

Star Gazer News

*Astronomy News for Bluewater Stargazers
Special Issue: Jul 2012*

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President's Report: Transit of Venus

I didn't arrive at the observatory until about 5:30 PM so I had a bit of a scramble to setup the telescope I intended to use in time. Everything went together well although my rough polar alignment turned out to be very rough requiring frequent re-centering of the Sun during the event.

I chose 90x to get a fairly large Sun image in the eyepiece. At that power atmospheric unsteadiness was fairly pronounced but the magnification was worth it as sunspot detail snapped into focus frequently. Another effect of more magnification was that the roiling of the air was quite pronounced especially around the Sun's edges. To me this actually served to give a heightened sense of energy to the images.

Thanks to John's countdown I was able to see first contact when it happened. I had realized as the moment was imminent that it might have been a good idea to figure out where on the Sun I should be staring to see Venus! This is something that would have been easy enough to figure out in advance but in all the rush to get there it hadn't occurred to me! Fortunately it worked out well and I didn't miss the beginning by very much. Actually if I recall I may have been the first to call out "First Contact!"

As we anticipated the "Second Contact" I thought to look for the appearance of Venus' atmosphere glowing visibly on the side of the planet that had not yet crossed into the Sun. I was first able to observe this after the midway point between first and second contact. It was a bit difficult to observe due in part to the atmospheric unsteadiness and also it is a fairly low contrast detail...but there it was popping in and out of visibility, a faint line of light following the planets disk in the darkness! This observation reminded me of the challenge of observing Mar's polar cap this spring...it was a "there it is, there it isn't" kind of thing. You have to know what you are looking for and concentrate on the location while patiently waiting for moments of stillness in the air.

The next thing to look for was the full entry of Venus into the Sun's disk or "second contact". At the same time many of us were keeping our eyes "peeled" for the "drop" effect. As second contact came and went I observed the "drop" effect off and on over several minutes. Due to the atmospheric turbulence the effect changed or popped in and out of view with the seeing.

I was very impressed with "naked eye" views of the event. The solar glasses included with Sky News magazine gave the image of a nice yellow Sun on a dark field. This contrast made finding Venus much easier for me. It was well past second contact before I was successful finding the planets "dot" on the Sun. The fact that I could see this detail without optical aid impressed me greatly.

The relaxed pace of most of our transit event was quite pleasant and we couldn't have had a nicer day to enjoy it together. I personally haven't participated in a BAS event that went off so well and worked on so many levels. I'm sure that we'll all remember that Tuesday for some time to come as a very special day.

Transit of Venus Special Edition

This Special Edition of Stargazer News provides coverage of the June 5, 2012 Transit of Venus as seen by observers from the Bluewater area. Images in this souvenir edition were provided by members of the BAS and others who viewed with the BAS team at the ES Fox Observatory. Thank you to all who sent in reports and images to make this keepsake edition of SGN possible.

Image above: Second Contact? by J.Hlynialuk, Canon 50D at prime focus of C-8. Effective focal length 3200 mm, f/10, ISO 200, exp = 1/180 s. taken at 6:22:03 DST

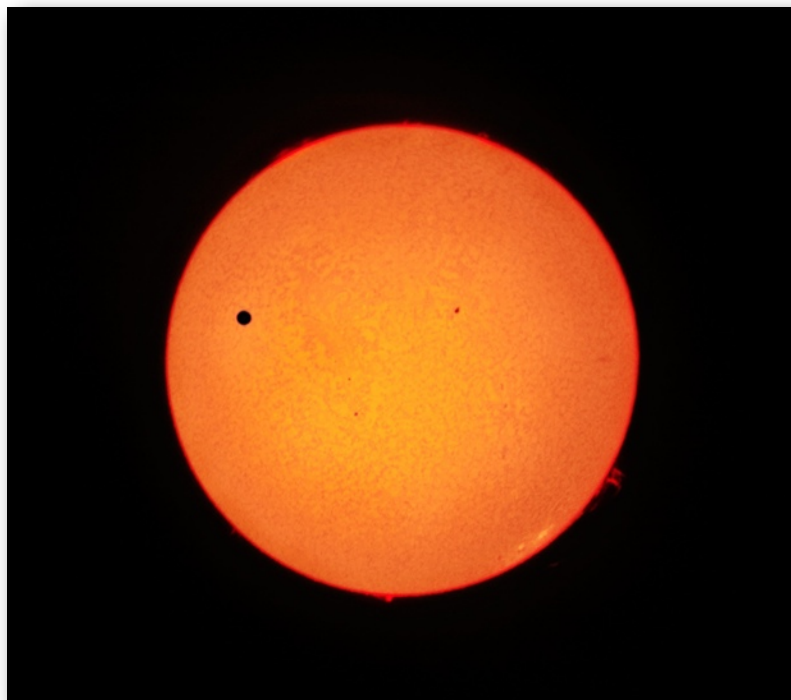
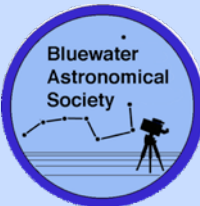


