

2013 MARCH

# TOTALITY!

ISSUE 13

THE JOURNAL FOR ECLIPSE CHASERS

eclipse travel adventures

[http://xjubier.free.fr/en/site\\_pages/Solar\\_Eclipses.html](http://xjubier.free.fr/en/site_pages/Solar_Eclipses.html)  
and

<http://www.eclipse-chasers.com/totality.html>



Total Solar Eclipse 2012 - Flash Spectrum at 2<sup>nd</sup> Contact

Used by permission, © Robert & Elisabeth Slobins

See a close up breakdown of the emission spectra of the chromosphere on page 9

**RESULTS: TOTAL ECLIPSE IN FAR NORTHERN  
AUSTRALIA AND THE SOUTH PACIFIC**  
*FUTURE ECLIPSES IN AUSTRALIA & NEW ZEALAND*  
**BOOKING: 2013 TOTAL SOLAR ECLIPSE**

For the Total Solar Eclipse of 2012, most of the length of the 12,000 kilometer (7500 mile) path of totality was visible from the South Pacific Ocean, and only 900 kilometers of which was visible from land in far north Australia. Indeed it was a small portion of the path of totality, and much of it was not easily accessible as few navigable roads exists in the region, but as luck would have it, the Great Barrier Reef (GBR) is found only a few kilometers offshore along the east coast of Far North Queensland, making this area a tourist hub and became an ideal focal point for eclipse chasers to converge in the tropics for a sunrise eclipse.

I found it extremely difficult to pick from the throngs of excellent eclipse images that were made at TSE2012, and perhaps no eclipse has been better imaged than this one. I can only bring so much together to present to you in these few pages, but I hope some of these are the best you can find. They all made me very envious.

With about a 50/50 predicted chance of clear/cloudy skies, the beaches became crowded as locals along with eclipse chasers converged to watch the eclipse, and others opted for the mobility of cruise ships and a potentially longer eclipse out to sea, and another eFLIGHT was planned for a handful of individuals, and this is how it all turned out . . . .

# TSE2012



The Australian government anticipated at least 60,000 eclipse chasers to be in the region for the eclipse in addition to the some 200,000 people living in Cairns and the surrounding towns in the coastal areas of Far North Queensland. Many of these individuals were Aussies who came up from Sydney, Melbourne and other population centers, and many others who came from around the world for the event. There was word going around that a cruise ship failed to maneuver into a break in the clouds to see totality, but there were also buses that were under contract and could not move away from Port Douglas for a better view as well.

Australia is a cornucopia of flora, fauna and wildlife. From my personal viewpoint, our apartment in Trinity Beach was a transition zone between the rainforest and the coast, and right in our back yard, so we had a small microcosm of this at our feet. Roos, Goannas, the Rainbow Lorikeet and Kookaburra (birds), the Ulysses and Cairns Birdwing (butterflies), just to name a few that we watched from our balcony.



A roo relaxes on the dirt while another stands watch; a Kookaburra looks for some food such as small lizards (which we saw one beat senseless and then eat), and huge flowers abounded at the Marlin Cove Resort at Trinity Beach. All images © Larry A. Stevens.



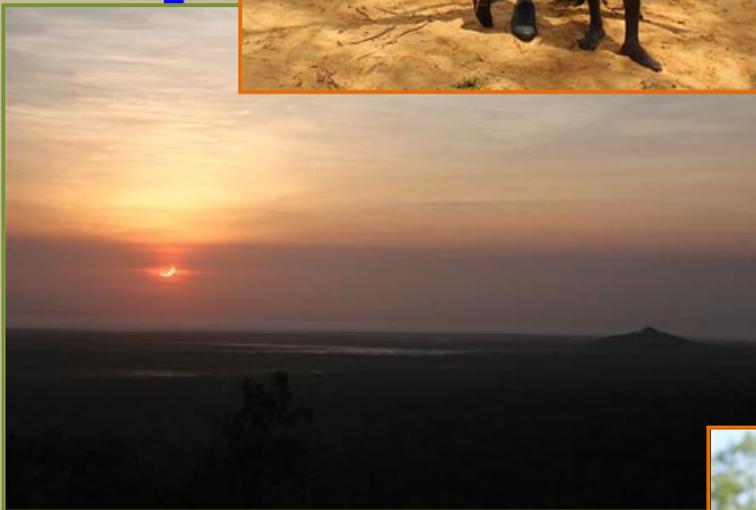
A Trinity Beach sunrise seen 2 days before the eclipse (below), and the moon at e-minus 25 hours (left), the day before the eclipse. Both images show the weather pattern common for this region, and is a clue to what did happen on eclipse day. Both images © Larry A. Stevens.



# GURRUWILNY

Some of the first observations were made from an overlook at the Gurruwilny Swamp near Ramingining in Arnhem Land, Northern Territory. People who live here are called “Top Enders” because of the location in north central Australia. More than 200 observers watched as a mostly eclipsed Sun rose out of the low haze. Although the skies were far from pristine, totality was still visible through a layer of clouds, and an indigenous ceremony took place. The Yolngu culture believe an eclipse is the beginning of the marriage system, the Moon being the man (husband) and the Sun the woman (wife), and when the two come together that is the marriage of the two<sup>1</sup>.

<sup>1</sup>This is a partial summary from a report by Clare Rawlinson, 105.7 ABC-Darwin (radio); and found on the internet, check it out and listen to the inspiring audio report, just click on the ABC logo here for the link;



Images by Clare Rawlinson



## PORMPURAAW

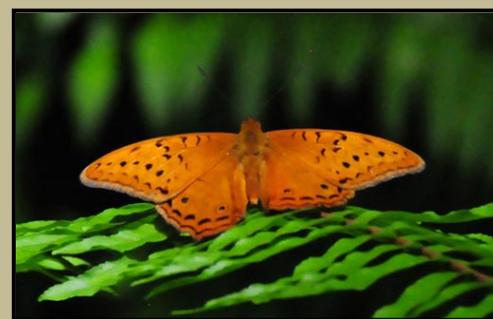


A time lapse sequence captured at Pormpuraaw by Geoff Sims clearly shows the oblate Moon's shadow this close to the beginning of totality. Used by permission and © by Geoff Sims.

[Click on the above image to go to Geoff's web page to view more images and the time lapse movie.](#)

After crossing the Gulf of Carpentaria the path entered Far North Queensland. Here, the Joe Cali "Escape Flight" team, were some of the first to see totality in the coastal town of Pormpuraaw. The escape flight was prearranged as a last ditch effort to escape the east coast if the weather looked poor on the east coast; it was essentially an insurance policy. Not everyone signed up for it since it was not exactly inexpensive.

After hearing the weather predictions, several of the individuals who had signed on for the escape flight decided to go there since the coast looked poor. A group of more than 20 ended up taking the flight, and another 17 or more headed out at midnight to drive inland, past Mt. Carbine and end up near the Maitland Downs airfield. Those on the escape flight woke later and headed to Cairns airport to board their plane, only to find that the plane had not been fueled! A few quick calls got the plane fueled up and off they went to the east side of the Gulf of Carpentaria, and landing very near sunrise. A few made a mad dash to an observing field just a couple kilometers away and rapidly set up their gear; first contact had already begun. Geoff Sims still managed some remarkable images seen here. This truly is where the descriptive phrase "eclipse chaser" originates!



**ABOVE RIGHT** A golden butterfly and **RIGHT** a Swainson's (Rainbow) Lorikeet, both imaged at the sanctuary in Kuranda. © Larry Stevens

**< LEFT:** The movement of the Moon's shadow is quite evident in this short sequence. The images were made at -49; -16; -3; +19; +42 seconds relative to mid-eclipse (top to bottom). Used by permission and © by Geoff Sims.



## ECLIPSER 1

Eclipser 1 is the designation of a latex balloon that was filled with helium and launched thousands of meters above the earth it was the innovation of a consortium of Romanian scientists that would send a payload high into the stratosphere and video the Moon's shadow as it approaches and recedes across the Australian tablelands. Primary group members included;

- Cătălin Beldea, developer and astronomer at Science & Technology and eclipse chaser
- Florin Mingireanu, researcher and engineer for the Romanian Space Agency (ROSA)
- Marc Ulteriu, editor for Science & Technology, a Romanian periodical
- Adrian Florescu, president of the Romanian amateur radio club, YO3KSR

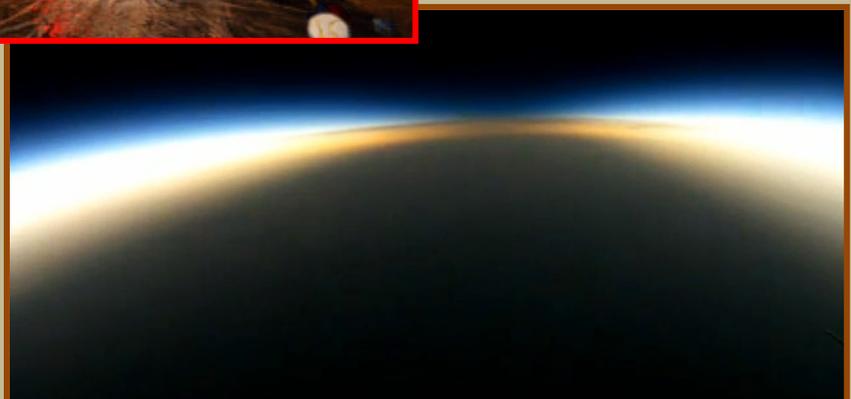
Our aforementioned friend Joe Cali assisted the group in acquiring the clearance from the Civil Aviation Safety Authority (CASA) in Australia, as well as other local radio operators. The balloon was taken to its point of embarkation the night before the eclipse. Final flight clearances were obtained, and the balloon was launched about 10 minutes after sunrise. 31 minutes after launch, the balloon passed the 10,000 meter mark, and 25 minutes later it passed 18,200 meters, the upper limit of controlled space. 21 minutes later the Moon's shadow engulfed the balloon at about 25,000 meters. The balloon continued its ascent 36 more minutes until the balloon burst at an altitude of 36,800 meters (121,000 feet). The payload then parachuted back to Earth where it landed in a tree, where it was recovered. We include a few captures here of the flight.

