Star Gazer News

Solar Eclipse Special Edition
August 21, 2017

Contents

Background Image above is a screen snap from a video made using a Canon 6D in movie mode and a 400 mm telephoto lens. By John H.

BAS Eclipse Chasers Successful!

Kneeling L to R: John Hlynialuk, (Wiarton Echo), Joan Skelton, Krista Bell-Dawson, Cheryl Dawson, Susan MacLachlan, Lorraine Rodgers, Doug Turner. Second row kneeling: Garnet Tettenborn, Matt Hood, Dr. John VanDorp, Gena VanDorp. Standing L to R: Chris Hlynialuk, Eric Ingard, Desna Ingard, Phil Wallace (partially hidden), Tony Wallace, Rob Vollett, Dave Skelton, Mike Tettenborn, Phil Visser. Standing R side: Julian Delf, Frank Williams, Greg Rodgers, Robert Atkinson, Brett Tatton. Missing Liz Certain

A sizeable group of enthusiastic eclipse chasers converged from several directions on Grand Island Nebraska on the weekend prior to the solar eclipse set for Monday Aug 21. No one went home Aug 22 disappointed! It was spectacular!

After downpours overnight Saturday/Sunday and clouds early Monday morning which produced a nice solar halo (pg. 2), cirrus cloud moved in and out to interfere with the partial phases. But at totality, the corona was easily visible to almost its full extent. The diamond rings were thrilling and the sight of the dark moon edge outlined by three groups of prominences was mind-blowing. Once again, the naked eye view encompassed the entire phenomena while our imagers worked hard at recording the different phases of the event. The range of brightness of corona and prominences is so great that cameras cannot record it all in one image. The eye does a much better job of visualizing the whole scene. Still, BAS imagers did a fantastic job of recording all aspects of this grand spectacle.

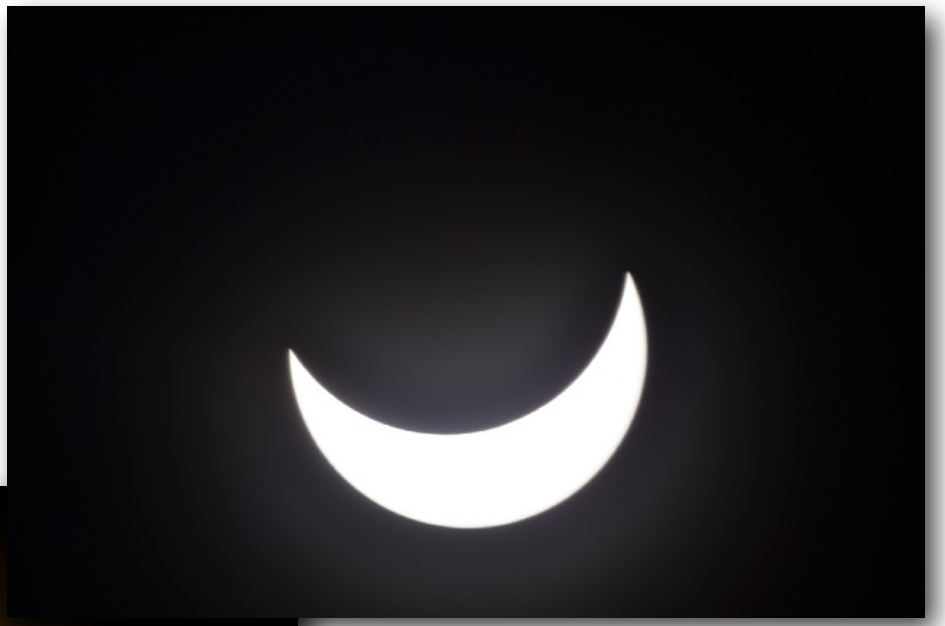
I am dedicating this issue to showing off our BAS photographers' marvellous images. I take my hat off to them because they sacrificed precious seconds of totality manipulating cameras and tweaking focus on their lenses and telescopes. Thanks to their efforts we have many pages of images that we can all enjoy as we recall the special experience that we all shared Monday Aug 21. Thanks to Frank, Julian, Chris, Eric, Lorraine, Robert and Mike, we have a permanent record of this special event. (OK, I took a few pictures too. -ed)

Several of our BAS members watched the solar eclipse from Canada and sent in their observations and images. Contributions from two BAS observers are presented here with their images of the partially eclipsed Sun.