Image above: Steve Irvine observed and recorded the transit from Big Bay on the shore of Georgian Bay. This image was made through his H-alpha solar telescope. No details of the image are available at this point.

Disclaimer: StarGazer News reports the activities of the Bluewater Astronomical Society (formerly Bruce County Astronomical Society) but any opinions presented herein are not necessarily endorsed by BAS. See the BAS website at www.bluewaterastronomy.info for up-to-date details relating to BAS events. The BAS "blog" is temporarily not available. StarGazer News is produced and edited by John Hlynialuk. I am solely responsible for its content. Your original articles, images, opinions, comments, observing reports, etc., are welcome. I reserve the right to edit for brevity or clarity. Errors or omissions are entirely mine although I strive for accuracy in star events, etc. I will not publish your emails or other materials without your specific permission to do so. No part of this publication may be reproduced in any form whatsoever without the editor's consent. However, the Sky Calendar and Feature Constellation pages are free for you to copy. Feel free to forward this issue in its entirety to your friends. Email comments or submissions to stargazer@wightman.ca



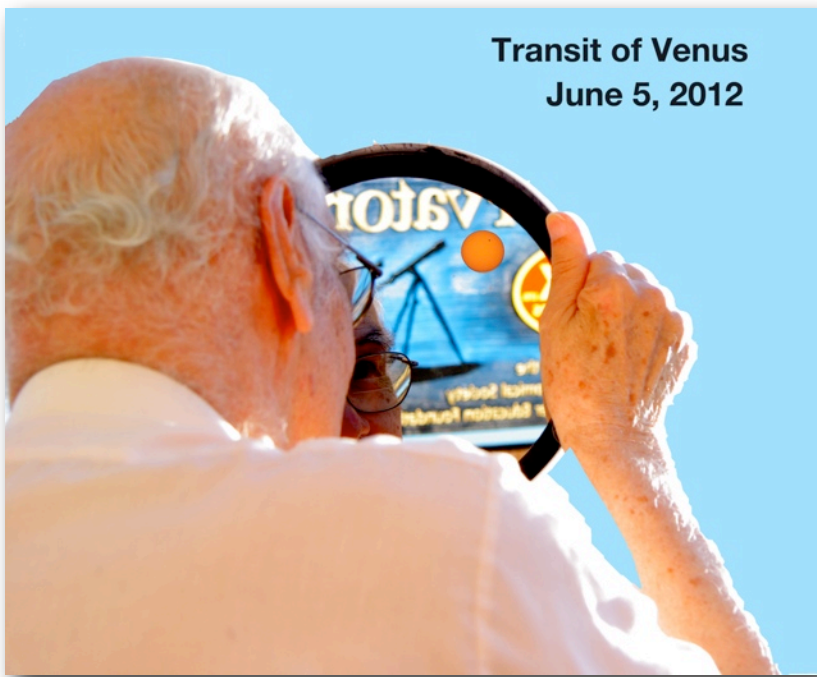
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The Bluewater Education Foundation

BAS Members View Transit at ES Fox



Watching the Transit from ES Fox

In this posed image, we have Robert Williamson looking at the transit through a 1000 Oaks filter, -the one used on the C-8 for some of the other images in this issue. The backwards reflection is the ES Fox sign on the west wall of the observatory and I used Photoshop to add an enlarged image of the Sun with Venus on it taken 8:38 pm DST. In fact there was a much smaller real solar image on another attempt of this shot but the edge of Robert's right hand is covering it in this one. The blue sky is compliments of Photoshop as well but only to enhance the clear sky we had. Photo by John H.