The sun in eclipse as seen from some 25,000 meters above the Far North Queensland in the Australian tablelands. >



< Preparing the balloon for flight

The Moon's shadow seen as a very oblate sphere receding into the distance >



## MAITLAND DOWNS

No one likes being on a beach for a total solar eclipse like me, but when the choices are maybe seeing totality or undoubtedly seeing totality, undoubtedly wins out. The story for me started out months before the eclipse to travel inland, and even studying the roads near the centerline in Far North Queensland. If it looked good near the beach, we would be near the beach, but mostly the planning for location's was left up to our group leader, Joe Cali. The final call came about 8 hours before the eclipse. The main group met up at midnight and caravanned to our site near Maitland Downs with Glenn Schneider leading the way as he had been to the site earlier to check out the location's suitability.



We headed for the Atherton Tablelands by negotiating the Kennedy Highway as we drove through light rain as we climbed to Kuranda, and on to Mareeba, where we connected onto the Mulligan Highway. After a couple hours of driving we had a

short break to stretch our legs at Mount Molloy. We were soon on our way for another hour on the road, past Mount Carbine, until we arrived at the viewing location near the Maitland Downs airport, and just a kilometer and a half past the centerline, which was indicated by a road sign. We arrived in the dark, and began setting up under the stars, with the Large and Small Magellanic Clouds shining down on us.

We were not the only ones there, but it was a relatively small group of perhaps 60 people in a large field that was nicknamed the "Cow Manure Paddock." At least 20 minutes before totality, a busload showed up from a tour group that was likely on a last minute run for clear skies. They quickly filed out with tripods, cameras and telephoto lenses attached, or binoculars in hand, and surged onto a hill behind us, setting up among the trees. Likely they had a slightly better horizon than most of us. Quite frankly a number of us were relatively unaware of the higher ground since we arrived in the dark and did not notice the higher advantage point.

Across the road to the northeast was a hill and by the time the Sun rose above the nearby Ghost Gum trees,



still without leaves on their branches, the Sun was already 20% eclipsed. The partial phases were compressed into a span of less than one hour before totality arrived. Still low to the local horizon, the corona's span in the sky seemed to be enhanced by the "moonrise effect", where it "appeared" much larger than it would appear if it were higher in the sky, but as we all know, that is only a perception, an illusion. Nonetheless it was truly spectacular. The corona spread out like a spider's legs, sprawling from all directions and coiled near the solar surface. It was a dazzling sight.



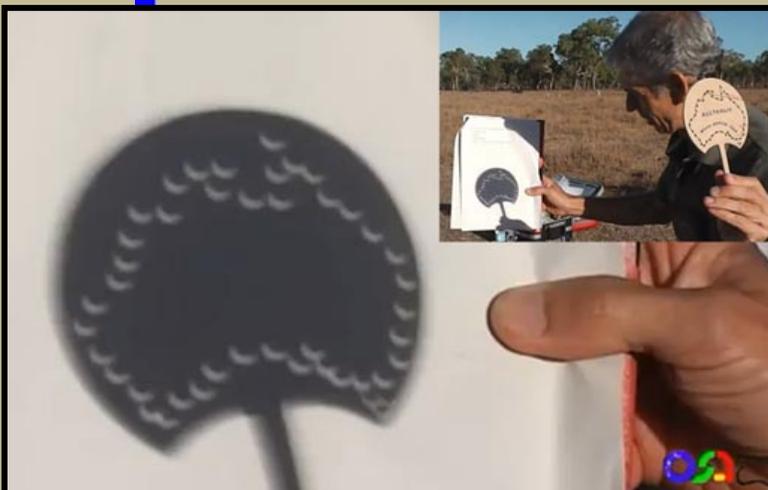
Imaged just after 3<sup>rd</sup> contact, the two images above are actually the same image. The bottom selection was stretched in Photoshop using the curves tool. The upper image hints at the light layer of clouds that were over the Sun during totality, but the lower image shows this in greater detail. These striations are only wisps of cloud, unlike the shadow bands that were visible on the clouds for TSE2010, and they are not closely spaced nor do they align with the orientation of the reappearing Sun. Photo taken at Maitland Downs using a C90 and Nikon D300, 1/250 sec, © by Larry Stevens.

# Asociacion SAROS Expediciones Cientificas

(Click title line for more images!)



Images from the SAROS expedition from Spain; clockwise from top right; 1) A road sign marks the centerline along the Mulligan Highway very near Maitland Downs, 2) The eclipsed Sun above the local ant hills and a single Ghost Gum tree, 3) Holes punched in a card the shape of Australia outlined with pinholes, when projected form crescents of the partial phases, 4) The SAROS expedition made up of (l to r) Francisco A. Rodriguez Ramirez (8 totals), Antón Fernández Villanueva (7 totals) and Óscar Martín Mesonero (5 totals).



Right; photo © by Oscar Martín Mesonero and, taken with a 300mm lens



ABOVE; In this wide field view, a combination of dozens of eclipse images, and many more flat fields and dark frames made by various lenses and 3 photographers; Man-To Hui, Robert Slobins and Constantinos Emmanoulidis, all compiled by Miloslav Druckmüller. Used by permission and copyright © by each of these individuals.

BELOW; Imaged by Constantinos Emmanoulidis with a Takahashi TSA 102, 816 mm, F8, Field flattener TOA-35, Canon EOS 5D (ISO 100) - using Solar Eclipse Maestro, 41 eclipse images and a total of 1621 images including dark frames and flat-field frames, were used to make up this image, which was compiled by Miloslav Druckmüller using his 6 different specialized programs. Used by permission and © by Miloslav Druckmüller.

---

*Click on the image at the right to go to Miloslav Druckmüller's web site for TSE2012 to get see the high quality detailed image and info on how this image was made.*

---



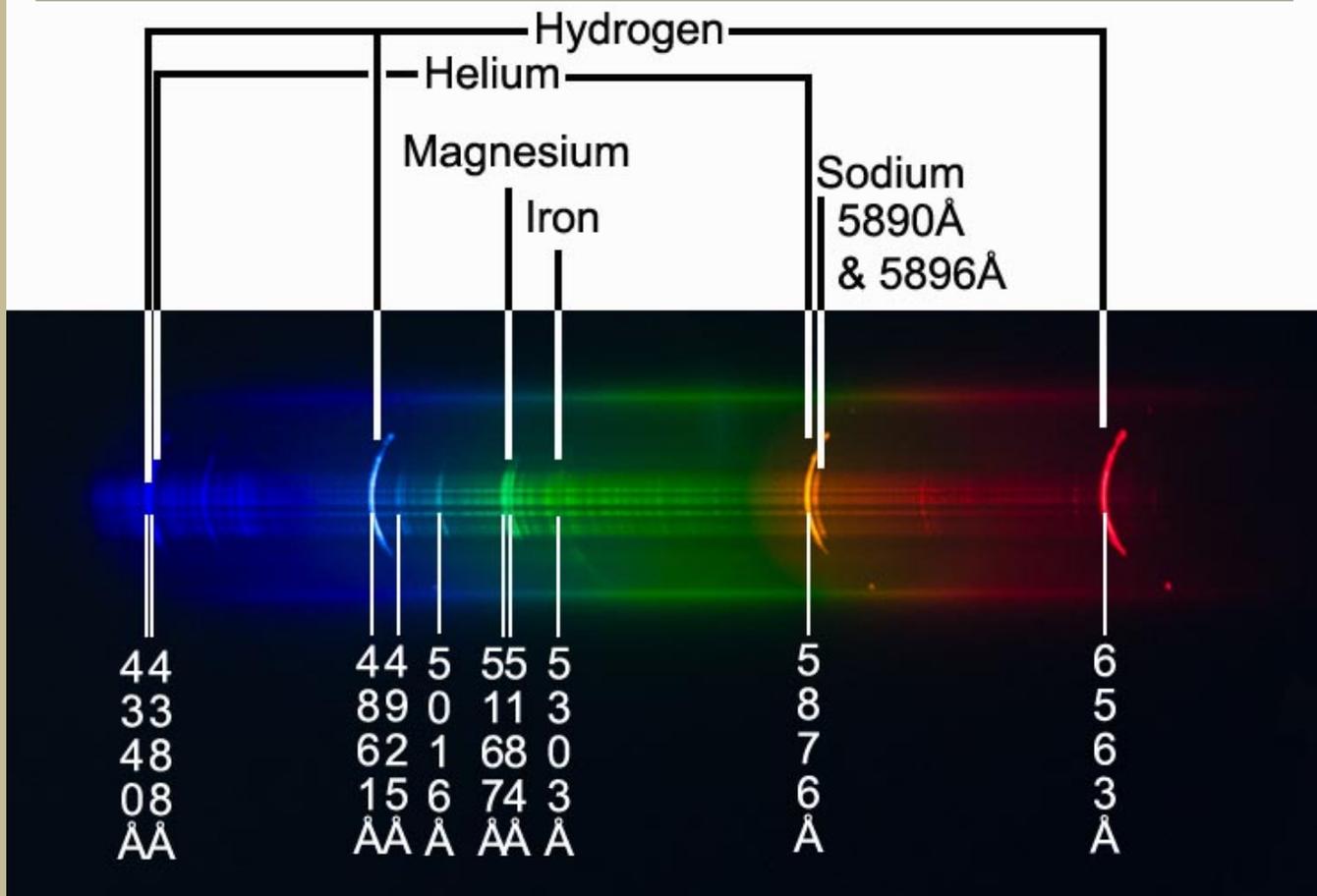
---

*The images on this page have been adjusted to approximate the orientation in the sky as you faced the eclipse Sun*

