

Amateur Astronomy

Magazine

The Essential Journal for Amateur Astronomers Around the World!

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with Richard Wright

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ScopeX

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An Arctic Blast!

Jodi McCullough

Star People

The indefatigable astronomy
enthusiast Alan Dyer

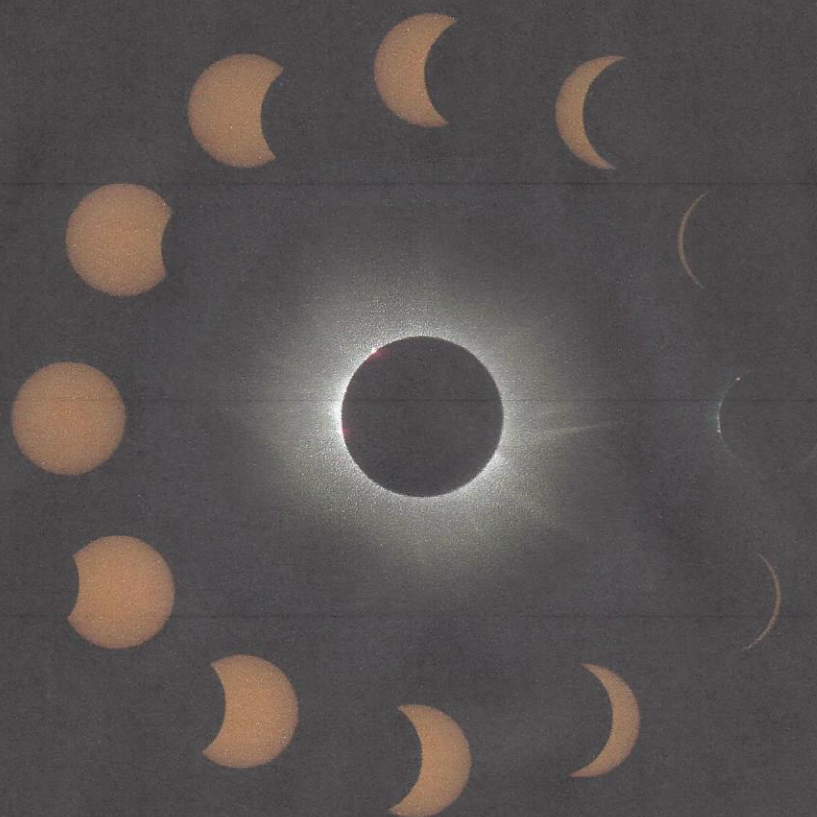
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Svalbard Eclipse: An Arctic Blast!