I supplied eclipse glasses for Rebecca and a friend and they watched from our home in Owen Sound. I received several reports of people watching the event with glasses from Foto Art (which BAS supplied) or with home-made viewers like "cereal box" solar projectors from plans on the internet. One report mentioned 40 to 50 observers at the soccer fields in Owen Sound observing the Sun at various times.

Reports are provided here from BAS members **Marian Ratcliffe** and **Ken Pituley**
Thank You!

From Ken P.
John,
Here are two pictures I took on Monday (from my place on Grey Rd 1). One shows maximum coverage (below) the other (above) shows the sunspots. Both were taken with a solar filter on my Meade LS 8, a focal reducer and direct imaging to my Nikon 3100. ***-Ken***



From Marian R.
Keith took the afternoon off on Eclipse Day so we could watch together.

The weather was good, but the skies weren't perfectly clear, there was a thin haze up high and there was intermittent cloud interference. Not enough to spoil the show though. We did notice a visible drop in light levels around the maximum and cooler temperatures.

Please find attached a photo: [Below]

Happy to see from photos that you seemed to have good weather for the trip to see the total eclipse.

Marian

Image left:
Location: *West Grey, just east of Durham in former Glenelg twp.*
Time: *2:21pm*
Camera: *Sony Cyber-shot, held by hand to lens, ISO setting*
Telescope*: 8" (200mm) Newtonian reflector telescope with Baader solar film with DIY holder*
Editing: *the photo was flipped, cropped and colour adjusted in Microsoft Office Picture Manager*
Note: Image left is the way it was oriented to the naked eye. Other images depend on orientation of diagonal, etc.

Digital signs (image right) along Interstate highway I-80 were announcing the solar eclipse (in case you were not aware of it). Following that notice was one that warned of traffic tie-ups possible on Aug 22. They got it wrong by a day, as we had no problems heading east Tuesday morning. However, a fatal accident at 10 am eclipse day near Omaha did tie up I-80 for half a day, at least. I don't think it was not related to the eclipse but it is hard to know.

Image above: Cheryl D. and Mike T. making small talk waiting for the big moment. Observers in the background gather around an H-alpha scope to check out prominences pre-eclipse.

Image right: The BAS group was visited several times by KOA owners Wayne and Susan Bates (yellow shirts) and in this image just before sunset, we presented our "Thank you's" for the great hospitality. Susan and Wayne were happy to sign our poster (rolled up in my hand at right) See the full poster on page 14 of this Special Eclipse issue.

Image left: Garnet T. (black shirt) is getting some eclipse photography hints from John H. while Chris H. and Mike T. putter with equipment in front of a classic orange tube C-8. (Close up on next page). See also the image of Bailey's Beads obtained by Chris on pg. 7 for a sample view with this telescope. Not too shabby for a 42-year-old veteran scope! This was the first solar eclipse that was imaged through this scope and a first eclipse for Chris, -not his last he assures me.

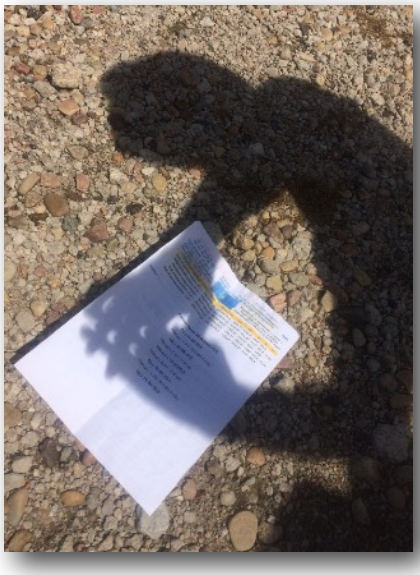
Image above: Chris H. drove down from St. Paul MN to see his first eclipse, and he described it thus: *"I did have time to look but it was a bit rushed, I was messing around with exposure and my equipment a little bit too much. It was a very amazing experience! I plan to try for the next one in 2024 as well."* Eclipses are <u>always</u> too short. Chris's brothers saw an annular eclipse at Long Pt. Ont. in 1994 but both missed this one.