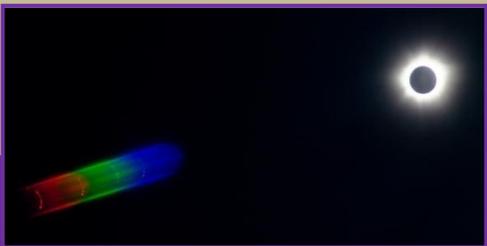
---

**The emission spectrum of the Sun's chromosphere**

At 5303 Å the whole corona is faintly visible in this image extending into the green. At the resolution of this image, the 5167 Å line is a bit thick as it is nearly merged with one at 5173 Å and combined with the 5184 Å line next to it makes up the magnesium triplet. Helium is identified by the 4388 Å line and 5876 Å, which is found in a doublet at 5890 Å and 5896 Å for sodium. Image used by permission and © by Robert & Elizabeth Slobins.



2<sup>nd</sup> Contact Flash Spectrum  
© Robert & Elizabeth Slobins



Mid-eclipse Flash Spectrum  
© Robert & Elizabeth Slobins

3<sup>rd</sup> Contact Flash Spectrum  
© Robert & Elizabeth Slobins



Robert Slobins and his gear at the Maitland Downs eclipse site (right)  
© Larry Stevens



## MT. CARBINE and the MULLIGAN HIGHWAY

The shoulder of the road near Mt. Carbine had a number of cars parked along the highway at higher elevations, and people were setting up camera and telescope equipment, or were just waiting for the eclipse, as we passed by in the dark morning hours; even a bus or two was seen next to the road. By dawn there were likely many more, some with plenty of room and some a bit too close to the road, and still others that pulled completely off the main highway. Among the many that were there, Phil Hart came up from Melbourne for the eclipse and had several large pieces of equipment he borrowed and shipped ahead. Here is some of his descriptive comments he made on his web site;

**by Phil Hart**

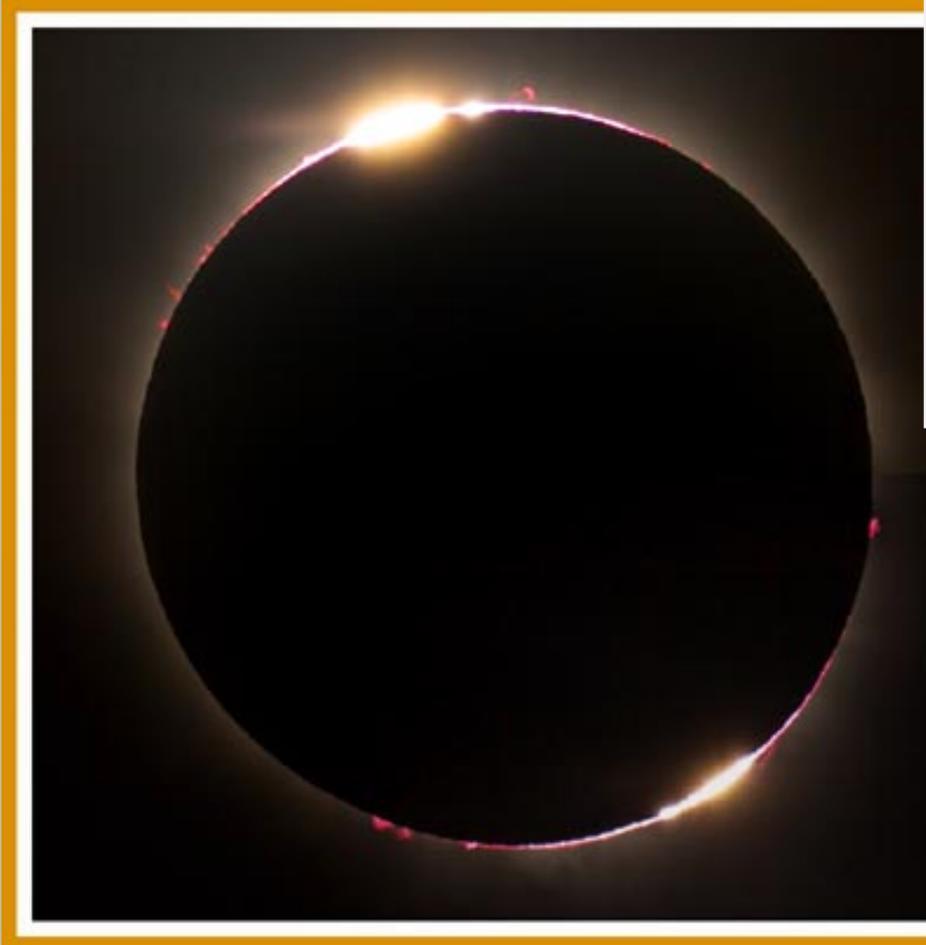
The visual view of the eclipse was spellbinding and beautiful, but the cloud affected corona imaging a great deal. Despite all the testing (even during the night beforehand on site), my camera control scripts with Eclipse Orchestrator also didn't function correctly, despite doing so reliably in practice, but the most important bits were ok. Happily though I didn't look at the cameras much during totality, and

having seen one eclipse previously I found I could take much more in this time. I've since realized that the reason the scripts didn't work is because in an eclipse morning daze (after less than two hours sleep) I changed the cameras from continuous shooting to single shot mode.... Doh!



Eclipse sequence imaged with a Canon 1100D (aka Rebel T3) using a Samyang 35mm lens. The light clouds are visible in the image here. © Phil Hart

At 2nd and 3rd contact the light seemed to flicker slowly (a bit like aperture flicker in a time lapse) as well as (I think) spotting some much faster shadow bands rippling on the ground in front of me. I think having an eclipse low in the sky also benefits from the 'moon illusion' with the corona seeming larger than I remember from 11 years ago with the eclipse high in a clear blue sky. In binoculars there were some beautiful prominences, and I was surprised by how much their visibility changed during the two minutes.



Two images are combined together here (left) at 2<sup>nd</sup> and 3<sup>rd</sup> contacts (by the editor), and were taken with 2 different lenses and cameras. A full disk image was made with a Williams Optics Zenthistar II 545mm f/6.4 (upper left) and a Canon 5D Mark II, and the lower right section was made with a Takahashi FS-102 and a 1.6x extender (giving 1300mm at f/13) and Canon 5D Mark II. Both were on tracking mounts. Below is Phil Hart with the FS-102 Takahashi.

All photos by Phil Hart



An award of some sort goes to the driver zooming along the Mulligan Highway (away from the sun) as though nothing unusual was happening, despite being less than two minutes from second contact with the light already very weird and fading fast. Who does that?? Were they going to turn their lights on to keep driving through totality!!?



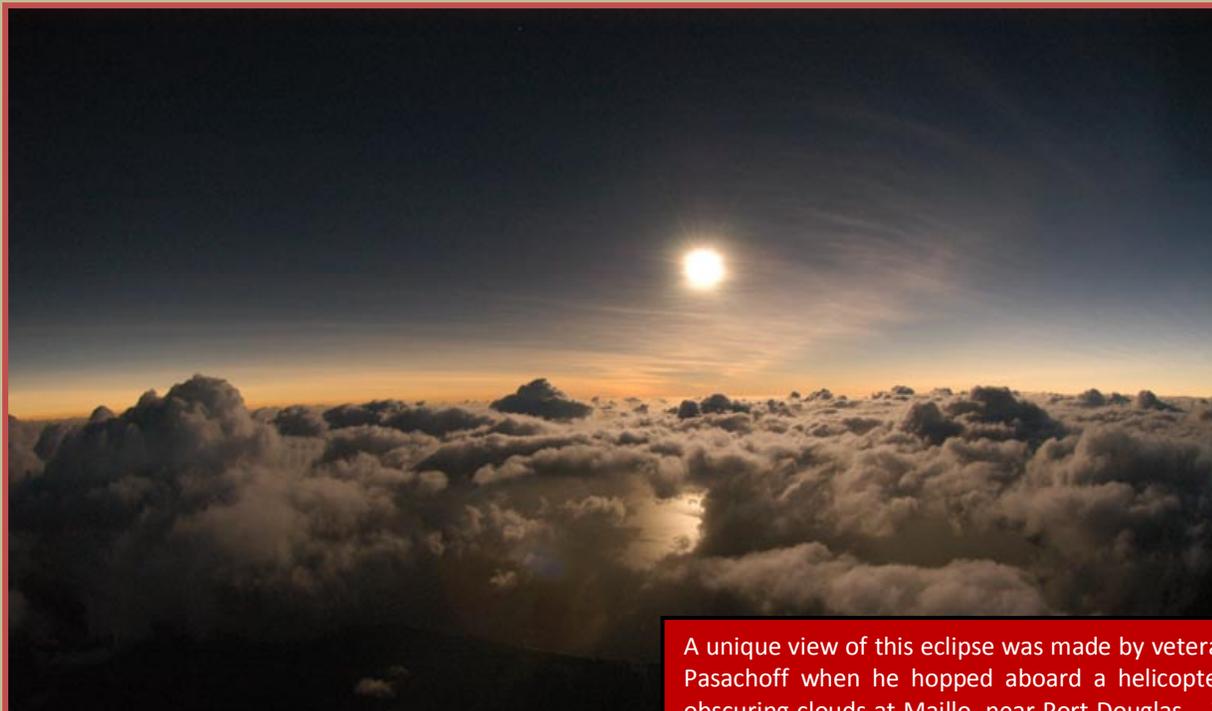
Phil thanks Dan Chubb, Gavan Salter and Chi for the loan of their gear that made all this possible!