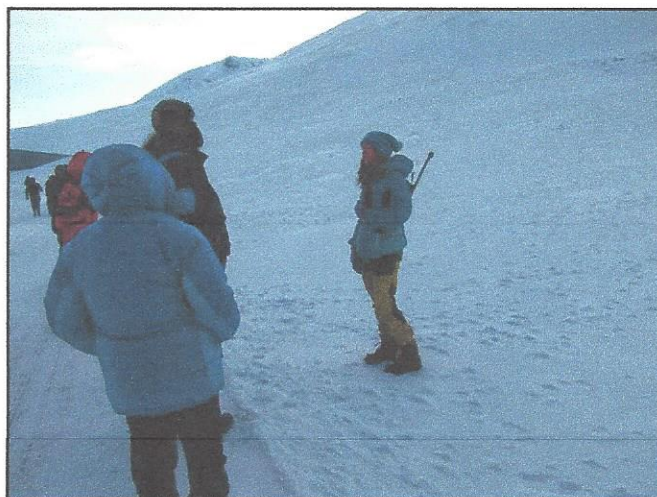
Article and Images by Jodi McCullough

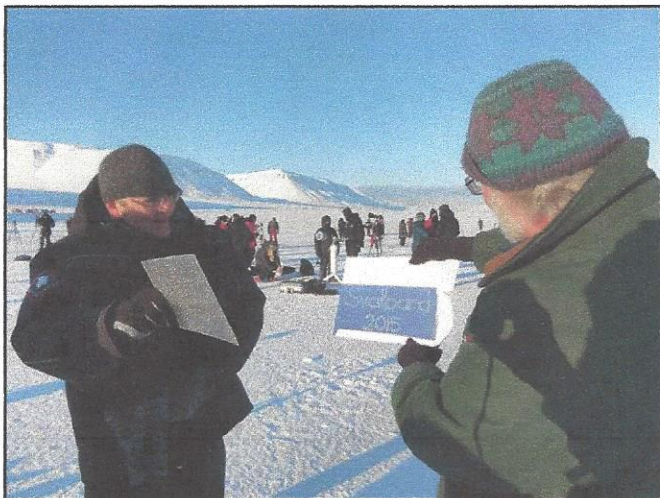
I have a confession to make. My husband and I have become eclipse chasers. If you have never seen a total solar eclipse, it is hard to understand the allure of two minutes of totality. We never thought about travel-

ing for an eclipse until friends convinced us to come to Australia to see the 2012 total solar eclipse. Joining others along the Mulligan Highway, we were bitten with eclipse fever. We had to see more! So it was off to Svalbard in 2015.

We had traveled to Australia on our

own but the risk of polar bears made us realize that we needed to join a tour group in Svalbard. As we would later learn, this was a wise decision. Our flight left Pittsburgh on Saturday, March 14 and arrived in Oslo the following morning. We spent a couple of days there visiting the National Museum where the Krakatoa-inspired





Roy McCullough and Jay Anderson holding a pinhole and screen and a polar bear greets us at the airport

painting by Edvard Munch, "The Scream", is housed. We also toured the fjords by boat between Flåm and Gudvangen. On Wednesday morning we joined the other 350 people on the TravelQuest tour and flew off for Svalbard. Following a two-and-a-half-hour flight, our plane landed near Longyearbyen where the wind was blowing the snow around, giving an impression that we had reached the North Pole. We climbed down the ladder and scurried across the tarmac into the airport terminal to escape the brutal cold. There we were greeted by a stuffed polar bear. My first thoughts were, "Why on Earth did we ever come to this place?" All we could see were clouds and snow and we were at risk of becoming some bear's lunch! What a contrast between warm, wonderful Australia and this frigid land! The 60% chance that the eclipse would be clouded out made this all seem like folly. Fortunately, my first impression was completely wrong. In just five short days, we would leave Svalbard totally entranced by this beautiful island and with one more eclipse under our belts!

Upon arrival at our hotel, we were informed that dinner would be out of

town at the Wilderness Center. In my panicked state, I could not imagine how this trip could possibly get any wilder. Dinner consisted of reindeer stew and huge polar brownies which we ate while seated around a fire inside a large tee-pee. I fell asleep that night apprehensive about the trip but as morning dawned, the night's sleep had changed my frame of mind and I was ready for adventure. Many activities had been planned for us with optional side trips. During our time on Svalbard, we would also be dog-sledding, viewing aurora and taking a snowmobile trip to see a glacier. While traveling around on a local tour we saw an arctic fox, a few reindeer and a seal in the harbor. One thing that struck me was the amount of

area pride displayed by the local tour guides. We saw an award-winning local museum and visited a World Seed Bank where we saw our first polar bear guard. I never felt insecure with them around. The necessity of having an armed protector was reinforced when we learned that a tourist from the Czech Republic, not with our tour, had been attacked by a polar bear the day before the eclipse. Fortunately, his injuries were not life-threatening and, being a true umbraphile, he stayed for the eclipse.

TravelQuest and Spitsbergen Travel did a great job planning our trip and making sure all was right for the big day. A viewing site had been selected inland,



