2010 FEB

TOTALITY!

THE JOURNAL FOR ECLIPSE CHASERS

eclipse travel adventures

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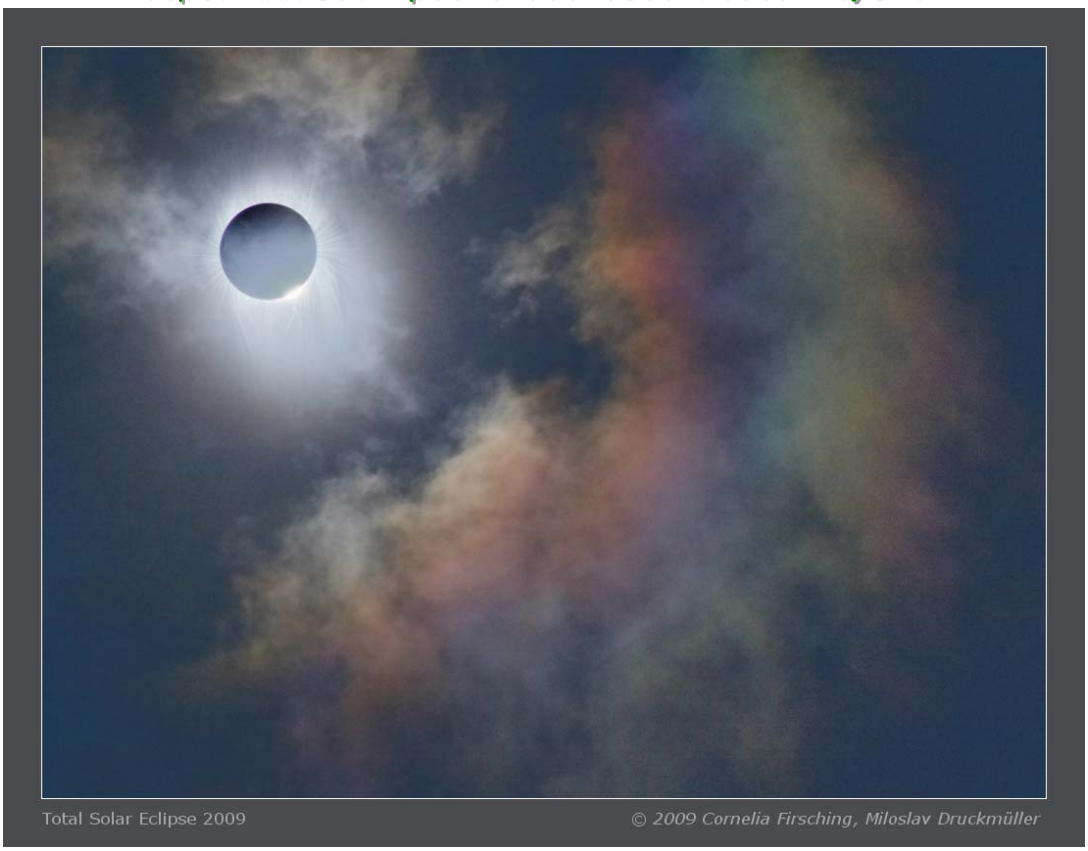
http://xjubier.free.fr/en/site_pages/Solar_Eclipses.html
and
http://www.eclipse-chasers.com/totality.html

ISSUE 10



Refraction of sunlight in the nearby clouds give a rainbow like appearance as the Sun emerged from totality on Enewetak atoll in the Marshall Islands
Imaged by Cornelia Firsching and enhanced by an inset of totality imaged by Miloslav Druckmüller
Image used with permission from Miloslav Druckmüller

In this Issue:

2009: Eclipse of the Century

Going into this eclipse, most of us knew the odds up front, and the best odds were slightly better than 50 percent for adequate weather. This area started on the coast of China near Shanghai and extended out into the Pacific Ocean. Odds were slightly lower further inland, but that did not stop people from flocking to locations all along the path of totality, primarily within China, to take their chances in hopes of viewing the longest eclipse of the 21st century. Airfares to China were lower than in 2008, and security checks were not as rigorous as in 2008, both due to the fact that the 2008 eclipse occurred only a few days before the Olympics. There was yet another threat looming however, the H1N1 flu began a few months earlier, and the Chinese government imposed a check to stop potential individuals from bringing the virus into the country and infecting others. For some this meant waiting onboard the airplane for a temperature sweep, and for others it was a simple walk past an infrared camera. If someone were to be found with a temperature, that person and several others around them would be taken to quarantine, which could last 2 or 3 weeks, and could make eclipse chasers miss the eclipse entirely. To my knowledge, no eclipse chasers were detained from their agendas with such a problem.