Log onto Phil's web site (using the icon at left or [here](#)) to watch the excellent movie made from high resolution still images of the eclipse taken with the Takahashi instrument pictured on this page and to see with other images of the eclipse in higher resolution than we can offer here.

# THE COAST

## The Williams College Helicopter and Other Eclipse Photography

by Jay Pasachoff, Williams College (Williamstown, MA) and Caltech (Pasadena, CA)



A unique view of this eclipse was made by veteran eclipse chaser Jay Pasachoff when he hopped aboard a helicopter to get above the obscuring clouds at Maillo, near Port Douglas. The Moon's shadow is easily seen in the wide field image of the helicopter cockpit. All images in this article are used by permission and are © by Jay Pasachoff.

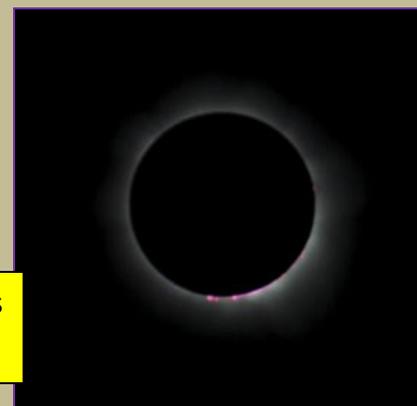


When my wife, Naomi, and I, accompanied by Rob Lucas from Sydney, went to Port Douglas and environs about two years ago to reconnoiter and to find an eclipse site or sites, we were accompanied and helped by Terry Cuttle, who had chosen some possible locations. We also had the advice of Sharon Grey, an amateur astronomer from Sydney, who recommended Executive Retreats as the source of possible rental houses.

We finally rented condos in both Trinity Beach and Port Douglas, as well as a very nice house in Miallo, about 20 km north of Port Douglas. The house was on a hill about 5 km inland, and had a sweeping view over Newell and the ocean. We planned to use it as our main site, both for my group of professional scientists and students and for my tour group ([www.aclassictour.com](http://www.aclassictour.com); see that site also for our plans for Gabon for the 2013 total solar eclipse). We were also accompanied there by Sharon Grey and her husband, Jeff Hall; by Australian National University solar astronomer Lawrence Cram and his wife, Barbara; by University of Massachusetts-Boston professor Edw. Ginsburg, and others.

The house had a heliport behind it--or at least a large grassy area between the house and its tennis court. Of course, we watched the clouds at sunrise every morning; you can see various images, as well as a movie of the clouds on eclipse day from Trinity Beach, at my website at [www.williams.edu/astronomy/eclipse](http://www.williams.edu/astronomy/eclipse).

For video, see [www.youtube.com/ansibletech](http://www.youtube.com/ansibletech); it is also linked through the Williams College site at <http://web.williams.edu/astronomy/eclipse/eclipse2012/>.





One of my colleagues at Miallo was Ron Dantowitz of the Clay Center Observatory (Brookline, MA.) When the weather was looking very iffy a couple of days in advance, he encouraged me to look into renting a helicopter to stand by. Though I was skeptical at first, I made the telephone call, and we did arrange to have the helicopter fly in the morning of totality and be available for the eclipse. My wife and I visited the helicopter's headquarters in Port Douglas, and stopped at the airfield north of Port Douglas to assess how far the windows opened. We asked about flying with the door off, but it would have limited the number of passengers even more: from 3 down to 2.

The day before the eclipse, half my people with about half the equipment reconnoitered westward, on the Tablelands near Mt. Carbine, and early on eclipse morning went there. Joined by my student Muzhou Lu '13 and most of the people in the tour group, we stuck it out at Miallo.

When it really looked cloudy about 20 min before totality, we ran to the helicopter and took off, spiraling upward over Miallo. (We were paying for rotor time, so we didn't want to be aloft any longer than we had to be.) I had with me a Nikon D3x borrowed from Nikon Professional Services, of which I am a member, and on it I had my 80-400 mm Nikkor VR zoom lens, where the VR stands for "vibration reduction," and allowed a couple of extra f/stops of sharpness. I also had a 10-mm Nikkor fisheye lens on a Nikon D100, both borrowed from Williams College's Equipment Loan Center.

On the flight, I was accompanied by Rob Lucas and by Roshan Samarasinghe, a researcher from the BBC who acted as cameraman, which is making a documentary on The Sun to be aired this spring, with the first few minutes devoted to the eclipse, including an interview with me that we had filmed a couple of days earlier.

As totality began, I photographed alternately with the two cameras. (We forgot to tell the pilot to stop spiraling.) I haven't seen Rob's helicopter images or the BBC's video, which included views from a small camera they affixed just above the front windshield looking back at me working. I was in a front seat (next to the pilot), able to shoot out of the open half of the window. Rob and Roshan were in the back.

I was very pleased with the sharpness of the images even at the 400-mm telephoto setting, thanks to the VR. And the wide-angle views were almost as gorgeous as the glances I stole during totality were.

My colleagues Bryce Babcock, accompanied by graduate student Alec Engell from Montana State University, and Ron Dantowitz, accompanied by his Dexter School student Nicholas Weber, got excellent observations from their Tablelands site. We are working to use these images and spectra plus my helicopter images to put together with a variety of spacecraft images as part of my research on the two central solar eclipses of 2012 (I had used the Jansky Very Large Array in New Mexico to observe radio features on the Sun at high resolution, with colleagues Tim Bastian and Dale Gary at the May annular eclipse). This 2012-eclipse research is sponsored by the Solar Research Program of the Atmospheric and Geospace Sciences Division of the U.S. National Science Foundation. For the spectra, we are working with John Seiradakis and Aris Voulgaris from Thessaloniki, Greece, with whom I have worked before on the coronal temperature as measured from the ratio of coronal emission spectral lines; their site at Newell Beach, unfortunately, saw only clouds. My colleagues Aram Friedman and Michael Kentrianakis at Trinity Beach, as well as our alumna Amy Steele, who we brought on my NSF grant to work there with Alphonse Sterling of NASA's Marshall Space Flight Center, got several seconds of totality; Amy got a nice still photo.

## CLIFTON BEACH

### THE RETURN OF SHADOW BANDS ON THE CLOUDS?!

During TSE2010, shadow bands were imaged on the clouds in Hao, Tatakoto, and Easter Island (see issue 11). Would the phenomenon “ever” make a repeat performance? Likely the conditions must be practically identical to those in 2010 to have a repeat performance, and since this was the first time shadow bands were seen in the clouds in eclipse history, was there really a serious possibility? Indeed clouds were prevalent along the coast of Far North Queensland, and also further inland in the Maitland and Mt. Carbine regions.

Some observers did report seeing normal shadow bands visible on the ground, both on land (and as you will read further) on aboard ship. There was a light layer of clouds at the inland sites, but there were no reports or images indicating shadow bands in the clouds from these locations. Along the coast however, the clouds were heavier and often a prominent cloud even obscured the eclipsed Sun in some locations. With the thousands that lined the coast, hundreds of photographers had a very good chance to image the total eclipse, but the question is, were conditions right for the return of the shadow bands in the clouds that was visible in 2010?

Of the tens of thousands of eclipse photos taken in Australia, we know of one particular location where shadow bands were indeed imaged onto the clouds. Two photographers in particular traveling with the [EclipseTours.com](http://EclipseTours.com) / *Ring of Fire* tour group appears to have captured the remarkable phenomenon at Clifton Beach, and not just during 2<sup>nd</sup> contact, but also 2 minutes later during 3<sup>rd</sup> contact, and I can tell you the two do not always go hand in hand. The photographers were Byron Braswell and Gene Stansbery.