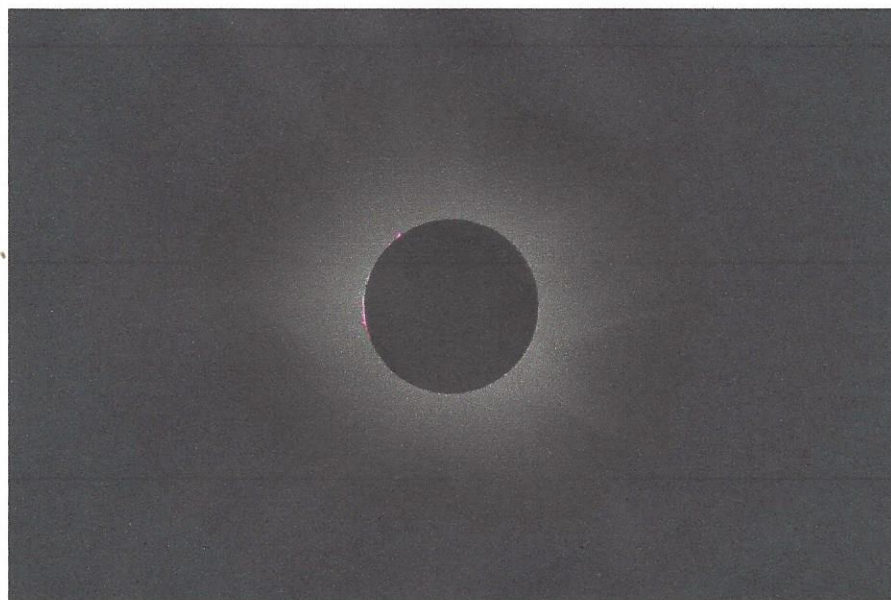
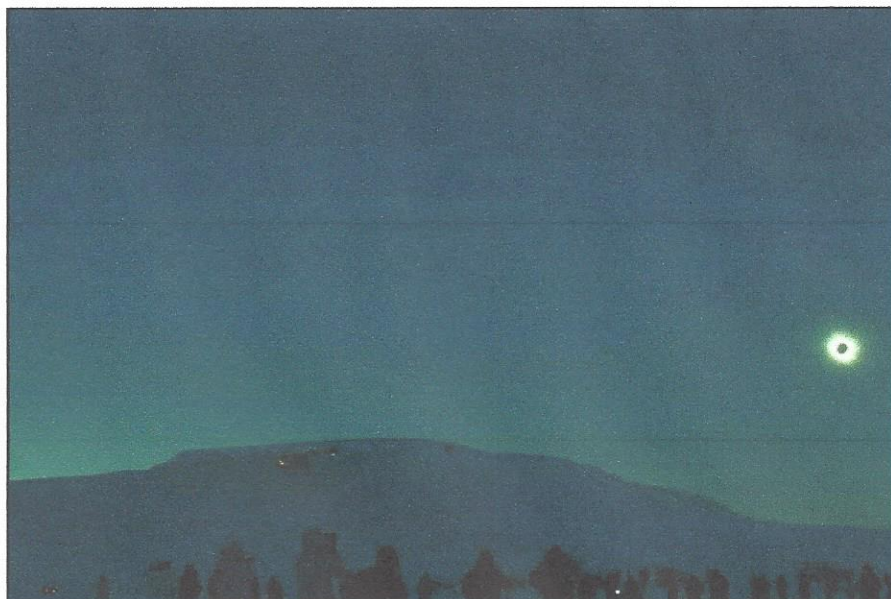
Page 50 - Left: 19. Teepee at Camp Barentz where we ate reindeer stew and heard local stories

Page 50 - Right: Polar bear guard at the World Seed Bank carrying a rifle

Right: View of the city of Longyearbyen

away from the ocean and the cloud shrouded town of Longyearbyen. A large tent had been erected with benches covered by reindeer hides to keep us warm, along with hot beverages and portable toilets. TravelQuest even made sure to have busses ready for those of us who wanted to set up early. We left around 7:30 am and arrived with two hours to spare. They also waited patiently for those who did not want to leave until the Moon left the face of the Sun, but busses were available if you wanted to leave early.