The path of totality for TSE2009 is marked with 11 locations for which there is a corresponding report found herein
Map modified from online maps by Xavier Jubier and Google Maps

That was not the only problem as some locations in China, before, during, and after the eclipse were experiencing the monsoon. Several eclipse groups experienced poor weather, but some managed last minute transportation, and headed further inland, or simply looked for a break in the clouds. Most locations in China that were able to see the eclipse did so through the prevailing haze, making details in the corona difficult or even impossible to make out. Some people saw a foreshortened totality, and others saw only a few brief seconds, but some was better than none, and many saw only clouds and rain.

There were reports that some tour guides in China did not allow for changes to the schedule; this has been the norm in China in the past as tour guides need to follow strict regulations set by the government, especially when heading into carefully controlled regions (as was the case in western

China for TSE2008.) It was a mixed bag, so when clouds and rain blanketed Shanghai, some groups managed to do chase the eclipse, while others did or could not.

So now, without further fanfare, on to a few reports from across the zone of totality . . .

INDIA, TAREGNA

The Sun was to rise almost totally eclipsed on the coast of India near Mumbai, but the monsoon was not to allow viewing the event from the ground. *Cox and Kings India Ltd.*, together with the *Science Popularization Association of Communicators and Educators* (S.P.A.C.E.) and their astronomy group *Eclipse Chasers Athenaeum (ECa)*, set up a special charter flight aboard a JetLite 737-700 aircraft to fly at 41,000 feet above much of the clouds. The flight departed from Delhi with 74 passengers to encounter totality over the Ganges Valley near Taregna, India, where 21 Sun facing windows allowed premium seat holders an unobstructed view of totality.

Thousands of people assembled to view the eclipse from Taregna, scientists and individuals alike, but the only thing visible were clouds. Below are a few excerpts reported by CBS News (see http://www.cbsnews.com/stories/2009/07/21/tech/main5177630.shtml);

> *Television pictures showed thousands of people gathering in the northern city of Kurukshetra to take a dip in the river Ganges during the eclipse, where devout Hindus believe will cleanse them of their sins.*
>
> *Still, millions across India were shunning the eclipse and planned to stay indoors, gripped by fearful myths.*
>
> *Even in regions where the eclipse was not visible, pregnant women were advised to stay indoors in curtained rooms over a belief that the sun's invisible rays would harm the fetus and the baby would be born with disfigurations, birthmarks or a congenital defect.*
>
> *Krati Jain, a software professional in New Delhi, said she planned to take a day off from work Wednesday to avoid what she called "any ill effects of the eclipse on my baby."*
>
> *"My mother and aunts have called and told me stay in a darkened room with the curtains closed, lie in bed and chant prayers," said Jain, 24, who is expecting her first child.*
>
> *In the northern Indian state of Punjab, authorities ordered schools to begin an hour late to prevent children from venturing out and gazing at the sun.*

CHINA: XIANTAO

By: Zbigniew Zembaty & Lukasz Chudy
Observing Location: Proximity of Xiantao, China
Posted by Zbigniew ZEMBATY on SEML on July 23, 2009 At 08:34 AM PDT

When we woke up July 22nd at 6 a.m. in Wuhan we realized that the thin patch of white clouds almost completely covered the firmament, so we took a taxi and went westbound reaching [the] proximity of Xiantao (100 km west of Wuhan) soon before totality. Between the patches of clouds there were extended clear and blue areas. You can imagine how happy we were when we realized that 1 minute before totality one such blue area moved onto the Sun! We had just 15 minutes of clear sky around the Sun right when we needed it, and during the whole of totality we could observe the eclipse without any clouds.

Locals gather around the eclipse chasers near Xianto

CHONGQING

by Fred Espenak

Observing Location: Kingworld Hotel, Chongqing, China,
Tour Group: Spears Travel
Web Site: www.mreclipse.com

After a successful 2008 Eclipse trip to China, Gary Spears and I hoped to repeat our good fortune with our 2009 expedition.