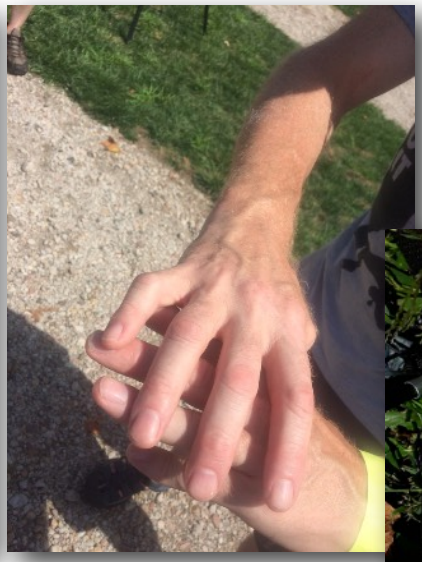
Image above: Frank W. set up a TeleVue 80 mm refractor to image the eclipse and monitored the image on a regular computer monitor.

Image left: Frank W. and Brett T. chat about imaging plans as Eric I. works on his equipment at right. Both Frank and Eric were right across the lane from the main group of BAS campers and we were able to take advantage of 120 V AC hydro during the eclipse, a real plus over batteries.

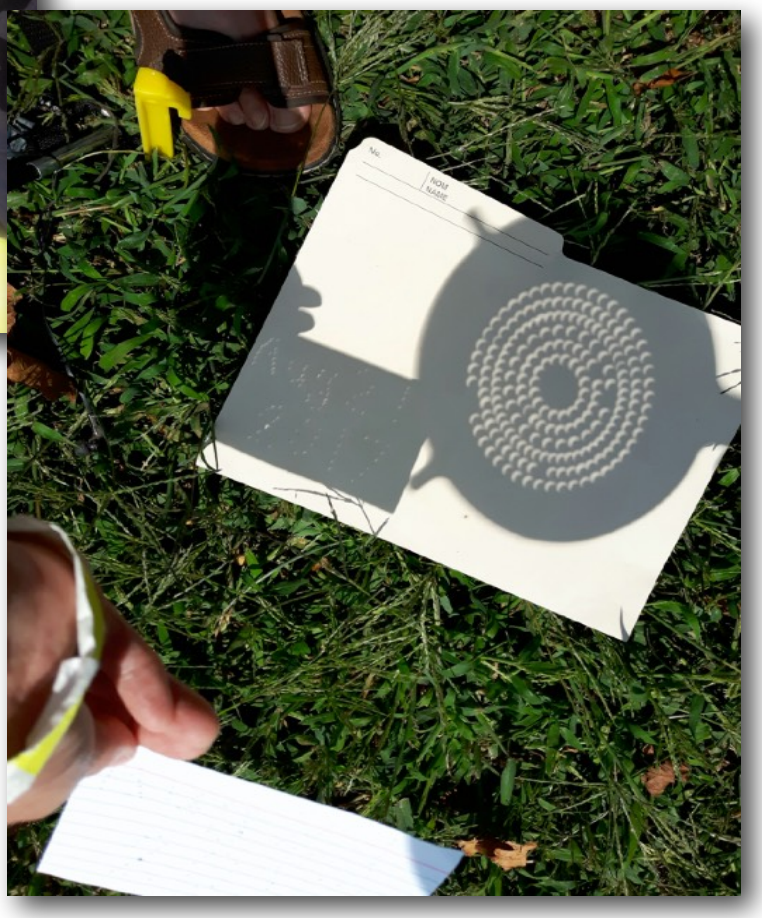
Images on these two pages were by Julian D.and John H.