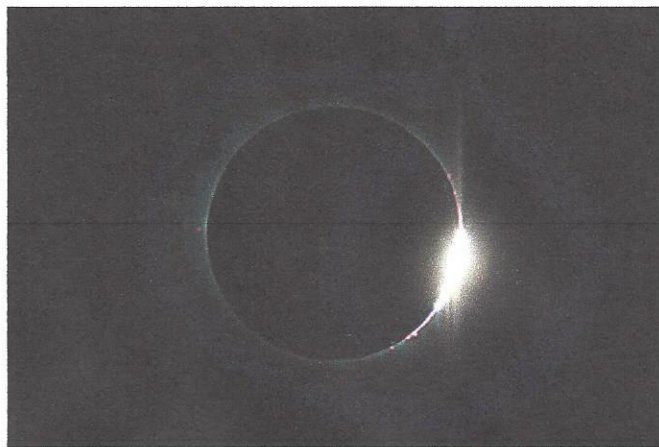
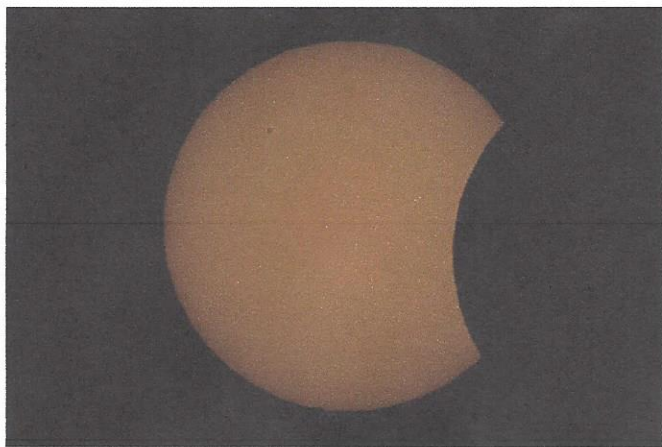
The morning of the eclipse had fewer clouds than previous days but the skies were still not great. That quickly changed as we drove to our site. The skies became perfectly clear and the clouds on the horizon, stayed on the horizon. It was very cold, around 0 to -5 degrees F and the snow crunched as we walked. I must confess that I was so excited, I barely noticed the cold. We had brought along a lightweight camp table and chairs so we could use our computers to control the imaging cameras. We set up in the assigned area, where snowmobiles carrying rifle-toting polar bear guards watched the perimeter. The day could not have been more perfect. The eclipse began and for the most part, our equipment worked. We brought along a pinhole sign and entertained others with views of the eclipsing Sun. With diminished sunlight, Venus appeared around 10 minutes before totality. We heard a shout for "Shadow Bands" and noticed shadow ripples moving across the snow. A call rang around the crowd for "Filters Off". The shadow bands distracted me so I missed the first diamond ring. Not a disaster since Jay Anderson, TravelQuest meteorologist, had recommended doing that anyway so you could better see the faint corona during totality. My first impressions were that the corona was lopsided, flattened at



Top: Wide angle with the eclipsed Sun on the Right, Venus on the left and the dog sled compound in the middle

Middle: Corona images to represent visual appearance

Bottom: Aurora taken the evening of the eclipse from Camp Barentz



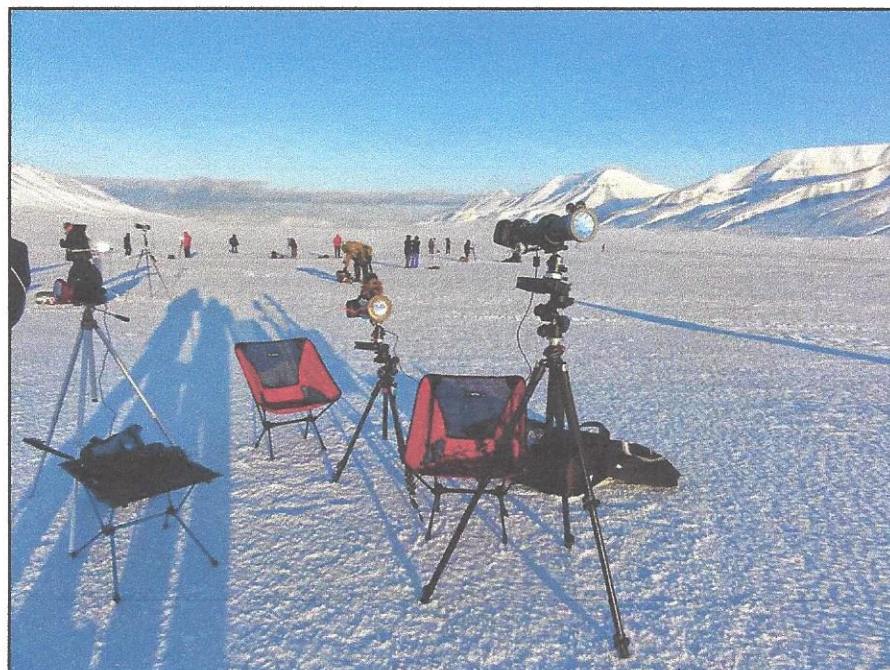
around 7 o'clock. I could see spectacular hot-pink prominences at 9 and 11 o'clock and wonderful streamers at 4 o'clock. The hoots and hollers from the crowd added to the exhilaration of the experience but Roy and I watched in silence, not even taking time from watching to talk to each other. At the dog-sled compound on the distant hillside, the security lights had turned on in the twilight-like conditions. It never got totally dark. We were so busy watching, we never looked for the aurora, a possibility that had been predicted. None on the tour reported seeing them. In two-and-a-half short minutes, the diamond ring returned. It was spectacular, sparkling away just like a real diamond. It was easy to see how it acquired that appellation. Soon it was time to put the filters on. Many people left but the eclipse was only half over, so we stayed. We walked around a bit, talking and celebrating with others, occasionally putting on our solar glasses for brief glimpses of the Sun. At the end of the eclipse, we left the site, cold and happy. This eclipse was even more spectacular than our first eclipse. When queried, many experienced coronaphiles indicated this was their first-or-second-best eclipse experience. Later, Aram of TravelQuest would offer that the cold, exceptionally clear skies had made the difference. Given that, sign us up for Antarctica in 2021! We had a celebration dinner later that evening that included special Champagne in large bottles with solar