Spears Travel Group **Photo © Fred Espenak**

Our group of 37 visited some of China's most renowned attractions during the week preceding the eclipse. The previously selected eclipse site was our hotel in Haiyan, a coastal city located about 100 km southwest of Shanghai. In the days preceding the eclipse, we enjoyed sunny skies much of the time. However, a daily check of the July 22 weather forecast grew more and more pessimistic. By the morning of July 21, all computer models for eclipse day predicted heavy overcast and thundershowers throughout the Shanghai-Hangzhou region.

The tour group was out sightseeing while Gary and I remained behind at the hotel to brainstorm a number of plans to transport our group to clear skies. Most locations offering better weather prospects were simply too far away to drive. With time running out I made the desperate suggestion to fly the group half way across China to Chongqing where the forecast was more promising. As unbelievable as it seems, our Chinese tour guides Xuebao Lin and Lydia Yang were able to find a flight from Hangzhou to Chongqing with seats for the entire group as well as a hotel and bus transportation while in Chongqing. They also reserved seats for us on a return flight to Shanghai on the evening of July 22. This new itinerary would only cost about $350 per person. Amazing!

At 11 am we briefed the group on the weather situation and our new plan. The case we made must have been compelling because it was quickly and unanimously decided to hop a plane to Chongqing rather than travel to our original destination in Haiyan.

For the next two hours the hotel lobby was transformed into an obstacle course of open luggage as we repacked for the one-day trip to Chongqing while leaving most baggage behind to be retrieved after the eclipse.

The 5pm flight from Hangzhou to Chongqing was delayed several hours as we nervously awaited our departure. After a three-hour flight, we retrieved our luggage, boarded the waiting bus and arrived at our new hotel by 11 pm. With just 10 hours before totality, I surveyed the hotel parking lot for a suitable area to cordon off for an observing site. Tall buildings surrounded the parking lot but the view to the east was unobstructed. This was just what we needed since the eclipse would occur early the next morning in the eastern sky.

It was now midnight and I needed to catch a few hours sleep. In spite of pre-eclipse jitters, I dozed off. At 4am, my alarm watch propelled me into consciousness and the task of assembling my equipment.

Fred Espenak and his Eclipse Gear
Photo © Patricia Espenak

From the urban location of our hotel, I could only spot 1st magnitude stars, but it was enough to know the sky was free from clouds.

My equipment included two equatorial tripods and electric drives supporting three telescopes. After a quick breakfast I transported all the equipment to the parking lot observing site.

During the night Xuebao and the hotel staff had covered artificial lighting in the parking lot with black plastic to prevent lights from potentially interfering with eclipse observations. There were chairs and a table of drinks. My wife Pat posted a sign listing the eclipse contact times I had calculated the night before using the GPS coordinates of the parking lot.

I was far from ready as I performed a crude polar alignment of my equatorial tripods using a compass and a bubble level angle finder to set the latitude. Working as quickly as possible, I set up my 90 mm refractor in time to catch 1st contact at 8:08am. The sky was filled with high cirrus clouds that required a 3-stop compensation for exposures of the Sun's disk. I was using Fred Bruenjes' Eclipse Orchestrator program to control two of my Nikon DSLR cameras.

The hazy conditions meant that I had to modify all the exposures in the photography script before I could launch the Orchestrator program. This was difficult to do in bright sunlight because the PC screen was hard to see. I persevered while continuing to shoot partial eclipse sequences manually.

About halfway through the partial phases the new photo script was ready. I connected the control cables from a tiny Asus PC to two Nikon cameras, fired up Eclipse Orchestrator and was rewarded with the sound of the computer program firing the shutter of my Nikon D300.

I now had time to finish setting up two video cameras. Several more cameras remained in the case since no time was left. My attention was now directed to ensuring that my two still and two video cameras were operating optimally and that equatorial mounts were tracking the Sun.

About 15 minutes before 2nd contact (start of totality), I noted a 22-degree halo centered on the crescent Sun. The ice crystals present in the high altitude cirrus clouds produced the atmospheric effect and reminded us that clouds still threatened our view of totality.

Fortunately, the sky conditions continued to offer a good view of the partial phases. In the final 60 seconds before totality, I pulled the solar filters off my telescopes and video cameras. Reassured by the sound cameras firing automatically via computer control, I watched the sky by naked eye as the shadow approached. It was only now that I realized our group was surrounded by curious locals who found us as interesting as the celestial event above. Some 10 seconds before contact I could make out the corona during the diamond ring effect.