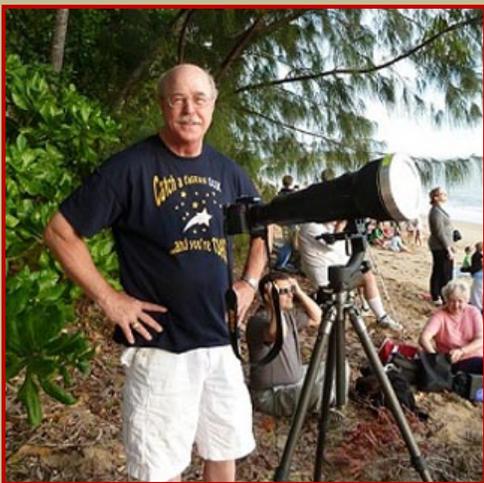


Shadow bands projected onto the clouds at Clifton Beach, Australia.  
© Gene Stansbery and used by permission by Ring of Fire tours.

The clouds at Clifton Beach were thicker than those inland, and most similar to that for the 2010 solar eclipse. In Tatakoto we were very lucky to even see totality as there were a significant number of clouds around that morning, and even obscuring totality for a brief few seconds, obviously enough during the eclipse to reveal shadow bands cast onto the clouds. The situation was similar at Clifton Beach.



Third contact showing shadow banding as imaged from Clifton Beach, Australia. Shot with a Nikon 600 mm f/4 lens, and a Nikon 1.7 multiplier resulting in a 1000 mm focal length at f/6.3 (1500 mm equivalent for the DX format Nikon D7000 camera used to make these images). Shot at ISO 400. Exposure times were 1/200 sec for 2<sup>nd</sup> contact (left) and 1/400 sec for 3<sup>rd</sup> contact (right). © by Byron Braswell and used by permission by Ring of Fire tours.



Byron Braswell (left) poses with his 600 mm lens, 1.7 multiplier and Nikon D7000 camera.

The shadow bands in the clouds are best seen in photographs that are slightly overexposed when imaging at 2<sup>nd</sup> and 3<sup>rd</sup> contacts, when the prominences are somewhat washed out. There has to be a certain amount of cloudiness to make shadow bands in the clouds even happen, but questions remain such as; Is there a certain altitude that this must occur at? Does it have to be a certain amount of humidity? How dense do the clouds have to be? Is there a certain exposure index that needs to be used to freeze the shadow bands in place and not make them just meld together into a contiguous form? Could it be a digital artifact?

If you took images within the seconds before 2<sup>nd</sup> contact and/or just after 3<sup>rd</sup> contact and there were clouds nearby or even partially obscuring the Sun, you may have a hint of shadow bands in the clouds, so go back and look carefully; they can sometimes be easy to overlook. A little bit of Photoshop processing may also be able to stretch the contrast to show the bands better. If you do find any, please let the editor know, along with the location, camera, ISO and shutter speed(s), and I will get them to individuals interested in studying this very new phenomenon.

# RING OF FIRE EXPEDITIONS



Photo by Paul Maley

The Ring of Fire Expeditions may not have been the largest organized tour in Australia, but it did have four groups along the eclipse path, one each near Mt. Carbine (top left and right), Clifton Beach (bottom right) and on the cruise ship Dawn Princess (bottom left). A small contingency was at the beach near the Hotel Mercure, and these individuals were the only ones that did not see any totality in this entire group.



Koala (left) and Ayers Rock (right),  
© Larry Stevens



Photo by Barbara Verkaart

## MacKAY CAY, GREAT BARRIER REEF

Veteran eclipse chaser Patrick Poitevin and his wife Joanne found one of the best observation locations anywhere. Just offshore from Cape Tribulation was a small piece of sand called MacKay Cay, about 20 kilometers off the coast, as part of the Great Barrier Reef. Without a doubt, they were the last observers on land to view the eclipse! This was Patrick's 40<sup>th</sup> solar eclipse, and his 19<sup>th</sup> total.



MacKay Cay, Great Barrier Reef, image from Ocean Safari

**by Patrick Poitevin (edited version extracted from his eclipse blog and used with permission)**

For our trip in Australia, we set off in the north traveling in a camper van and Cape Tribulation stole our hearts. Here beautiful rain forest and amazing landscapes thrive. Cantering on horses in the woods and on the beach ... Being on the coast we booked ourselves for snorkeling in one of the best places in the world: the Great Barrier Reef. From the Cape Tribulation area, Ocean Safaris was the only provider to go off shore. 20 kilometers offshore we found Mackay Cay reef island, and it offers half day snorkeling. We have our own gear and have been snorkeling at many places in the world. This is the best!

Ocean Safaris [tours] offered an early morning raft trip to the Mackay Cay sand reef island to observe the eclipse, leaving at 5h in the morning and return after 4th contact. Damn! That is a once in a lifetime opportunity. Never will we have the possibility to observe an eclipse from a sandy reef island, the size of a tennis court in the ocean! It had been cloudy now and then, [and sometimes] rainy the few mornings before [the eclipse]. Even in a cloudy sky, observing darkness from the reef sandbank would be unique!



We made arrangements with the crew and they were over the moon we joined [the group, being] experienced eclipse chasers. They picked us up at 04h30 from the camping area; including the 2 of us we were with 13 on the raft, [we loaded the] telescopes and cameras on board. The night before, and also eclipse morning, there were clear skies! Too good to be true! Wow. On our bumpy ride, we observed sunrise and before we could set up the gear, first contact had already begun.

It was clear, but here and there we had some small clouds. As long as they would not be in front of the sun at totality [we would be happy]. It was unique, it was

exotic, it was so special! [We had a distant] horizon for 360 degrees, [and I had] never had that for any solar eclipse or any astronomical observation before.

We had two C90 (Celestron) telescopes with us of which one was on the same tripod with the 1000 mm video camera parallel. [We had] a Nikon camera for general photography and 2 iPhones for some panoramic pictures. The crew [was] equipped with welding helmets and eclipse glasses.

Halfway through the partial phase, Peter, owner of Ocean Safaris, noticed correctly that the sky had got darker and colours became eerie. The first phase went so fast. Soon the Sun was a small crescent. We showed the crew [the view] in the scope and let them take pictures through the eyepiece.

We saw Baily's beads, long diamond ring and bright long chromosphere. Totality would be 1m25s for this location. Still amazed by the 360 degree view and observing totality with the naked eye, I realized that the solar filter was still on the scope. The view was amazing and prominences [were visible] at 11h and 5h [positions]. All too soon we saw the chromosphere and diamond ring, and the Sun appeared once again.



Celebrating yet another successful eclipse with Champagne, Joanne and Patrick are pictured here kneeling, glasses together.

I did not notice the shadow cone coming in or going out. The 360 degree horizon was rather bright and the eclipse was not that very dark. We did not see any shadow bands. Venus appeared at totality but still could be seen about 5 minutes after totality. I probably did not see it earlier due to small clouds at that spot and the rather bright sky. [We did] not see Saturn or Mercury either, but again, it was not a dark eclipse. The corona was bright and rather symmetrical. No obvious strong streamers and very much as the predicted corona shape [that was] published a few days before.

During the second phase the crew provided champagne, sandwiches and loads of fresh exotic fruit. We reviewed the video footage and watched through the scope as the sunspots reappeared one by one.

Due to the excitement we forgot totally about the high tide, which would be 3 meters at about 9h. All of a sudden, a big wave came all over our gear while we were packing up [that reminded us, however]. What a unique eclipse. Could not celebrate better for my 40th solar eclipse observation! We went back to Cape Tribulation with the raft, completely satisfied and had a fry up breakfast served by Ocean Safaris. We could not resist [the urge] to go out again the same afternoon and snorkel around in this marine paradise once more. Very bumpy rides but worth the while!!!

His original blog is available at; <http://solareclipsespp.blogspot.co.uk/>, and more photos available at; <http://www.flickr.com/photos/73609454@N04/>



Panorama image taken at MacKay Cay with an iPhone. Used by permission and © Patrick Poitevin

## **- BRAMSTON BEACH -**

Eclipse chaser Fred Bruenjes was at Branston Beach, where he reported seeing 2<sup>nd</sup> contact and 15 seconds of totality before being engulfed by clouds.

## **- TRINITY BEACH -**

Broken clouds were visible before totality, but clouds covered the Sun for most of totality; with the exception of about 2 seconds where Xavier Juber and others caught a brief view of the corona. Some 20 minutes afterward the clouds dissipated and partial phases returned.

Also observing from the Vue Apartments were Aram Friedman and Michael Kentrianakis, part of Jay Pasachoff's expedition. Friedman subsequently compiled movies that showed the clouds and eclipse sequence through a hole in the clouds; they are available through YouTube by searching on Ansibletech. <http://www.youtube.com/user/Ansibletech>. From the same site, Amy Steele of Wesleyan University, a Williams College alumna, got an excellent eclipse image through a break in the clouds, supported by Pasachoff's National Science Foundation grant. Others at that Vue Apartments site included Miloslav Druckmüller (Czech Republic), Vojtech Rusin and Metod Saniga (Slovakia; supported by a grant from the Committee for Research and Exploration of the National Geographic Society), and Alphonse Sterling (NASA's Marshall Space Flight Center/Hinode team) and their teams.

## **- PALM COVE -**

A hole in the clouds moved into place for the 100 participants in a scientific eclipse conference to see totality.

## **- ROCKY POINT -**

Eclipse Chaser Rick Brown reports that they were able to see about 6 seconds at C2 and 5 seconds of totality just before C3 at Rocky Point.