Image below: Krista B-D., Phil V., Dave S., Cheryl D., Joan S. and Matt H. mill around the southern boundary of the group site pre-totality. Corn fields are evident in the background and constitute one third of the crops we saw as we drove across Nebraska. They also grow soybeans and sorghum. Cattle ranching is also done in places. Two solar scopes are seen here, Dr. Van Dorp's 80 mm Lunt (far left) and Cheryl's PST (at her right elbow). There is also a nice large pair of binos that provided a very nice view at totality.





Lorraine R. brought a colander to make solar images or maybe just decided to raid her RV kitchen for a suitable device, but it was an inspired idea! The nice uniform holes make an ideal pattern of pinholes that work beautifully to create a unique record of the partial phase of the eclipse.

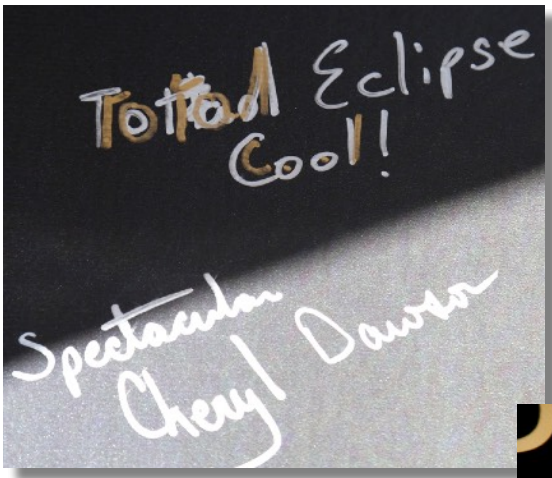


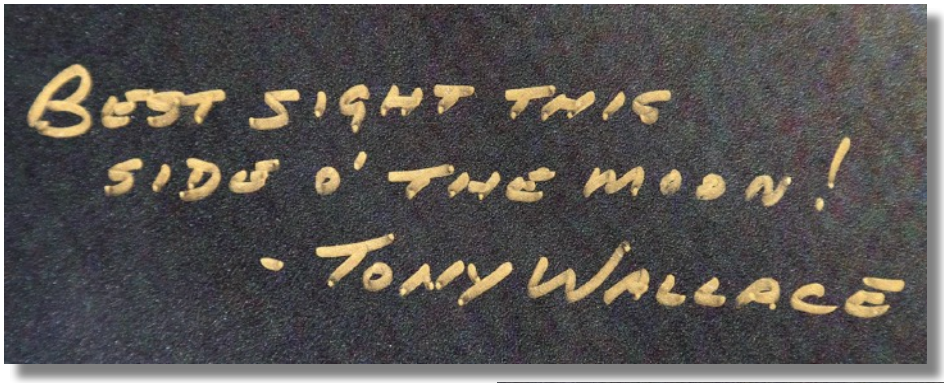
The Standard Technique for solar pinhole images involves making a pinhole or crossing your fingers to act as pinholes and creating a set of solar images on a screen that are crescents which change as time goes on. Only the partial phases are imaged in this way, my guess is that the light level is too low to show anything at totality and who is looking down at that point anyway?

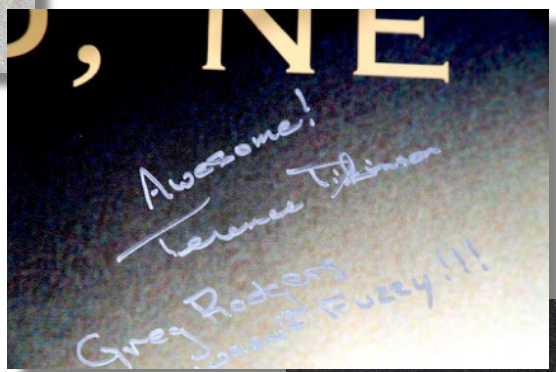
The images here are some of the creative ways that BAS folks found to make a memorable image. Steve I. would be pleased!