Totality! We were in the Moon's umbral shadow (09:13am). I was now experiencing my 22nd total eclipse. But unlike most of the other eclipses I've witnessed, I actually had time to watch this one. Instead of being completely preoccupied with the manual operation of camera sequences, the Eclipse Orchestrator software freed me to enjoy much of the visual spectacle.

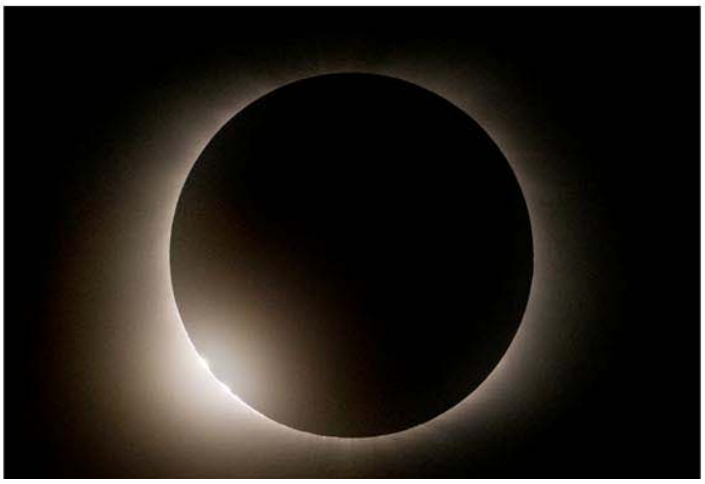
Of course, I had programmed several pauses in the computer program script so that I could check the telescope tracking and re-center if necessary. I also adjusted the exposure of video being shot with my Nikon D90. The rest of the time I was able to take in and enjoy the incredible sight.

Venus was nearly overhead but a thick band of cirrus blocked Mercury from view. The cirrus also interfered with both viewing and photography of the outer corona. The high altitude cloud layer acted as a diffuser to imaging especially at the longer exposures. Nevertheless, the inner corona was seen in great detail. Polar brushes were evident and a splendid arc prominence became visible along the 3rd contact limb as totality drew to a close.

When Baily's Beads appeared in my telescope, the crowd around us roared in applause. A naked eye view revealed the growing diamond ring as the corona quickly faded in the glare. Totality was over as daylight returned.

We took time now to congratulate each other on the brilliant strategic move of flying 1300 km to Chongqing. In hindsight the plan seems so obvious, but I must admit that I had serious doubts about the gambit conceived just 24 hours earlier. I am by no means a meteorologist. I hoped that the information gleaned from computer models on several web sites was not only correct but that my interpretation was leading to a successful eclipse plan. Or maybe we were just lucky. In any case, it rained at our original Haiyan hotel during totality.

I was one of the last people in the group still taking photographs at 4th contact (10:31am). After a marathon job of repacking my equipment, we took a bus tour of Chongqing, ate lunch, and returned for the airport for our evening flight. All 37 of us wore big smiles all the way back to Shanghai.



WUHAN

Glenn Schneider

Observing Location: Wuhan Bioengineering Institute, Wuhan, China, N 30º42' 54.1' E 114º 31' 12.1"'
Tour Group: Rick Brown's Eclipse Safaris
Web Site: http://nicmosis.as.arizona.edu:8000/UMBRAPHILLIA.html

From this location we had anticipated, and planned for, 5m 29.6 of totality predicated upon the predicted local eclipse circumstances. But, we saw "only" approximately 94 seconds. I say "only", in quotes, because this alone was still very significantly longer than five of the (27) earlier times I have been enveloped by the lunar umbra: (1977 [38s], 1986 [0 to 5 seconds depending upon how defined and measured], 1995 [57s], 2002 [26s], and 2005 [32s]). Indeed, it is a sobering thought that the amount of totality we saw of TSE2009 was essentially equal to that experienced in total

from 4 of those 5 aforementioned eclipses! The disparity between the ~ 5m 30s of totality predicted and the ~ 94 s we saw, however, was not because our eclipse predictions were off the mark (they were not!). From our site at the WBI, happily, some coronal photons did make it through the shifting clouds, contiguously for the last minute and a half plus of totality (see below), thus enabling a partial victory snatched from the jaws of a cloudy defeat. "Last minute" dashes to out run fronts or find holes in cloud cover (as I have before done when meaningfully informed, e.g., TSE1976, TSE1979 and TSE1997) did not apply. Over the entire Wuhan region for short time-scale relocatability, the local cloud conditions after sunrise were spatially variable and quite broken on small scales as noted in situ and with satellite imagery.