BAS members "watching"??? the Transit

Most of the folks in this image are current BAS members and they are clearly taking a break from transit observing. In sun glasses we have Brett Tatton, having a discussion with Ulla Conrad (on Brett's right) and Doc Amy in her red chair. In the black T-shirt and head band is Cheryl Dawson and below her is Lorraine Rogers(seated). Behind the refractor is Peter Harris and hidden is the scope's owner Aaron Top. This group was about a quarter of the BAS members that came to the Fox to observe. Photo by Allan Ramsay.





H-alpha Viewing

Eric Ingard shows an H-alpha view of the sun to a youngster who made the rounds of telescopes more than once. He was at the eyepiece of my 4-inch refractor at least four times over the two hours or so I had it set up for viewing, -always with a big smile on his face. Photo by Allan Ramsey.

Jake Gets a View of Transit

Jake, the dog, was included in the transit observations with his own pair of transit spectacles. Our outreach chair Joan was able to get 250 pairs from RASC for free and we distributed about half at the solar eclipse May 20 and the other half at the transit. There was no charge but folks gave donations anyway and we were able to add a nice amount to the BAS treasury.

Incidentally, if Jake survives into his old age, another 15 years lets say, he may be the only one who will see the 2117 transit (in dog years). Go ahead work it out.. $15 \times 7 = ???!$!)

Photo by Martie Barth



One metre diameter Solar Image:

This 1m+ solar image was projected onto the screen in the observatory using a B&W video camera (one similar to an early Mallincam) that was mounted on the club H-alpha scope. The signal was input to an LCD projector via a standard RCA jack on the back, -a simple solution to making the transit accessible to a large audience. There were even prominences visible. Now to just make the image the right colour. Image by Lyle Jenkins





Med students take in transit: Four medical students arrived with Dr. and Gena Van Dorp to take in the transit. These students were being hosted by the Van Dorps as part of the local recruiting effort. Gena is a member of the Physician Recruitment Committee for the Warton area that was successful in recruiting Dr. Nelvia Van Dorp in 2009. (Yes, they are related).

When Was First Contact?

I did not do much in the way of timings during the 2004 transit so this time, I wanted to make sure that I got as accurate a time as I could for first contact. I wanted to experience first hand the difficulties with transit timings as experienced by early astronomers. I knew that visual detection would be impossible especially with the crowd expected on transit day. My solution was to use my 1970's vintage C-8 with a modern digital SLR at prime focus and start a sequence of images every five seconds using a Canon auto-timer. I figured that by looking at the images later I could get an accuracy of +/- 2.5 s or so and I could also put the sequence together into a movie. The system worked like clock-work, literally!

Checking the time of the first image on which a tiny notch of Venus was visible gave a time of 6:04:43 pm DST (after correcting for a 1 min, 43 second error in my camera clock). This time could have been out by one or even two frames so first contact could have been as early as 6:04:33 DST.

One reference time I got from a reliable source gave 6:04:23 DST as the predicted 1st contact, a full 10 seconds earlier! You can see how tough it would have been for astronomers doing a visual measurement to get a time accurate enough for their purposes especially with the lower optical quality of the telescopes of the day. They were looking for an accuracy of 1 second or so and actually got errors of about 1 minute! Personally, I doubt I could have noted the time visually when the first notch appeared to an accuracy of 20 seconds even with 21st century optical equipment.

And the Black Drop effect makes the second contact timing even more error-prone. Some bit of darkness between the planet and the limb of the sun was visible over about 30 frames, or about 2.5 minutes! Even if we cut that in half, it is still too large a difference to give a useful value for purposes of calculation. No wonder the early astronomers were frustrated!