eclipse labels from a French vintner. For us, the day was topped by an evening aurora show. What a spectacular thirteen hours!

For those of you interested in going eclipse hunting, we need to talk about equipment. If you don't plan to image, all you will need are solar glasses. If you want to capture the experience, taking pictures can be as simple as using a point-and-shoot camera during totality or as advanced as attaching a telescope with a solar filter to a DSLR to get a close-up view throughout. Roy and I are experienced at imaging deep sky, planets, the Sun, the Moon and aurora but still needed practice to get ready for this trip. We started testing equipment in January. Fortunately, Northeastern Ohio had been "blessed" with a very cold winter which helped

us practice in temperatures similar to the frigid ones we would see in Svalbard.

We used three imaging arrangements. The first was a Televue 60mm telescope attached to a Canon 60 Da. This had worked well in Australia so we knew it would be a good choice to get the corona. I wanted a more magnified view for the second scope. Originally I had attached a 72-mm AstroTech and used a 2X Powermate. This required an extension tube to come to focus, so the system was very long. I was concerned that it was a bit unstable but it did work well in testing. Ultimately, two weeks before leaving, I changed scopes. While visiting a newly-opened local telescope store, we purchased a Maksutov-Cassegrain by Levenhuk which had an aperture of 102 mm and



Top Left: *Ingress showing Sunspot*
Top Right: *Diamond Ring*
Right: *Our imaging setup including table and chairs*



A view of the eclipse site and fellow eclipse chasers ready for the Big Show

focal length of 1300 mm. The weather cooperated with two sunny days before our departure so we were able to test the new scope and find the correct solar exposure settings. I discovered significant vignetting when it was used with our Canon Mark 5D III, which would require me to keep the Sun carefully centered throughout the two hour eclipse. Another issue would be focusing the Mak while wearing heavy gloves. I tried attaching a clamp to the focus knob but it was too heavy and turned the knob on its own. I finally fashioned a focus knob turn stick from some zip ties that I duct-taped together. You can see the orange stick in the scope photos. In the cold Svalbard temperatures, the focus was stiff but still worked. When I closed up shop after the eclipse, the cold and brittle focus stick broke. Good timing! I will need to replace that before the next imaging event. Our final imaging cam-

