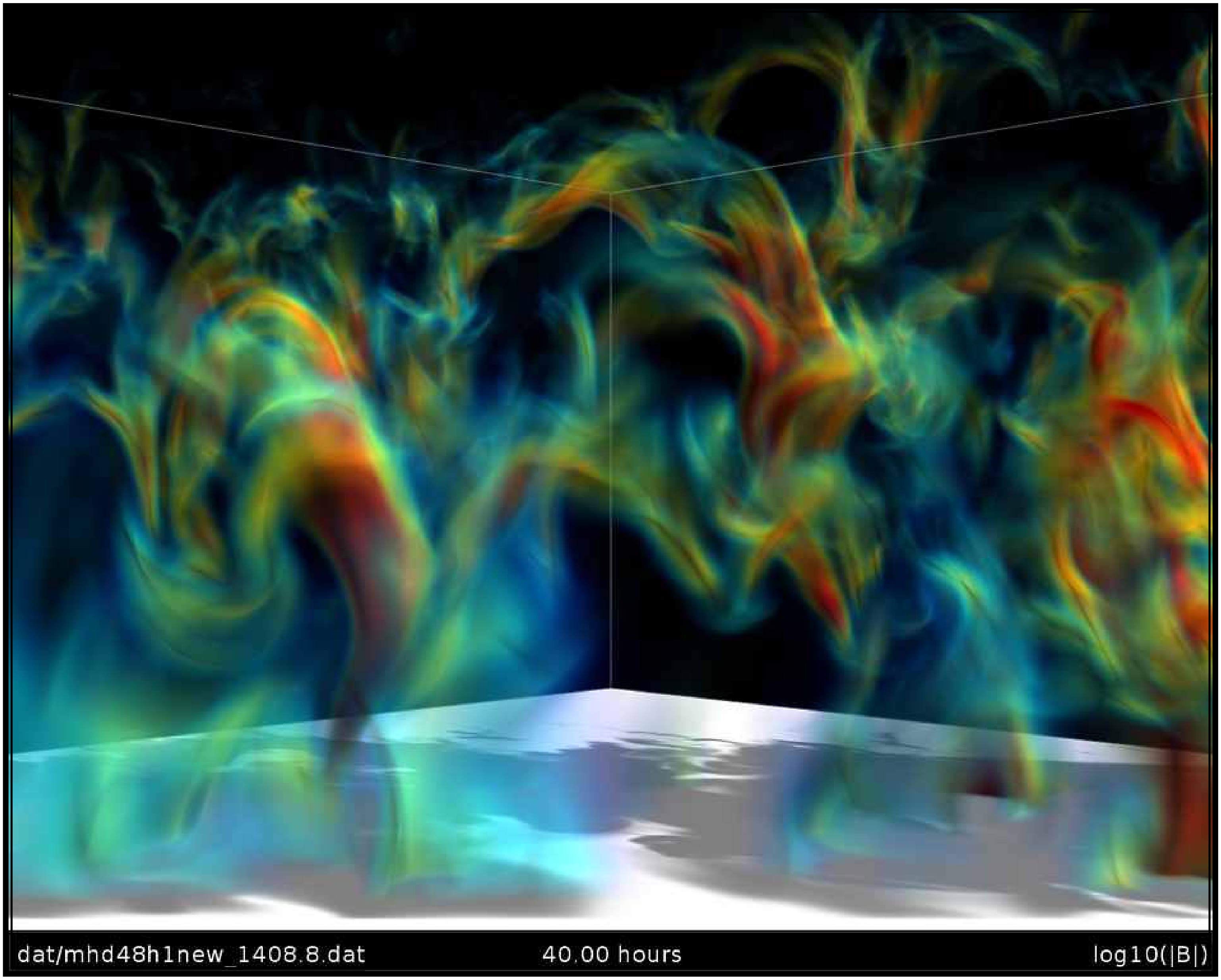
The final result highlights the effects of nanoflares throughout the corona. Large solar flares are initiated by a mechanism called magnetic reconnection, whereby magnetic field lines cross and explosively realign. These often send particles out into space at nearly the speed of light. Nanoflares are smaller versions that have long been thought to drive coronal heating. IRIS observations show high energy particles generated by individual nanoflare events impacting the chromosphere for the first time.