Transit Attracts Celebrities
Several "famous" visitors made it to the ES Fox Observatory to watch the transit. These included an Owen Sound councillor and family, two well-known (and famous) local photographers and even a Rogers TV host. Shown here is Diane Foulds, co-host of Grey County Life program on Rogers TV. The astronomy activities of BAS have been featured on a number of segments on Grey County Life in the past and will hopefully continue to appear periodically.

WOW ! What amazing energy from so many people who came out to enjoy the planet Venus as it transited the sun's disc, an event that will not repeat itself for 105 years. For me this was something I never imagined I would ever see as I was growing up. But Venus, over the past eight months, came from around the sun and put on a spectacular display as an evening star. Then it plummeted towards the sun and appeared to vanish in the sky as it got ready to transit across the sun. This just boggles my mind! I am truly left speechless!

With the exception of those who saw the 2004 transit, I and many others had never witnessed a transit before. I really didn't know how to take in the sheer excitement.. should I cheer, smile, shout "WOW!" All of these and laughter are what made this "once in a lifetime" event so special, -a sort of connection with Venus so to speak. It brought a calm harmony and peace among everyone and was one of "those moments where nothing else seems to matter in the world". One single event that appears to make the world and time stop! This is one "once in a life time" that I will never forget!

As for the first contact, let it be noted that Cheryl who was beside me with her Coronado solar scope was the first one to yell out the start of transit. I quickly snapped a bunch of shots through my telescope and then I had to have a peek through the Coronado, WOW! it was there on time, amazing! Cheers Everyone!

Aaron Top

The Black Drop:

This image taken by Aaron Top shows the Black Drop Effect very well. The gap between the sun's limb and the silhouette of Venus is clearly not sharp and the planet is not totally detached from the sun. A dark band still is visible in between. The uncertainty in the actual time of second contact is considerable, perhaps as much as several minutes. Based on the camera data, Aaron's camera clock indicates the photo was taken at 6:27 DST but no time correction was made.



Transit at Sunset: Weird or What?

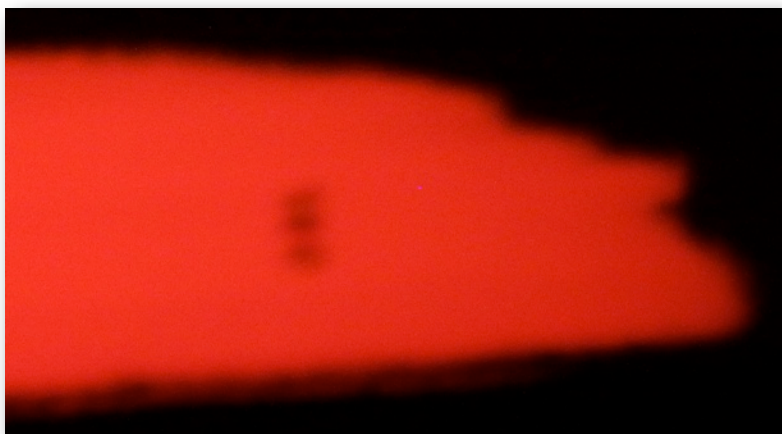
Both the May 20 solar eclipse and this transit involved observing the sun setting, so both events were good opportunities to not only watch the atmosphere distort the image as the sun dropped but also to spot the green flash at the moment of the sun's disappearance. But even if the GF did not make an unambiguous appearance either time, the antics of the air at the horizon made both sunsets interesting. The images on this page illustrate. The top three images on this page were taken at ISO 1250 with exposures of about 1/10 s with the solar filter still in place.