## **- CAIRNS -**

Bertrand Teyssier reported that totality was obscured by clouds at the Cairns Esplanade, which cleared off about 20 minutes after totality, and remained clear the rest of the day. "During totality, Venus could be seen. The sky was distinctly blue (rather than black or navy) with nice colours along the horizon. It was the most colourful sky I have seen during a total eclipse."

## **- GREEN ISLAND -**

Steve Walton traveling with Sita Tours reported taking a catamaran in the pre-dawn hours from Cairns out to one of the few islands along the Great Barrier Reef, Green Island. Hundreds of other observers were on hand and during the partial phases an occasional cloud would drift across the Sun, but totality was "completely in the clear and spectacular". Author Dava Sobel was also successful observing totality from this site.

## **CRUISE SHIPS IN THE CORAL SEA**

### **- CELEBRITY MILLENNIUM -**



The Celebrity Cruise ship Millennium departed Hilo, Hawai'i on November 3, stopped off in Fiji, and viewed the eclipse north of New Zealand, afterward visiting New Zealand and on to Sydney.

Observers watching the eclipse reported seeing shadow bands up to 90 seconds prior to 2<sup>nd</sup> contact. It was also reported that Venus was visible about 5 minutes before totality, not the usual 10 minutes as Venus was only -3.9 magnitude as it was receding from the Earth as it was starting to round the Sun, and had a smaller crescent profile. A few minutes after totality saw some moderate clouds move in for observers.

### **- DAWN PRINCESS - PRINCESS CRUISES -**

The Dawn Princess was successful in viewing totality positioned just off the coast of Port Douglas.

### **- MV ORION -**

The MV Orion was a short distance off Cairns near Green Island. Veteran eclipse chaser and eclipse weather forecaster Jay Anderson reports; "The coronal plumes were marvelous, with a few bright prominences and a dramatic beaded chromosphere. Shadow bands put in a beguiling performance [both] before and after totality. Can't say I've enjoyed an eclipse more than this one."

### **- OOSTERDAM - HOLLAND AMERICA -**



Between New Caledonia and Australia, Holland America's ship the Oosterdam positioned itself for the eclipse. First contact was observed, as was 2<sup>nd</sup> contact, but only about 1 minute of the potential 2½ minutes of totality was visible due to clouds.

### **- PAUL GAUGUIN -**

Leaving from Fiji, the Paul Gaugin was no newbie to eclipse chasing, and since 2005 has now been in the path of totality no fewer than 4 times, as eclipses have been prevalent in the South Pacific Ocean. Observers aboard the ship included eclipse chaser Bill Kramer, who watched south of New Caledonia. The ship dodged clouds by turning north away from the centerline to outrun a closing cloud bank, reducing the duration of totality to 3m 01s. Vanuatu and New Caledonia were ports of call before returning to Fiji.

### **PACIFIC JEWEL - P & O CRUISES -**

Bad timing was the bane of the Pacific Jewel, which missed the centerline by 3 hours and the edge of the path by just 1 hour. All aboard were deprived of totality entirely. This is one of the reasons that you cannot always sign up on cruise lines (or travel groups offering eclipse trips) advertising that they will have viewing of an eclipse when they are not associated with a seasoned eclipse tour group that can help with the cruise line to be sure the timing works out. It is one thing to be in the path when totality arrives and clouds obscure the view, but not to even be in the path, that is really poor planning unless there are extenuating circumstances.

## eFLIGHT 2012

A few months ago, eclipse chaser extraordinaire J. Beattie set into action yet another eFLIGHT. A small contingent boarded a King Air 350i turboprop and departed from Auckland, New Zealand for the flight out over the South Pacific and headed in the direction of longest duration of totality. Among those on the flight, including John, were George Sieg and Craig Small, also from the USA, Florence Yeung of French Polynesia (Tahiti), and Oreste Pinto, Maranu Gascoigne and Gavin Logan all of New Zealand. The aircraft was flown by Capt. Peter Oberschneider and First Officer Alistair Matthews for Golden Wings, Ltd.

East of the North Island of New Zealand, the plane had climbed to 35,000 feet and entered the Moon's umbra at 21:33:00, and experienced C3 at 21:37:30, experiencing 4m 30s of totality at a point near 177.52 west longitude and 34.37 south latitude. The airspeed was about 290 knots with the Sun at 59 degree elevation. The plane then returned for a landing at Gisborne. The entire trip lasted 3½ hours.

Below - One of the best images I have seen illustrating the "silver light" as Peter calls it, just seconds before totality when the light from the Sun takes on a "cool," rather than its usual warm tone. This is the bottom 2/3rds of a fisheye view seen at Four Mile Beach in Port Douglas. Imaged with a Canon 5d Mark II, using a 8-15 mm zoom fisheye lens set at 8mm, 1/13th sec @ f/4.0, ISO 200. Image by Peter Ward.



# FUTURE ECLIPSES IN AUSTRALIA + NEW ZEALAND

Eclipse Chasers rarely plan just for the next eclipse, they plan for ALL of them! Australia and New Zealand start to come into an era where they will be good locations for total (with a couple of annular eclipses tossed in) eclipses in the coming decades. In the '00 to '09 decade there was one total solar eclipse in Australia. The '10 to '19 decade will again have just one total solar eclipse, followed 6 months later by an annular solar eclipse, which crosses the path of the previous TSE similar to the 2012 and 2013 eclipses. The '20 to '29 decade sees two total eclipses, one of which is actually a hybrid eclipse, but it encounters a very small area of Australia, where it will be a total eclipse delivering a glancing encounter on the westernmost coast of Australia, and one that is visible in nearly every province/territory of Australia, including making an appearance in Sydney! The '30 to '39 decade will see 4 central eclipses, 3 totals and one annular. After this there will be two decades without a central eclipse in the land of Oz, which will not see another total until 2066!



HSE2023	APR 20	Total on the west-northwestern coast of Western Australia
TSE2028	JUL 22*	Slices diagonal and includes all proveniences except Victoria
TSE2030	NOV 25	South Australia, NSW, with sunset in Queensland
TSE2037	JUL 13*	Touches all proveniences except Victoria
TSE2038	DEC 26*	Western Australia, South Australia, NSW and Victoria

It is obvious during this decade and a half period that this area of the Earth will be very popular.

- **HSE2023 (April 20)** is only annular at the very beginning and end of the path, but in between it is total, and this is where it clips Western Australia at the North West Cape Peninsula (1m 02s) and several islands along the coast, including the largest, Barrow Island (1m 05s)
- In **TSE2028 (July 22)** the path takes totality directly over the city of Sydney (3m 49s), but on the opposite end of the path of totality soon after it passes onto land will be the longest duration (5m 10s), 1m 20s longer than that in Sydney. Totality crosses the South Island of New Zealand (2m 55s).
- **TSE2030 (November 25)** enters Australia from the Great Australian Bight, and nearly parallels the path of TSE2002, but goes a little further into the interior and falls short of the east coast not far from Brisbane as sunset falls.
- **TSE2037 (July 13)** sees the path of totality pass directly over Uluru (3m 11s), also known as Ayers Rock. 3m 58s is the longest duration of this eclipse several hundred kilometers east of Uluru. Totality is visible near the northern limit in Brisbane (1m 17s), but a drive down the coastal highway will bring you to a view lasting 3m 31s. The eclipse passes squarely across the North Island of New Zealand (2m 24s).
- **TSE2038 (December 26)** has the path of totality north of Adelaide (1m 53s) and also north of Melbourne (2m 04s), and the longest duration occurs on this day after Christmas in the Tasman Sea (2m 18s) on its way to encounter New Zealand. The path passes slightly north of Wellington (2m 13s).

2000–2009

TSE2002 DEC 04 South Australia, ending as it barely enters NSW & Queensland near or at sunset

2010–2019

TSE2012 NOV 13 Queensland near sunrise (includes Cairns)

ASE2013 MAY 10 Western Australia, Northern Territory and Queensland (just north of Cairns)

2020–2029

HSE2023 APR 20 Total on the west-northwestern coast of Western Australia

TSE2028 JUL 22\* Touches all proveniences except Victoria

2030–2039

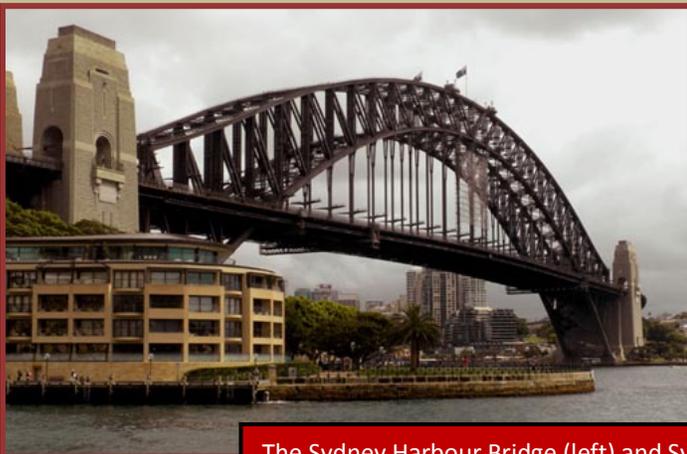
TSE2030 NOV 25 South Australia, NSW, with sunset in Queensland

ASE2035 MAR 09\* Misses Australia completely, narrowly missing Tasmania

TSE2037 JUL 13\* Visible in all proveniences except Victoria

TSE2038 DEC 26\* Western Australia, South Australia, NSW and Victoria

\* The path of totality / annularity is also visible in New Zealand for these eclipses



The Sydney Harbour Bridge (left) and Sydney Opera House (right). Images © Larry Stevens

# Short eclipses for the next decade+

After a string of longer duration total eclipses, we will have a string of shorter eclipses, at least for those viewing from land. So be prepared to rack up your durations by smaller increments than we have had lately.