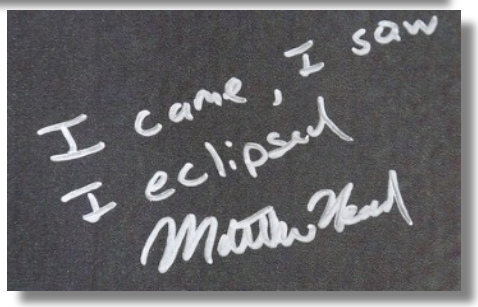
Robert A. sent in this image of me acting like a screen for the projected solar images. I had no say in the matter -I was told by the crowd to get down on my knees… [“I get no respect!” -ed]
Robert commented in the email:
BAS club president goes to great lengths to advertise "The Great American Eclipse" at Grand Island, Nebraska KOA minutes before totality.
Americans remark "crazy f$@#&# Canadian”!

I had hoped to use my safari hat to make my own pinhole images. It didn’t work, the holes were too irregular. Sadly, the pith helmet got a bit crushed in the packing for the trip home. Bummer.









The commemorative solar eclipse poster was a little surprise that went over well and made the group photo a bit special. Everyone in the group signed (except for two, and I am working on getting those autographs somehow). We had our very accommodating KOA hosts, Susan and Wayne Bates sign the poster as well as Canadian astronomy icon Terry Dickinson, who chose the same site we did totally by coincidence.

The poster will be available at the observatory and at future meetings for anyone to add more if you wish, now that the excitement of the occasion is over and you have you wits about you again. I know I was at a loss for words for several days after the eclipse.

Mark Jul 2, 2019, Dec 14, 2020, and Apr 8, 2024 in your Calendars

Map Right: On **Jul 2, 2019,** a total solar eclipse happens across the southern Pacific Ocean touching land only on the coast of Chile and then crossing into Argentina. At maximum the duration is 4 min 33 s but that is reduced to about 2 min 30 s when it reaches Chile.This shadow track from the low Sun passes over the Cerro Tololo Observatory in La Serena.

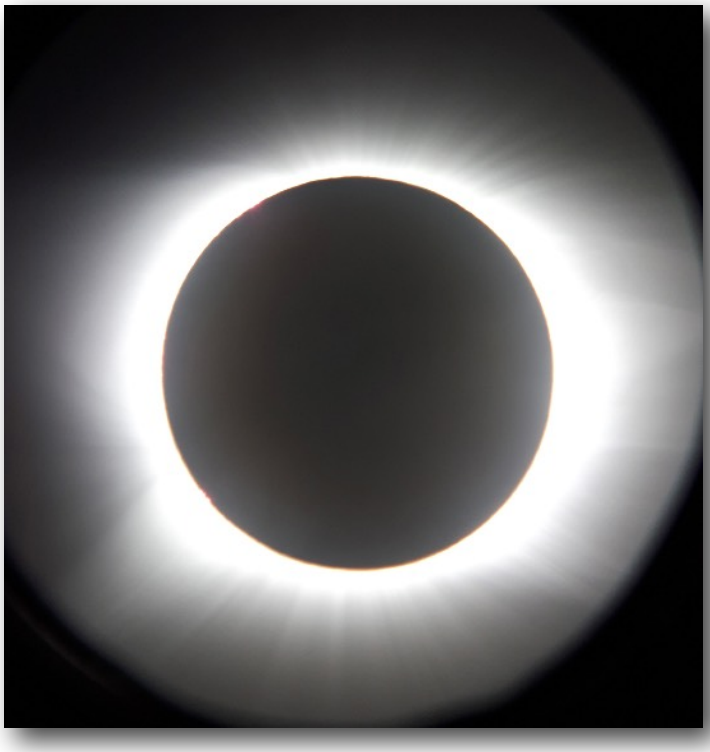
This is winter in the southern hemisphere where average temperatures range from 16 C in the daytime to 8 C at night - not even a chilly Canadian winter day.