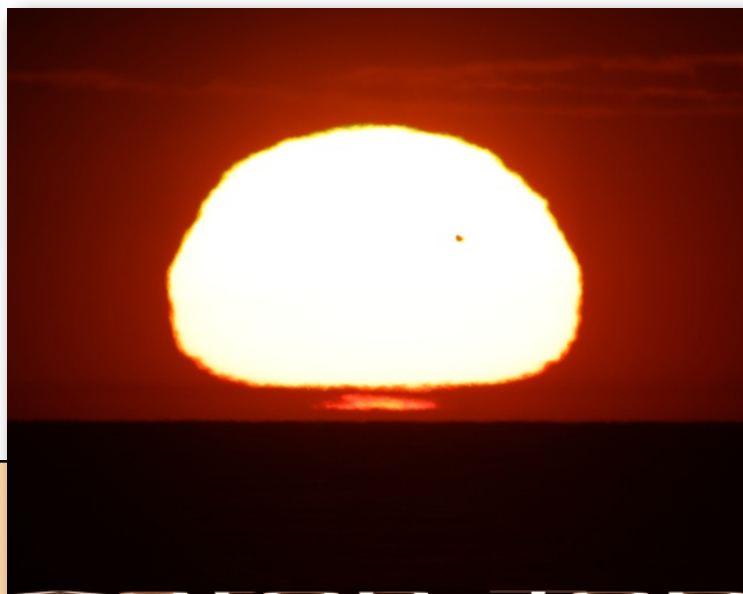
The sun is still over 3/4 of a degree above the horizon (8:58:01 DST) when this image was taken. There were fewer cloud layers near the horizon that for the solar eclipse May 20, but the atmosphere was considerably more layered. As the sun dropped there was a lot of distortion. There were even one or two frames that showed Venus as a double dot when it was split by colder/warmer layers of air, -a remarkable example of "lensing" not of the of the gravitational kind as happens for galaxies but of the optical variety. After I looked closer, I noticed there was one image which showed not two but three images



The Sun Turns Turtle: Atmospheric distortion has turned the sun into flattened disk looking a bit like the head of a turtle. That darker line was responsible a few minutes later for splitting the image of Venus into two and then three dots as seen in the image at left. Time of the above image was 9:05:27 DST



A Triple Venus: This image taken at 9:06:11 DST shows Venus split into **three** images by the refraction of different temperature layers of air. There are several other images before and after this time that show a double Venus, -remarkable in its own right, but to get three was a complete surprise!



Above: Hydrogen Fireball This image taken by Aaron Top just as the sun touched the horizon at about 9 pm DST shows Venus sharply delineated against the sun. It is reminiscent of the H-bomb images from the era of the cold war. Image data: Canon 50D mounted on Celestron Omni XLT 120 (5-inch refractor of 1000 mm focal length). Exposure = 1/8000 s ISO 100 at f/8.3

More Aaron Top Images show the changing shape of the sun as it's light passes through the



refracting layers of Earth's atmosphere. No wonder the Lake Huron shore is famous for its sunsets!

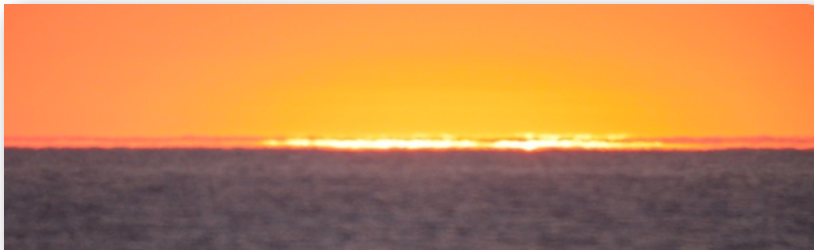
Editor's Report

There are not a lot of images of yours truly in the 6 years of SGN that I have edited. There are lots of my astronomy images that I have shared with readers but not many showing me, - in profile or otherwise. Here I am watching for the green flash as the last traces of the sun go below the horizon. This is reminiscent of a shot I took of the previous transit in 2004 which showed a silhouette of my C-8 and TV 101 (the same scopes here). Onto the black part of the C-8 in that 2004 image, I photoshopped a shot through the eyepiece showing Venus against the brighter sun surface. I had intended to do something similar this time as well but totally forgot to take the image.

Thanks to Donna Stewart, however, I was able to use her image to re-create something similar to 2004 and "complete the pair" bringing the observations of this remarkable set of events to a close! Note that here, the image of the sun is reversed L/R by the telescope/diagonal combination. I did not flip it in Photoshop. The 2004 image shows it correctly oriented.