Although TSE2012 had a maximum duration of **4m 20s**, it occurred in the far South Pacific Ocean, east of New Zealand. On land the longest the eclipse duration was **2m 02s** along the Queensland coast in northeastern Australia.

**HSE2013** - The longest totality on land will occur on the coast of Gabon (Africa), with only **1m 08s**, but even if you were at sea in the Atlantic Ocean, the duration would only be **1m 40s**. This eclipse however being a hybrid eclipse will have a **0s** duration at sunrise in the Atlantic Ocean south west of Bermuda, or about **10s** in Kenya, Africa.

**TSE2015** - With weather not looking too good in the north Atlantic Ocean, the only land for this eclipse would be on the Faroe Islands with **2m 24s**, Svalbard **2m 28s**, or the polar ice sheet, maximum duration occurs just north of the Faroe Islands with **2m 47s**.

**TSE2016** - **3m 20s** is the most you would be able to view from land on Maluku Utara in Indonesia, short of the **4m 09s** duration at maximum, which once again will be at sea over 400 kilometers southeast of Guam.

**TSE2017** - In the USA you will be able to position yourself directly under the point of maximum duration in southern Illinois; however, the extent of totality is only **2m 40s**

**TSE2019** - In Chile, observers will get up to **2m 36s** on the west coast out of a **4m 33s** maximum duration visible in the south Pacific.

**TSE2020** - The path of totality sweeps mostly across the south Pacific and South Atlantic Oceans, but fate has it that maximum duration does occur in southern Argentina, where only **2m 10s** will be visible.

**TSE2021** - occurs in Antarctica, and solar eclipses here are always very brief but the maximum duration is not far enough off of land to make a real difference in this duration of **1m 54s**.

**TSE2024** - The first eclipse visible from land in excess of 4 minutes duration occurs in Mexico and the USA with a maximum of **4m 28s**. Even in the U.S. the duration is greater than 4 minutes for 2/3rds of its path. This is the first in 14 years that a total solar eclipse longer than 4 minutes reaches land.

**TSE2026** - Maximum duration again occurs in the ocean, just off the west coast of Iceland with **2m 18s**. If weather conditions are good enough, observers near some of the glaciers in east Greenland (if there are any left by this time :-)) will get **2m 18s** or off the centerline in western Iceland will have **2m 13s** of totality.

In all, land observers have a potential of 25m 00s of totality from land, and 30m 59s from the sea for this timeframe.

At long last, another saros cycle will bring us around to the long-duration sequence following 1973, with the following long eclipses of 1991, 2009 leading to **TSE2027**, where maximum duration occurs in Egypt, with **6m 28s** of totality. Don't plan on observing from the Great Pyramid of Khufu in Giza though, unless you want to observe a 95% eclipse as you'll be about 100 kilometers off the path of totality. Totality however does pass directly over Luxor, the ancient capital of Egypt, and the location where King Tutankhamun's tomb was discovered.

## Now Booking: 2013 Total Solar Eclipse

# ~ AFRICA ~



Eclipse Guide: Prof Jay Pasachoff

### [2013 Solar Eclipse Tours | Option 1 | Morocco & Gabon](#)

October 21 to November 05 / \$4770.USD / 16 day tour

### [2013 Solar Eclipse Tours | Option 2 | Senegal, Ghana & Gabon](#)

October 21 to November 05 / \$4335.USD / 16 day tour



Eclipse Guide: TBA

### [Total Solar Eclipse – Option 1](#)

October 30 to November 06 / £2287.GBP / 7 day tour

Arrival & Departure point: Kampala, Uganda

View eclipse from 3 possible locations, between 19 and 17 seconds duration

### [Total Solar Eclipse – Option 2](#)

October 30 to November 09 / £2773. GBP / 10 day tour

Arrival & Departure point: Kampala, Uganda

View eclipse from 3 possible locations, between 19 and 17 seconds duration

### [Total Solar Eclipse – Option 3](#)

October 30 to November 08 / £3818. GBP / 9 day tour

Arrival & Departure point: Kampala, Uganda

View eclipse from 3 possible locations, between 19 and 17 seconds duration

### [Total Solar Eclipse – Option 4](#)

October 30 to November 08 / £3818. GBP / 12 day tour

Arrival & Departure point: Kampala, Uganda

View eclipse from 3 possible locations, between 19 and 17 seconds duration



### [Gabon 2013 Solar Eclipse Tour](#)

October 31 to November 03 / \$2995.USD / 4 day tour

Arrival & Departure point: Libreville, Gabon

View the eclipse from north of Lambaréné, Gabon (potential 1m 06s)



[Uganda – Kenya](#)

TBA



[2013 Kenya and Lake Turkana](#)

October 30 to November 05 / \$5950 / 7 day tour

Arrival and Departure point: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana, Duration: 0m 15s

[2013 Kenya Safari](#)

October 27 to November 05 / \$8950 / 10 day tour

Arrival and Departure point: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana, Duration: 0m 15s

[2013 Ethiopia Eclipse Tour](#)

October 24 to November 08 / \$5775 / 16 day tour

Arrival and Departure point: Addis Ababa, Ethiopia

View the eclipse from south of Yabelo, Duration: 0m 08s

the independent traveller

[Total Solar Eclipse in Kenya](#)

October 30 to November 05 / NA / 7 day tour

Arrival and Departure point: Nairobi, Kenya

Viewing from near Kalko (Lake Turkana): 0m 15s duration



[African Total Solar Eclipse](#)

Eclipse Expert: Dave Eicher, Editor Astronomy Magazine

October 31 to November 12 / NA / 13 day tour

Arrive: Libreville, Gabon – Depart: Casablanca, Morocco

View the eclipse from south of Libreville

Airfare is included from JFK Airport; other locations may require additional airfare

[Kenya Total Solar Eclipse](#)

October 28 to November 10 / NA / 14 day tour

Arrival and Departure point: Nairobi, Kenya

Airfare is included from JFK Airport; other locations may require additional airfare

View the eclipse from the shores of Lake Turkana



Eclipse Guide: Fred Espenak

**[Eclipse in Kenya – STR0001](#)**

October 30 to November 10, \$9860.USD, 12 day tour

Arrival & Departure point: Niarobi, Kenya

View the eclipse from the eastern shore of Lake Turkana, Duration: 0m 15s



**TotalSolarEclipse.com**

**[2013 Hybrid Total Solar Eclipse in Kenya – Western Side 7 Days Eclipse Safari – Tour 001](#)**

October 30 to November 05 / \$4480.USD / 7 day tour

Arrival and Departure: Nairobi, Kenya

Viewing on the western shores of Lake Turkana: 0m 15s

**[Total Solar Eclipse – Sibiloi National Park 9 Days – Tour 002](#)**

October 30 to November 09 / \$4678.USD / 9 day tour

Arrival and Departure: Nairobi, Kenya

Viewing on the western shores of Lake Turkana: 0m 15s

**[2013 Hybrid Total Solar Eclipse in Kenya – Western Side 9 Days Eclipse Safari – Tour 003](#)**

October 27 to November 05 / \$4800.USD / 9 day tour

Arrival and Departure: Nairobi, Kenya

Viewing on the western shores of Lake Turkana: 0m 15s

**[Total Solar Eclipse – Sibiloi National Park 11 Days – Tour 004](#)**

October 25 to November 04 / \$8350.USD / 11 day tour

Arrival and Departure: Nairobi, Kenya

Viewing on the western shores of Lake Turkana: 0m 15s

**[Total Solar Eclipse – 5 Day Eclipse Safari – Tour 005](#)**

October 27 to November 05 / \$4960.USD / 9 day tour

Arrival and Departure: Nairobi, Kenya

Viewing on the western shores of Lake Turkana: 0m 15s



**[2013 Ethiopia Total Solar Eclipse](#)**

October 24 to November 8 / \$8805.USD / 16 day tour

Arrival and Departure: Addis Ababa, Ethiopia

View the eclipse from south of Yabelo, Ethiopia: 0m 09s duration

**[Kenya Safari and Eclipse](#)**

October 26 to November 5 / \$9350.USD / 11 day tour

Arrival and Departure: Nairobi, Kenya

View the eclipse from Sibioli National Park, on the east shore of Lake Turkana: 0m 12s duration

### [Kenya Safari and Uganda Eclipse](#)

October 26 to November 5 / \$7700.USD / 11 day tour

Arrive: Nairobi, Kenya / Depart : Kampala, Uganda

View the eclipse from Pokwero Village : 0m 19s duration

>> Check out the Atlantic Ocean Tours for more TravelQuest 2013 eclipse trips <<



### [Lake Turkana Solar Hybrid Safari](#)

October 30 to November 05 / \$3100 / 7 day tour

Arrival and Departure point: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana, Duration: 0m 15s

### [9 Days Hybrid Solar Eclipse Safari](#)

October 28 to November 05 / \$3940 / 9 day tour

Arrival and Departure point: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana, Duration: 0m 15s

### [10 Days Lake Turkana Hybrid Solar Eclipse Safari](#)

October 30 to November 05 / \$4278 / 10 day tour

Arrival and Departure point: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana, Duration: 0m 15s



Tropical Sails Corp

### [Kenya Solar Eclipse Safari](#)

October 24 to November 05 / \$4295.USD / 12 day tour

Arrival and Departure: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana: 0m 11s duration

### [Kenya Solar Eclipse Tented Safari](#)

October 29 to November 05 / \$2389.USD / 8 day tour

Arrival and Departure: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana: 0m 11s duration

# ~ ATLANTIC OCEAN ~

Betchart Expeditions INC.