Cloud cover this time of year averages between 35 and 40%.

Map Left: Another Chilean/Argentinian eclipse occurs on **Dec 14, 2020** when the track passes just south of the previous eclipse. Note Buenos Aires is on both maps. This one is centred on land and maximum duration of 2 min 10 s occurs in central Argentina. The landscape in Chile is pretty rugged in this part of the country but flatter in Argentina. Weather prospects are better than the previous eclipse (both are good!) as this is the dry season and less than 10% chance of cloud. Daily temperatures in mid-December range from 10 C at night to 20 C at noon.

Solar Eclipse on April 8, 2024 crosses North America again, but this time from SW to NE, through S. Ont. and over the Maritimes, so the USA cannot lay claim to this one in its entirety. Montreal is just inside the path and Toronto is just outside but so is central New Brunswick and half of PEI and most of the island of Newfoundland. None of the Canadian locations are favoured for weather as this is April and showers are typical.

The eclipse is best in Mexico and Texas where it will be higher in the sky and weather is better. Mazatlan, in particular, is in its dry season with moderate temperatures and low % of cloud cover. This is where the eclipse is longest at 4 min 24 s. Texas weather in April is about 40% clouds and approaching is the May rainy season. Temperatures on the Mexico coast range from 24 C (day) to 12 C at night . Pleasant!



Cell phones have become a common way to take astronomical images through telescopes and the eclipse was recorded by at least two of our BAS members. Lorraine Rodgers has sent in the two images at right of totality and the diamond ring at the end of totality. The nice partial below is hers as well.

Image above was contributed by Terry Garbutt who set up near Alliance NE, west of us and who observed visually after problems with his equipment. It is a longish story, and it will be best to hear it from him, but it was another example of the good advice given by Fred Espenak about rehearsing your activities and making sure everything works as it should before the eclipse. Solar eclipses are not very forgiving. Terry's image was with an iPhone 7 and exposure of 1/60s at f/2.8 ISO1250, 6.6 mm focal length.

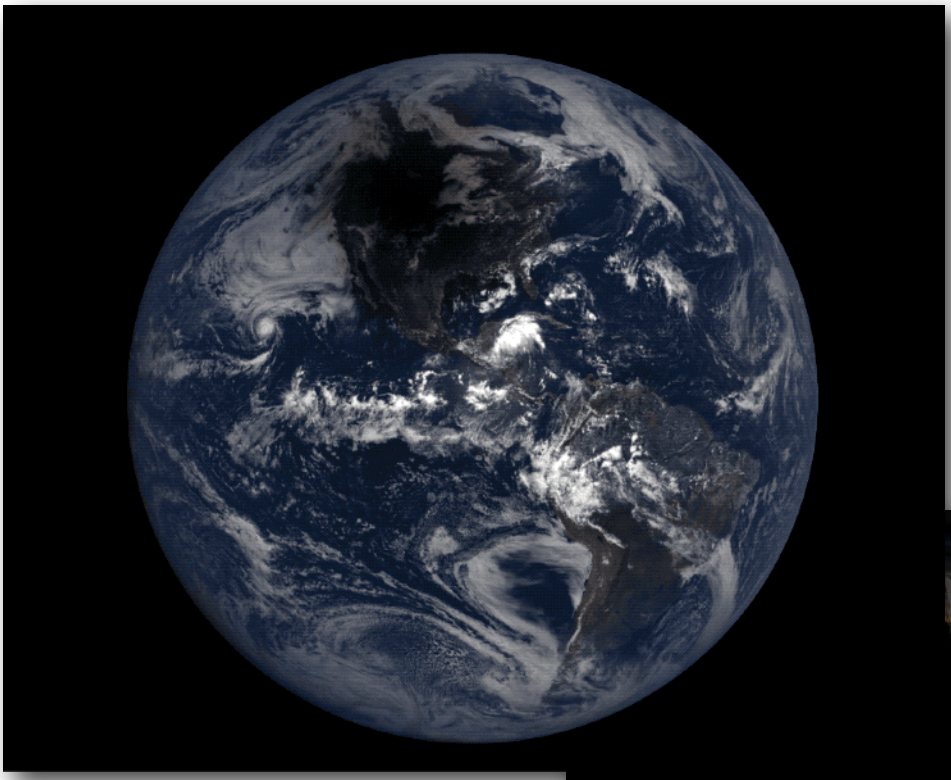
Lorraine R. setup was a Samsung Galaxy S5neo, using her Celestron NexStar 130 SLT. The phone was held in an iOptron adapter which includes a 20mm eyepiece.