Glenn's entire report is available at; http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_09/TSE2009_REPORT.html

The images above were taken by Glenn Schneider during the 94 second break in overcast skies at the end of totality

TIANHUANPING

by Jay Pasachoff
Williams College

Observing Location: Tianhaunping Mountain
Tour Group: A Classic Tour
Web Site: http://www.williams.edu/astronomy/eclipse/eclipse2009/2009total/index.html

Montage courtesy Rachel Wagner-Kaiser and Sara Dwyer, Williams College Eclipse Expedition [2009]

We observed the eclipse from Tianhuangping, a 900-meter-high mountaintop an hour west of Hangzhou, a garden city that is about 3 hours west of Shanghai. I had chosen the site about two years earlier, on a reconnoitering trip with astronomers from the Chinese National Astronomical Observatory and the Beijing Planetarium. We were greatly assisted by Lin Lan, the astronomy teacher at Hangzhou High School. At the site, we wound up by eclipse day with (a) my prime group of about 20 researchers, colleagues, students, and spouses from Williams College and related institutions; (b) an additional 40 friends and colleagues; and (c) a tour group of about 20 people from A Classic Tour. The tour head for the last group was Mark Sood, with whom I have run eclipse tours since 1980. The site was a luxury hotel next to a pumped-storage reservoir. Also at the site, following information distributed in my role as Chair of the Working Group on Eclipses of the International Astronomical Union, were scientists from about a dozen different nations.

Photo of the hotel terrace courtesy Kyle Adler ©

My scientific and student group arrived in Hangzhou about 10 days in advance. We had reserved the main terrace of the hotel for our group, which included not only our scientists and students but also a collaborating group from Greece, and colleagues and photographers from elsewhere (California (Pasadena), Washington (Seattle), New York (Brooklyn), Australia, England, Greece), as well as

some students from Hangzhou High School. The weather was excellent when we first arrived on the mountain, and we were able to set up and align our telescopes without problem.

The day before the eclipse, we were joined by the tour group from A Classic Tour (www.aclassictour.com). They had arranged a site on a hill opposite the hotel, from which they could look down on us while being favored for looking up at the eclipse.

The weather on the morning of the eclipse was worse than we had had on any prior day. Fortunately, the clouds thinned prior to totality, and we had a relative hole in the clouds during totality itself. A movie posted on the Website shows the clouds moving across the Sun even through totality. Still, given the heavy clouds earlier in the morning (and, indeed, later in the day), we all considered ourselves lucky to have been able to see all the dramatic eclipse phenomena: Baily's beads, diamond rings, and corona.

Our scientific work was sponsored by a grant from the Committee on Research Exploration of the National Geographic Society. We were also accompanied by a team that is making a movie about the sun and the eclipse to be shown on National Geographic Television.

Photograph courtesy Jay Pasachoff, Sara Dwyer, and Rachel Wagner-Kaiser, Williams College Eclipse Expedition [2009]
Imaged with a Nikon D300 with a 600 mm f/4 Nikon telephoto lens with a 2x Nikon doubler.

After the eclipse, the tour group moved on to western China, including distant Xinxiang cities of Kashgar and Urumqi. After a scientific eclipse meeting in Suzhou, my wife and I joined the group in Urumqi. A highpoint was the visit to the 6th-century Buddhist caves at Dunhuang. The ancient city of Turpan was also a major delight.

After our western-China stay, we went via Xian (where we visited the terra cotta warriors) and Chengdu (where we volunteered in the panda sanctuary, helping clean out their cages) to Lhasa. In Tibet, the visit to the Potala palace was a lifetime high point.