"This research really delivers on the promise of IRIS, which has been looking at a region of the sun with a level of detail that has never been done before," said De Pontieu, IRIS science lead at Lockheed Martin in Palo Alto, California. "The results focus on a lot of things that have been puzzling for a long time and they also offer some complete surprises."

IRIS is a Small Explorer mission managed by NASA's Goddard Space Flight Center, in Greenbelt, Maryland for the agency's Science Mission Directorate at NASA Headquarters. NASA's Ames Research Center in Moffett Field, California, provides mission operations and ground data systems. The Norwegian Space Centre is providing regular downlinks of science data. Lockheed Martin designed the IRIS observatory and manages the mission for NASA. The Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, built the telescope. Montana State University in Bozeman designed the spectrograph. Other contributors for this mission include the University of Oslo and Stanford University in Stanford, California.

For more information about IRIS, visit: http://www.nasa.gov/iris

Supercomputer Simulation of Magnetic Field Loops on the Sun



Magnetic fields emerging from below the surface of the sun influence the solar wind—a stream of particles that blows continuously from the sun's atmosphere through the solar system. Researchers at NASA and its university partners are using high-fidelity computer simulations to learn how these magnetic fields emerge, heat the sun's outer atmosphere and produce sunspots and flares.

This visualization shows magnetic field loops in a portion of the sun, with colors representing magnetic field strength from weak (blue) to strong (red). The simulation was run on the Pleiades supercomputer at the NASA-Advanced Supercomputing facility at NASA's Ames Research Center in Moffett Field, California.

The knowledge gained through simulation results like this one help researchers better understand the sun, its variations, and its interactions with Earth and the solar system.

Image Credit: Robert Stein, Michigan State University; Timothy Sandstrom, NASA/Ames

Kevin's Comet Corner

Comet Lovejoy

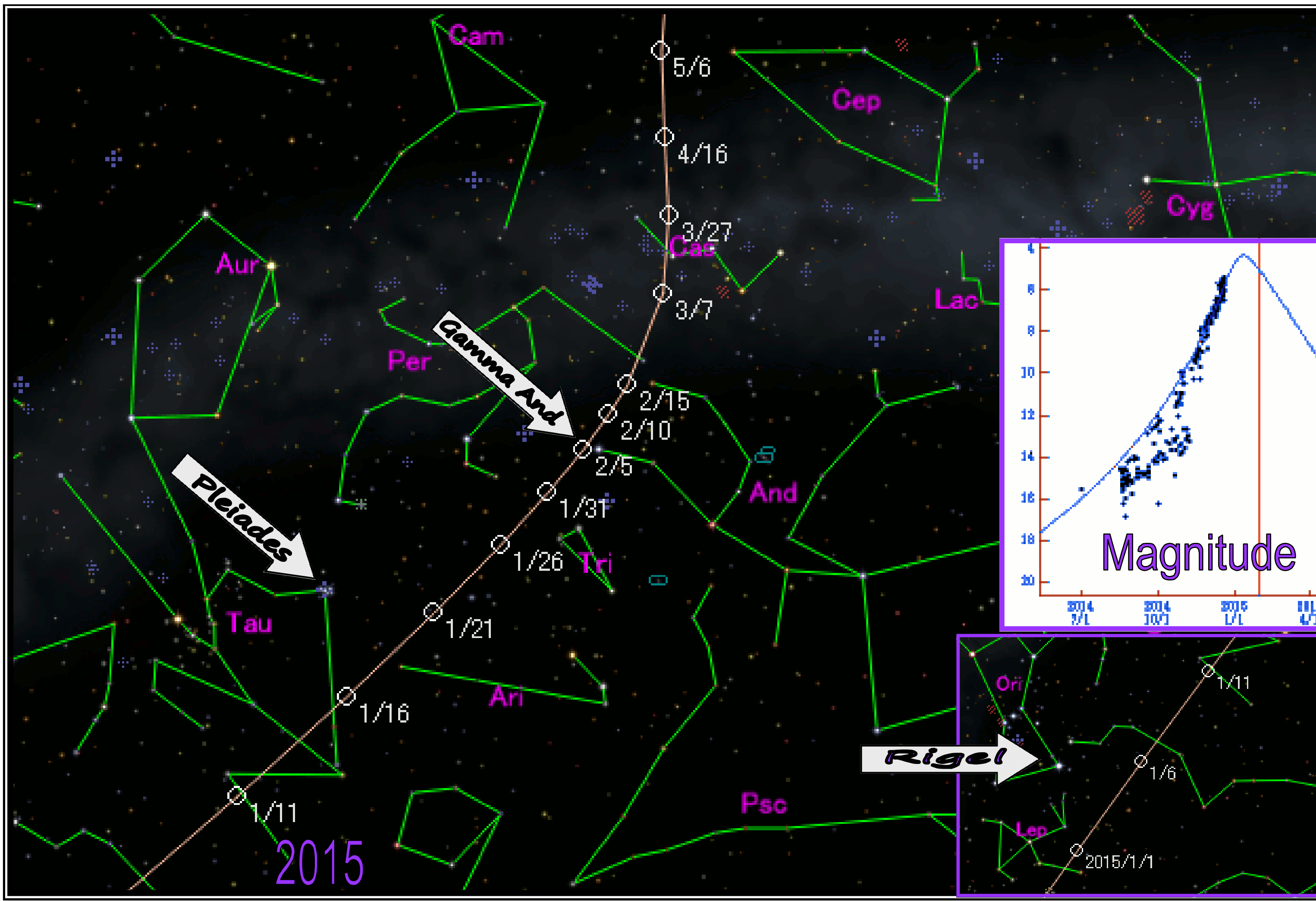
C/2014 Q2 (Lovejoy)