Image right: "Watching for the Green Flash" photo by Donna Stewart, with an iPhone 4 at 9:05 pm. Taken at Sauble Beach, camera settings were f/2.8, focal length = 3.9 mm, ISO 80. Image of Venus on Sun taken by me at 8:38 pm DST with Canon 50D on C-8 at prime focus. Exp = 1/125 s, ISO 800.

Green Flash? There was no real obvious green flash although I tried to talk the audience into seeing one as I reviewed images on the camera. (Image below). If it was there, it was smeared out into a line unlike any green flash I have ever seen. Photo below by John H.



Three Musketeers? Lorraine R., Doc Amy, and Ulla C. "practice" using the solar glasses for just the right moment of viewing the transit. They were part of the crowd below that gathered at the Pavilion at the end of 6th St N in Sauble Beach. The weather was remarkable since there were clouds but they stayed away from the sun and allowed a clear view right to the last instant sunlight was visible above the water (Image above).

Lower two photos by Kyla Rodgers.



Photo by Donna Stewart



Hawaii Report

Hi John,
Now, finally some time to reply to your transit query. Hawaii, due to influence of Mauna Kea and Mauna Loa, is a very cloudy place at the lower elevations. However, the higher elevations are another story all together. We landed on Monday, the day before the Transit, and I was disappointed by all the cloud. On Tuesday morning, as Paula and I headed to breakfast, the sky was clear and promised some success. We had a pre-transit talk by Alex Filippenko which was excellent and then we left for the NW part of the Island to get out of the cloud shadow of Mauna Kea. We arrived at the transit site at 11:30 am and had about 40 minutes before first contact. I didn't have a device to aid in finding the sun because I've always used the telescopes shadow. This time because the sun was so high, near zenith, Paula's Pronto wouldn't tip far enough. I removed the telescope handle and tipped the tripod backwards to acquire the image. With all this fussing around I managed to center the Sun a few minutes before first contact. Meanwhile, Paula was reclining on the lava rocks, cushioned by her beach towel, and was observing the Sun with her 12x36 Canon IS binoculars. Over all, we managed to see contacts 1, 2, mid transit and events throughout the event and also saw 4th contact and the minutes prior to that. A horizon cloud obscured 3rd contact but really, before we came I didn't think our chances for the 3rd and 4th contacts would be all that good due to ocean horizon clouds. So, as it was, we saw everything up to 3rd contact. Then, even though a cloud intervened, a hole in the cloud allowed us to see events up to 4th contact and follow the passage of Venus off the disk.

Doug and Paula Cunningham

Peterborough Report

Hi John,
Cory and I were visiting our youngest son and his wife (Crystal) on June 5th in Peterborough. I took our small 3 inch reflector and Crystal, Cory and I rushed up to Armory Hill in Peterborough and got set up at 6:04 pm, just in time to see the start of the transit. The Peterborough amateur astronomy club was set up adjacent to us on a concrete raised platform and a fellow by the name of Dave Dennis had his 32 year old 8 inch Meade set up beside us. I also put some mylar sheeting (Baader solar filter) over a good pair of binoculars. The binoculars provided the best seeing of all. We had a fair number of adults and kids come around for a look so it was an enjoyable time (we do like to show folks the heavens). We had fair seeing for about an hour as the sun went in and out of the clouds but then it completely clouded over and the rain came down. We were glad that we didn't miss at least some of the transit. I've attached a few pictures from the Peterborough outing.

A footnote: on Armory Hill I noticed a boy of around age 10 and his mother busy setting up a "Sears" refractor and the more I watched, the more I was concerned. I finally couldn't stand it because they were about to have a look so I went over and asked if there was a sun filter on the scope. Nope. I explained about blinding oneself looking at the sun without a filter and, luckily, I had a piece of mylar filter that I had purchased from you handy and taped it over the telescope aperture. They were thrilled (and abashed that they didn't know about the sun filter). So.....despite all the warnings about looking at the sun without a filter, there is always someone who doesn't read the warnings!

Warmest regards, **Cory and Murray**

Kincardine Report

From: Paul Zelichowski

Hi John

I set up a 120mm refractor with a Baader filter in my backyard and shared the view with 8 friends. Watched 1st and 2nd contact (with a couple false starts..is that it?...no.....) and then people started showing up. I also watched APOD's update from the SDO satellite on the computer.