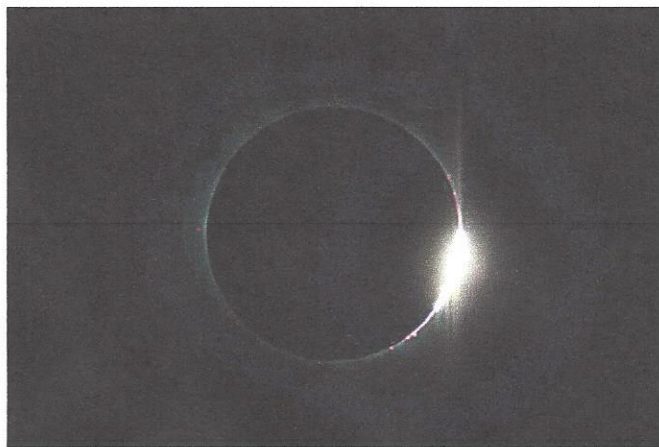
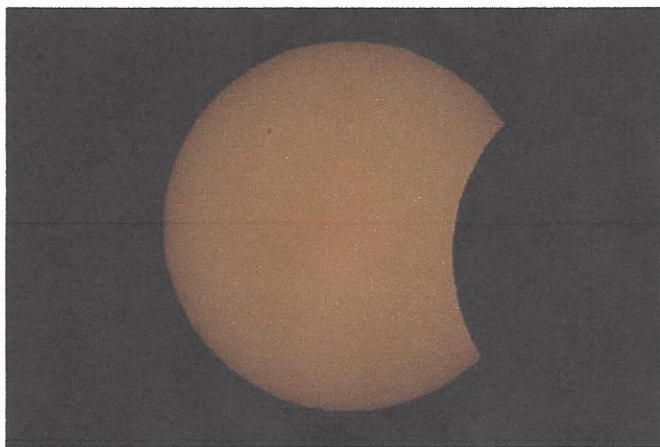
era was a Canon Mark 5D II. I wanted a wide-angle shot that included the Sun and Venus. I used Sky Safari to test the field of view with various lenses and decided on a 50-mm lens. We attached this to a stationary tripod.

We wanted to track the Sun with the two telescopes but needed to keep the weight down to 35 pounds for check-in bags and 16 pounds of carry-on for each of us. Taking our equatorial mount was out of the question. We had two iOptron Sky Trackers and used them on two Manfrotto tripods with Junior Geared Heads. Early in testing, we realized the iOptron only went to 70 degree latitude and Svalbard was at 78 degrees. Roy decided we could acquire the extra 8 degrees by tilting the Manfrotto head. This worked like a charm on eclipse day. The easy three-direction tilt head of the Manfrotto allowed us to make minor adjustments

to keep the Sun in the view. Roy has a good eye for direction and got us aligned north. We did not rely on a compass because of being so close to the North Pole, we feared that the difference between true north and magnetic north would create an issue.

Our final equipment change occurred the day before we left. We replaced our suitcases with ultralight ones. Still too heavy! Finally, Roy made a quick trip to the photo store and purchased a lighter carbon fiber tripod. That did the trick! We would wear our heavy boots, coats, warm clothes and carry lenses and cameras in our pockets. We looked like pack mules but so did everyone else. Fortunately, they only weighed the suitcases, not us!

We did not want to be so busy imaging during the eclipse that we missed watching the event, so we brought