by Kevin Heider

Lovejoy is brightening rapidly, it's currently at 5.6 magnitude and naked eye visible. On January 7th, 2015, the comet will pass 0.469 AU (70,200,000 km; 43,600,000 mi) from Earth. It crosses the celestial equator on January 9th, 2015, located higher in the sky for the northern hemisphere. It should brighten to a maximum of 4th magnitude. Early in January the comet can be found below Rigel, by January 19th it will be near the Pleiades. Sky Safari has it listed under search> comets>C/2014 Q2 (Lovejoy), touch to view the current position.

Credits: Seiichi Yoshida's www.aerith.net

Comet Lovejoy seen on December 19, 2014 by Eric Recurt. Eric was in Tenerife Island, Spain – 28 degrees N. latitude! EarthSky



Cocoon Nebula, Caldwell 19, IC 5146 Near Pi Cygni

by Stuart Schulz

This great photo of the Cocoon Nebula in Cygnus, was taken with the 16” Ritchey Chretien at our observatory. We continue to be impressed with the quality photos produced from this scope. Stuart Schulz decided to photograph this challenging object, we just couldn’t see it in the Ritchey. The SiTech go to system has been working really great, so we trusted it to take us to the right spot. We let the computer compile an image, but no nebula? Using Sky Safari, we zoomed in way up close and started a search pattern for the invisible object. After each move we took a photo of the area, and after the second try we were rewarded with the Cocoon Nebula on the screen. I say “we” because I was looking over Stuarts shoulder, trying my best to get in the way and learn something about astrophotography.

SVAS Observer Editor

Seyfert Galaxy,NGC 1566 in Dorado

This new Hubble image shows NGC 1566, a beautiful galaxy located approximately 40 million light-years away in the constellation of Dorado (The Dolphinfish). NGC 1566 is an intermediate spiral galaxy, meaning that while it does not have a well-defined bar-shaped region of stars at its center — like barred spirals — it is not quite an unbarred spiral either.

The small but extremely bright nucleus of NGC 1566 is clearly visible in this image, a telltale sign of its membership of the Seyfert class of galaxies. The centers of such galaxies are very active and luminous, emitting strong bursts of radiation and potentially harboring super massive black holes that are many millions of times the mass of the sun.

NGC 1566 is not just any Seyfert galaxy; it is the second brightest Seyfert galaxy known. It is also the brightest and most dominant member of the Dorado Group, a loose concentration of galaxies that together comprise one of the richest galaxy groups of the southern hemisphere. This image highlights the beauty and awe-inspiring nature of this unique galaxy group, with NGC 1566 glittering and glowing, its bright nucleus framed by swirling and symmetrical lavender arms.

This image was taken by Hubble's Wide Field Camera 3 (WFC3) in the near-infrared part of the spectrum. A version of the image was entered into the Hubble's Hidden Treasures image processing competition by Flickr user Det58.