After the trees killed my view, I went to the beach to watch the sun set. I was also using my trusty Sky News solar glasses throughout the event. Once the sun hit the horizon, it turned into a rectangle and presented some pretty weird shapes for a sun. At one point the sun looked like the outline of a military tank! An enjoyable event.

Ski

Alberta Report

from **Troy Johnstone** <http://www.troyandnaomi.com/>

I had been waiting since the last transit of Venus back in 2004 to see this rare sight again, and it looked like I was going to miss it entirely. A transit of Venus, superseded by a transit of clouds.

Just as we were sitting down for supper, I realized that there was a beam of light coming in the window, so I jumped up, grabbed my camera and solar filter and ran out the door. It was only a small "sucker hole" in the clouds, but I was thankful for at least a glimpse of Venus crossing the disk of the sun.

I set up the telescope and tripod for the camera and prayed for some more clearings so that the family and I could get a good look. After wolfing down my food, I headed back outside, and was treated again to some thinning clouds now and then. Naomi and the kids took turns looking through my pieces of welding glass and telescope.

Finally, the sky opened up for a few brief moments and we even saw some blue sky, giving us a long look at this rare event. I don't plan to be here for the next viewing in 2117.



When we had a truly clear shot of the sun, you could easily see the sunspots along with the spot of Venus. Thank you, Lord, for an answered prayer for a glimpse of your marvelous creation.

Troy



Armory Hill in Peterborough was the site where Murray and Cory McQuigge set up to watch the transit. Murray should have a halo over his head in this image. The footnote opposite explains. Photo by Cory McQuigge

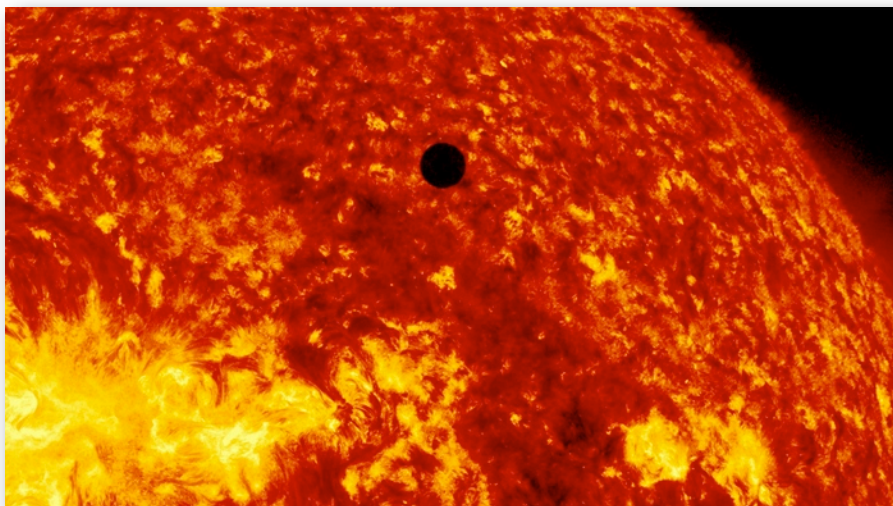
NASA Records Transit from its Fleet of Satellites



Transit From ISS

Earth's planetary neighbor Venus passes across the face of the sun on June 5, 2012, seen here from the International Space Station. Expedition 31 crew members aboard the orbital outpost had cameras set up in several locations to record the rare event.

Image Credit: NASA



SDO's High Def View of 2012 Venus Transit

On June 5-6 2012, SDO is collecting images of one of the rarest predictable solar events: the transit of Venus across the face of the sun. This event happens in pairs eight years apart that are separated from each other by 105 or 121 years. The last transit was in 2004 and the next will not happen until 2117.

This NASA image was captured on June 5, 2012.

Image Credit: NASA/SDO, AIA

Spectacular High Def Video of the 2012 Venus Transit:

Have a look at the video here: It is awesome!

<http://apod.nasa.gov/apod/ap120611.html>

Path of the 2012 Venus Transit

Composite of images taken by SDO June 5, 2012

Image Credit: NASA/SDO, AIA