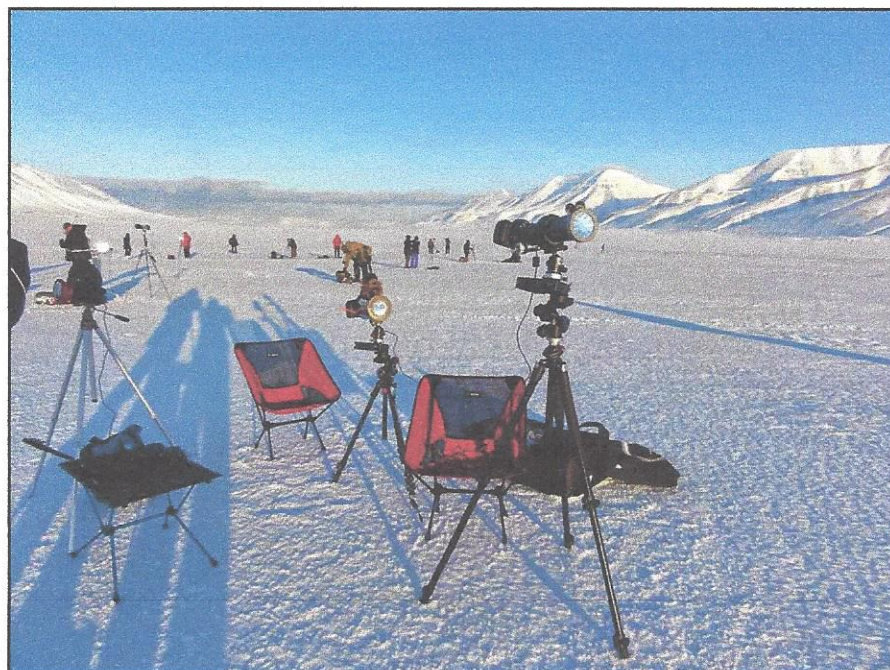
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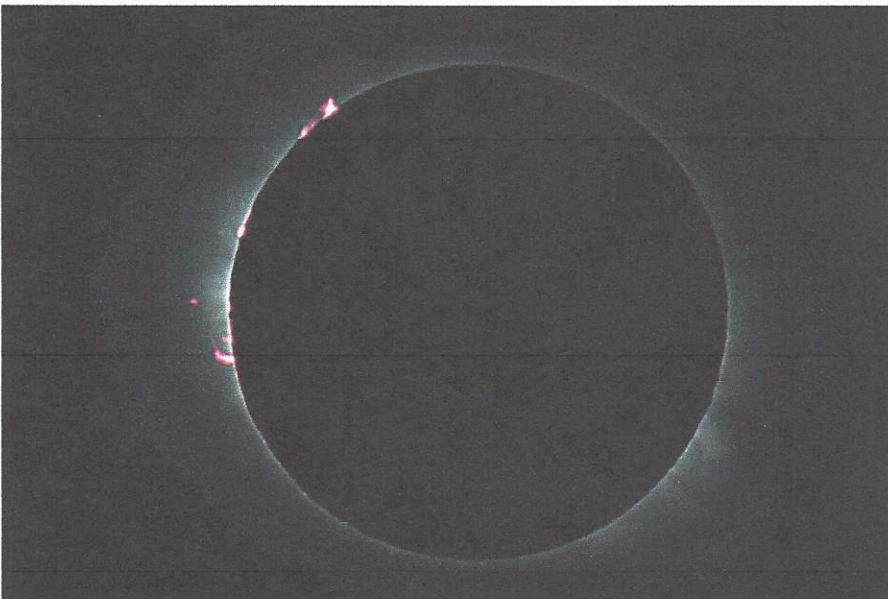


Top Left: *Ingress showing Sunspot*
Top Right: *Diamond Ring*
Right: *Our imaging setup including table and chairs*



Top: Collage of Bailey's Beads and the Diamond Ring

Below: Pink Prominences on the left. At 4 o'clock on the right the corona is being distorted by the magnetic field of a sunspot that had just rotated out of view



along computers to control the two scope cameras and used an intervalometer on the wide view camera. Roy used Eclipse Maestro on a Macintosh computer and I used Eclipse Orchestrator on a Windows machine to trigger the shutter at our custom-designed intervals. Roy had been imaging the Sun using the Mac the entire

winter and had done so without fail under similar cold conditions; however, he had never tried to start the computer after letting it sit in the cold. We chose not to boot the computers until closer to show time in order to preserve battery life, but that was a mistake with the Mac. It would not start, so Roy had to hold it under his coat to warm it and

missed the early eclipse photos. Fortunately, my computer started just fine so I captured our ingress images. After using Backyard EOS to adjust focus, I turned on Eclipse Orchestrator and turned down the computer screen brightness. When the eclipse ended, I still had 50 % power left. The other issue caused by the cold was that while the intervalometer on the wide-field camera appeared to be working, it was not triggering the shutter. I stopped the automatic mode during totality and just kept pressing the shutter button while I watched the eclipse, hoping one shot would come out okay. The next time I image during temperatures that cold, I will wrap the intervalometer in a heat pack.

The pictures we captured have been processed with Images Plus and Photoshop. We are happy with the images we got, even with losing some of the ingress on the Televue and not capturing the entire sequence in the wide view. The old adage "if at first you do not succeed..." means we will just have to try this again. Fortunately, the Great American Eclipse of 2017 will not require a plane ride with weight restrictions. We plan to be mobile: we don't want clouds to get in our way! In the meantime, there is always Indonesia in 2016...



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