Image Credit: ESA/Hubble & NASA, Acknowledgement: Flickr user Det58

Seyfert galaxies are one of the two largest groups of active galaxies along with quasars. They have quasar-like nuclei (very luminous, distant and bright sources of electromagnetic radiation) with very high surface brightness whose spectra reveal strong, high-ionization emission lines , but unlike quasars, their host galaxies are clearly detectable. Seyfert galaxies account for about 10% of all galaxies and are some of the most intensely studied objects in astronomy, as they are thought to be powered by the same phenomena that occur in quasars, although they are closer and less luminous than quasars. These galaxies have super massive black holes at their centers which are surrounded by accretion discs of in-falling material. The accretion discs are believed to be the source of the observed ultraviolet radiation. Source Wikipedia

For $ale

Meade 10" f4/5 Newtonian Scope for sale.

Completely gone through and modified to make it easier and safer to use. The feet now have leveling adjusters and the drive motor has an on/off switch. The bands that secure the tube assembly are trapped so they can't come off. Both RA and Dec pivots were cleaned and greased, the drive clutch was cleaned and adjusted. The optic's are typical high quality Meade. The original 1.25 plastic focuser has been replaced with a metal 2" Orion with a 1.25" adapter. The mirror's were cleaned and collimated. The scope comes with two eyepieces, a 1.25/15mm Kellner and a 40mm Scopetronix Maxview 2". A Stellarvue 8x50 right angle correct view finder that accepts 17 to 40mm eyepieces, and a Telrad are included. Designed for visual observations, it works fine with today's fast rate imagers (with careful polar alignment) and quite well with Orion's Deep Space Video Camera. Asking $1000,00. Contact Tim Tingey

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Where We Meet

General Meetings the third Friday of each month beginning at 8:00pm. **Board Meetings** begin at 6:30 on the same day. All members are welcome. **Star Parties** on weekends nearest the new Moon.

Sacramento City College
Mohr Hall Room 3
3835 Freeport Boulevard
Sacramento, CA.

WWW.SVAS.ORG

SVAS Observer - Newsletter

To Subscribe– First send in your membership application form below, with your dues, and upon approval by the Board of Directors the Observer newsletter (published bi-monthly beginning January) will be sent to your supplied email address in .pdf format. Second, request to join the SVAS Yahoo Group at http://groups-yahoo.com/group/svas-members. This group will keep you informed with the day to day current events and discussions.

Articles– Manuscripts and letters are welcome in MS Word, MS Publisher, or plain text format, and emailed to the SVAS Editor. Submission deadline is the 15th of the newsletter release month.

Advertising– Commercial, non-personal advertising, business card, and full page are available. Classified advertising is free to SVAS members.

SVAS Membership Application

Date___/ ___ /___ **Membership** (check one): New: ___ or Renew:___

Number of months until & including June # months________
(If # months less than 4 include the following 12, annual renewal is July 1st)

Family/ Individual Multiply # of months by $3 per month________

Observatory (Please read requirements) Additional $4 per month________

Student (student ID required) Multiply by $2 per month________

Additional tax deductible contribution Amt $ ________
Total Amount$________

Name____

Address____

City ______________________ Zip__________ (Please Print)

Phone____________________ (Email for newsletter mailing)

Email____

Detach, ***SIGN***, and mail with payment to:
SVAS Membership Application
PO Box 15274
Sacramento, California. 95851-0274

Note: It may take the SVAS Board of Directors 30 or more days to process and approve this application.

By signing this application, I acknowledge I have accessed the SVAS website **SVAS.org**, read and understand the SVAS bylaws and the rules governing the USFS Special Use Permit. In doing so, I agree to abide by the respective "terms and conditions" of each as they relate to the SVAS, use of its property and its facilities. I further understand and acknowledge that failure to abide by these "terms and conditions" can result in revocation of use privileges and/or SVAS membership.

Signature Required!

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★★★ Date___/ ___ /___

Observatory Membership Approvals

The benefits of a regular membership plus private use of the Henry Grieb Observatory (HGO) at Blue Canyon. You must be a regular member for six months or longer, be certified and approved by the Observatory Director, and then be approved by the SVAS Board of Directors.