Top right image was a 1/33s exposure at f/1.9, ISO 80, foc.len. 3.7 mm

Middle image diamond ring was 1/50s f/1.9, ISO 64, foc. len. 3.7 mm

Image left partial eclipse was 1/33s f/1.9, ISO 40, and foc. len. 3.7 mm

Below: From a million km out in space, NASA's Earth Polychromatic Imaging Camera (EPIC) captured 12 natural color images of the moon's shadow crossing over North America on Aug. 21, 2017. EPIC, aboard NOAA's Deep Space Climate Observatory (DSCOVR), photographs the full sunlit side of Earth every day, giving it a unique view of total solar eclipses. EPIC normally takes about 20 to 22 images of Earth per day and the video of the shadow pass is available here: https://www.nasa.gov/image-feature/goddard/2017/nasas-epic-view-of-2017-eclipse-across-america.

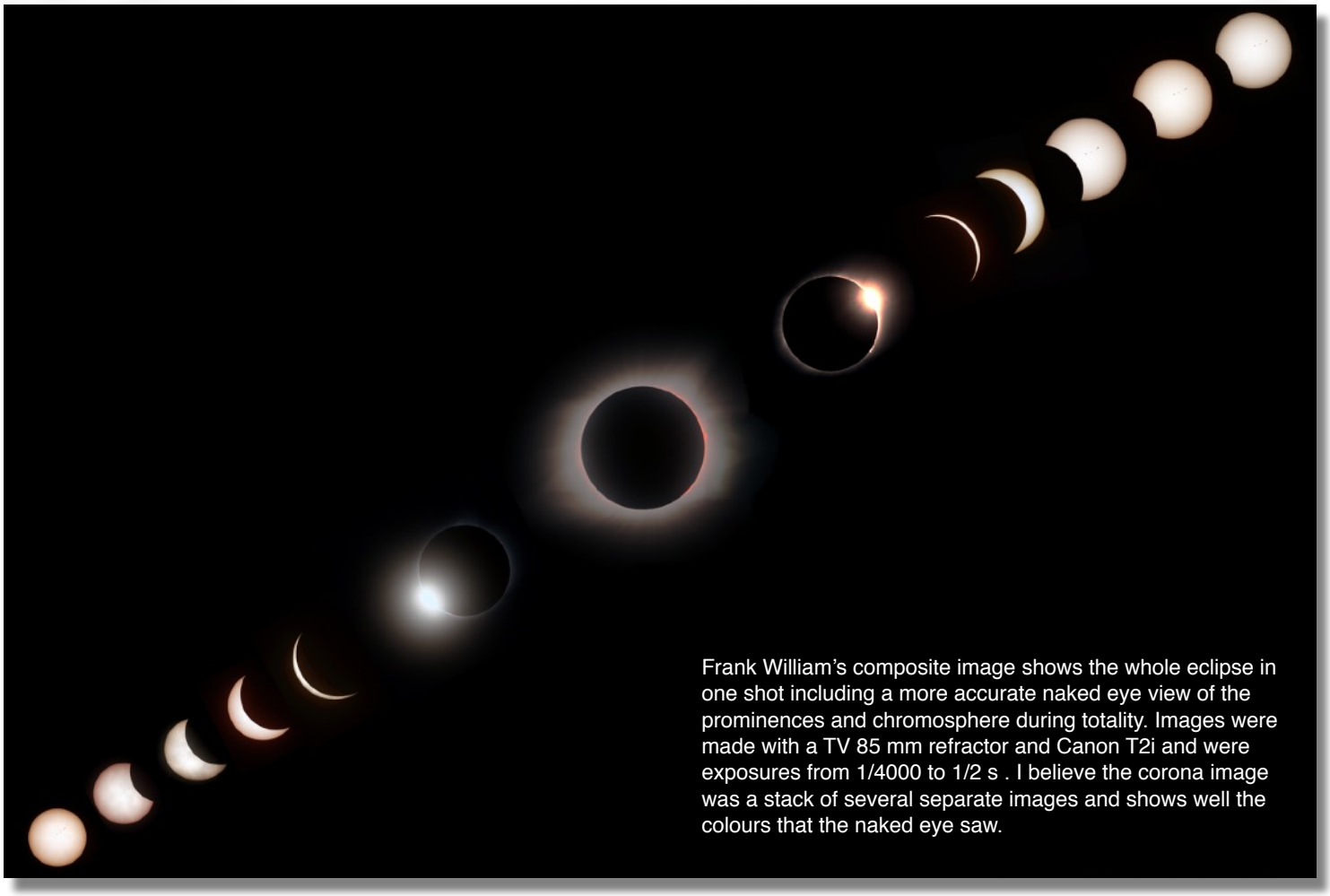


Above: (Aug. 21, 2017) --- Aboard the International Space Station, NASA Flight Engineer Randy Bresnik took still images of the eclipse as seen from the unique vantage of the Expedition 52 crew.

Image Right: **Umbra from Space** (Aug. 21, 2017) --- As millions of people across the United States experienced a total eclipse as the umbra, or moon's shadow passed over them, only six people witnessed the umbra from space. Viewing the eclipse from orbit were NASA's Randy Bresnik, Jack Fischer and Peggy Whitson, ESA (European Space Agency's) Paolo Nespoli, and Roscosmos' Commander Fyodor Yurchikhin and Sergey Ryazanskiy. The space station crossed the path of the eclipse three times as it orbited above the continental United States [but did NOT fly through the umbra -ed]. NASA image iss052e056225