## Atlantic Crossing Solar Eclipse

October 18 to November 10 / \$5495.USD + \$260.USD Port Charges / 24 day tour

Arrive: Las Vegas, NV – Depart: Las Vegas, NV

View the eclipse from the 4mast ship *Star Flyer*:

Includes round trip air from JFK or MIA



Eclipse Guide: Dr. Patricia Reiff, Professor of Astronomy at Rice University in Houston, Texas

## Total Eclipse of the Sun Over the Atlantic Ocean

October 28 to November 09 / \$4469.USD / 13 day tour

Arrive: Santa Cruz de Tenerife, Canary Islands – Depart: Bridgetown, Barbados

View from the central Atlantic Ocean aboard the Yacht *Sea Dream I*, Duration: 1m 09s



## Total Solar Eclipse of 2013: Morocco to Cape Verde

Eclipse Guide: Dr. Alex Filippenko, PhD, Professor of Astronomy at U. C. Berkley

October 22 to November 06 / \$8495.USD / 16 day tour

Arrive: Casablanca, Morocco – Depart: London, England

View the eclipse from the cruise ship *Island Sky* south of Cape Verde Islands, Duration: 1m 21s

## Total Solar Eclipse of 2013: Spain to Sierra Leone

Eclipse Guides: Dr. Rick Fienberg

October 22 to November 05 / \$9980.USD / 15 day tour

Arrive: Malaga, Spain – Depart: Freetown, Sierra Leone

View the eclipse from the cruise ship *Corinthian* southeast of Freetown: 1m 30s duration

## South America Classic Tours

### Eclipse Tour Kenia – Tour 01

October 29 to November 08 / €3590.EUR / 11 day tour

Arrival and Departure: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana. Kenya: 0m 11s duration

### Hybrid Solar Eclipse Tour – Tour 02

October 24 to November 05 / €6375.EUR / 12 day tour

Arrival and Departure: Nairobi, Kenya

View the eclipse from the shores of Lake Turkana. Kenya: 0m 11s duration



**[2013 West Africa Total Solar Eclipse Cruise: Spain to Sierra Leone](#)**

Eclipse Guide: Dr. Rick Fienberg

October 22 to November 5 / \$9980.USD and up / 15 day tour

Arrive: Malaga, Spain – Depart: Freetown, Sierra Leone

View the eclipse from the cruise ship Corinthian: 1m 30s duration

**Coming Soon: 2015 Total Solar Eclipse**



Eclipse Guide: Prof Jay Pasachoff

**[2015 Solar Eclipse Tours | Svalbard](#)**

TBA



**[High Arctic Total Eclipse \(Svalbard\) – Code EXSV](#)**

Eclipse Guide: Dr. John Mason

March 17 to 25 / \$4811.USD and up / 5 day tour

Arrival and Departure point: Oslo, Norway

the independent traveller

**[Total Solar Eclipse 2015 – Faroe Islands](#)**

March 19 to 23 / NA / 5 day tour

Arrival and Departure point: London, England

responsiblevacation.com

**[Solar Eclipse Vacation in the Arctic, Spitzbergen](#)**

Eclipse Guide: Dr. John Mason

March 18 to 21 / \$3777.USD / 4 day tour

Arrival and Departure point: Longyearbyen, Spitzbergen

## TOUR GROUPS LISTINGS > DISCLAIMER & ADVICE PAGE

At **TOTALITY!**, we have done a GOOGLE web search to find travel agents that are presently booking eclipse tours. Because they are listed here is in no way an endorsement for the veracity of any agent or agencies. We present these brief overviews for your convenience and to be a reference for your further examination to help you find the package that best fits your travel desires and prices. Please use the links to review all of the accompanying details about each trip.

Nearly ALL packages do NOT include airfare to and from your country of origin if other than the country you reside in, and visas are also extra, unless noted otherwise. Meals are sometimes included and sometimes not; please read these itineraries carefully. All prices listed are usually the starting price; single supplements (one person/per room) prices are usually notably higher, and I encourage anyone traveling alone to find a travel buddy so higher costs can be avoided. A good travel buddy will also watch your back, just like a diving buddy, and keep strangers at a distance when you are making an ATM withdrawal abroad.

Additional trip extensions are also often available.

There is a distinction between tour groups that specialize in eclipse and astronomical tours, and tour groups that are including the eclipse into either their regular tours, or perhaps have modeled a tour to take advantage of the eclipse in a region they often cover in their tours. As a rule, even the eclipse/astronomy tour groups frequently contract out to local tour groups familiar with the sites of the host country. The difference is when a tour group engages an experienced eclipse guide, the day of the eclipse, and even a couple of days leading up to the eclipse, in order to do anything within reason to get everyone to a location where the Sun will be visible at the time of totality, even if it means racing to find a hole in the clouds (heaven forbid), and even if it means moving the tour hundreds of miles in an attempt to view totality. That is why they call it “Eclipse Chasing.” Also, the eclipse guide can monitor the weather patterns, as well as describe the events of a total solar eclipse to first time eclipse chasers (FTEC’s). No matter what, plan to have a great sightseeing trip, and even if it is cloudy, you will still have had a fascinating tour.

If your group does NOT have an “eclipse leader,” and if you have eclipse experience, you may need to step up to be sure that on eclipse day, the focus is getting to and giving ample time for the experienced eclipse chasers to set up equipment. It is important to have a lot of time to set up and align your equipment, with plenty of time to spare.

In most cases expect there to be a fee for a visa to the country or countries you will be visiting, and some can be a fairly hefty sum, in addition to requiring you to acquire it months ahead of time, so the more countries, the more fees, and these are usually not included in your basic tour price. And almost always, the tour cost does NOT include your international airfare. Often your tour company can arrange your international flights, but with careful work, you may find better fees if you book yourself; it may, however, be difficult matching your arrival and departure times with that of the tour. In some cases, if you land in one country in order to get to another, even that short time in the airport may require another visa.

Whenever a gold star  is displayed, the tour group is one that specializes in eclipse and astronomy tours primarily, and will do their best at serving the eclipse chaser to their fullest abilities. Other eclipse tours are done by tour groups that do not always understand the intricacies and needs of eclipse chasers.

# ECLIPSE SPECIALTY TOUR GROUP WEB SITES ...

---



# OTHER USEFUL ECLIPSE WEB SITES ...

---



← NASA's Eclipse Web Site



← Fred Espenak's Eclipse Web Site



← Jay Anderson's Eclipse Weather web site



← Xavier Jubier's Web Site and Eclipse Maps

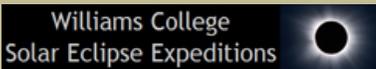


← Bill Kramer's Eclipse Chasers



← IAU Working Group on Solar Eclipses

Working Group on Solar Eclipses/Program Group on Public Education at Solar Eclipses



← Williams College and Jay Pasachoff



← Glenn Schneider's Web Site



← Eclipse2017.org set up by Dan McGlaun



← Jeffrey R. Charles Eclipse Chaser Journal



← Charlie Bates Solar Astronomy Project

# PERPETUAL ACKNOWLEDGMENTS . . .



Some materials in this publication, used with permission and thanks from/to . . .

Eclipse Predictions by **Fred Espenak**, NASA/GSFC

Eclipse Weather Predictions by **Jay Anderson**

Google Eclipse Maps and Predictions by **Xavier M. Jubier**

Additional Eclipse Maps by **Michael Zeiler**

And with special thanks to . . . **Prof. Jay Pasachoff**

---

Published and Copyright by Visions of Totality, Ltd.

Larry A. Stevens

5114 Walnut, West Des Moines, IA 50265-2828.

All photographs, diagrams and text herein are © by the originating authors and are used herein with their individual permission

To receive this publication, please e-mail me at [TOTALITYnewzine@aol.com](mailto:TOTALITYnewzine@aol.com) to be put on a list to be notified when a new issue becomes available. Your e-mail address will not be sold or given away, and all notices will be sent as a blind carbon copy so no one else can receive your e-mail address.

Resolution of this document: This document was originally created as a Microsoft Word document, and its original resolution is notably better than the document created with Adobe Acrobat, which is rather pixilated. With Acrobat Reader, anybody on a Mac or PC can access it. Some issues will occasionally use photos that have been posted to web sites that are saved at 72 dpi, and likely will not be as sharp as others posted at higher resolutions.

Please send any correspondence, suggestions or submissions of your own to [TOTALITYnewzine@aol.com](mailto:TOTALITYnewzine@aol.com).

Photo submissions can also be sent to the [TOTALITYnewzine@aol.com](mailto:TOTALITYnewzine@aol.com); please format @128 dpi.