Image Right: **Eclipse from ISS? -nope!** This is one of many Photoshop fakes that has appeared on social media sites purporting to be images taken from the ISS. The pasted-in Milky Way gives it away right away, but also it is not possible to see a diamond ring from outside the umbra nor does the umbra look like this from space. The official NASA report (link below image) unequivocally states that ISS did not pass through the Moon's umbra on Aug 21.

The official report on eclipse visibility from ISS is here: https://eclipse2017.nasa.gov/iss-observations



Frank William's composite image shows the whole eclipse in one shot including a more accurate naked eye view of the prominences and chromosphere during totality. Images were made with a TV 85 mm refractor and Canon T2i and were exposures from 1/4000 to 1/2 s . I believe the corona image was a stack of several separate images and shows well the colours that the naked eye saw.

The most spectacular part of a solar eclipse is the appearance of the corona. Photographers strive to take images of it and many do not succeed -it's range of brightness is beyond what digital sensors can record and one has to take many images at different exposures and then laboriously process them to create a spectacular image like those you see on Alan Dyer's website or posted on the online galleries of spaceweather.com or Sky and Telescope.

The image right is a single image and I have not tried to show what the eye would have seen. I wanted to show the wealth of inner corona detail so this image has been enhanced digitally to bring out the details that, I suspect, careful examination through a telescope at high power could have revealed had time been available. This is also a B&W image so the beautiful reds of the prominences are not there, -they were over-exposed in the original image, anyway.

Image taken by John H. with Canon 60Da through a TV NP101 refractor at effective focal length of 864 mm, ISO 200, exposure = 1/40 s. Contrast enhanced in Photoshop.