I was blogging about the eclipse for The New York Times. Please check out the trip timeline at
http://www.williams.edu/astronomy/eclipse/eclipse2009

JINSHAWEI

"UNFUNNY JOKES OF THE GODS"

by Juan José Manzano

Translation by: María José Hernandez and Itahisa González
Observing Location: Jinshawei, China, N 30º42.123' E 121º20.082'
Members of GOAT - Grupo de Observadores Astronómicos de Tenerife, [Canary Islands, Spain]
Web Site: http://www.astrosurf.com/goat/

"The Crew" **Photo © José Ángel Estévez and used by permission**

Sometimes plans do not turn out as well as we had imagined them to turn out. There is no adventure without the uncertainty of the final results and that emotion is what makes it interesting to undertake an activity so much looked forward to during preparations.

Reaching a mountain's summit after a short walk can be enormously rewarding, but it is more rewarding if it requires overcoming difficulties and a personal effort that gives that climb an added value. But, sometimes, we would prefer not having that emotion as long as we can reach the proposed aim.

In our case, preparations had taken us almost a year of trials, meetings, and savings. As the departure approached, email messages increased exponentially and when we got on the plane, we began to close doors behind us to open new ones before us in a path prearranged months ago.

That path took us to Shanghai, one of the most spectacular cities I have had the opportunity to visit, with so brutal contrasts of habits, weather, architecture, traffic... but our minds were set on the longest eclipse of the century, the longest I could ever see in my entire life, whose band of totality was going to cross that city, and whose center line was going to be only 80 kilometers south of Shanghai.

The day before the eclipse, we held a general rehearsal of events for which we would have a repeat performance for the next day. We timed the duration needed to arrive at the observation site at Jinshawei, the

setting up of equipment... all possible variables were taken into account and even a “plan B” was considered just in case the weather conditions were bad. But “we did not come there to fight against the elements” and when, on the afternoon, of our rehearsal and the meteorological predictions were confirmed, we found ourselves confronting the worst possible perspective: having the certainty of not being able to see anything because of the clouds and storms that were predicted in all the area in which we could have attempted a plan “C”.

It seemed as if the gods we had entrusted our hopes to were mocking us. I will never forget that weather chart with the area completely covered by clouds and storms. The sorrow caused by that vision gave way to the certainty that we will be below the shade of the Moon but we would not be able to enjoy the wonderful show of “the Black Sun”, the crown, the diamond ring, the Baily's beads, the chromosphere, the shadow bands and that indescribable feeling of being witnesses of something unique, a very personal experience.

With that certainty of the inevitable we proceeded, according to our original plan, to our designated place of observation, where, curiously but not so surprisingly, equally desolated Italian, French, British and, of course Spanish groups gathered together. Half-heartedly we set up the instruments, adjusted parameters and waited for the moment of the first contact. Suddenly a shy Sun let himself be seen during some seconds from behind the clouds that acted as a natural filter. A general stir was felt and the hope to be able to see something started to fight against the fact of a completely cloud covered sky.

First contact! The Moon began to “eat” the Sun and we despaired, full of powerlessness. Evil gods seemed to be conjured and they did not give us any reliable margin, but for an instant, the Sun was seen again for a few seconds showing a small mouthful in his brilliant disc. Another general stir and the cameras started to shoot. The time for the second contact was near, the beginning of totality, and it seemed that divinities played with us allowing scant appearances of the King Star to make us think in a possible miracle “in extremis”. Three minutes for the second contact and, although the Gods of Rain and Wind decided to leave us untroubled, the one of Clouds decided that we had already enjoyed enough and sent the darkest cloud to sink us in total misery. In those conditions the shade of the Moon came over us, the gray day became gray night and, resigned, we lived the moment the best we could. “To the bad weather, good face” prays the Spanish saying, and that was the philosophy we were forced to follow at that time.

However Gods had not finished their plays. During the full totality, for three seconds, the crown and the Moon eclipsing the Sun were visible. Only three seconds of “totality” were not long enough to take pictures but it was long enough to be recorded in our retinas forever. And thus we arrived to the third contact, with the return to the “normal” day, with light appearing suddenly and putting an end to our mortal illusions. But if it was possible any doubt about the divine wrath against us, the natural elements did not even allow us to finish the vision of the eclipse: a sudden heavy rain left us and our equipment completely soaked before we were able to pick it up.

There will be unforgettable eclipses, all of them are unique experiences, but I will never forget the longest of the century, Shanghai 2009, the one whose totality I saw for only three seconds.

Last picture before C2 (2nd contact) **Both Photos © Juan José Manzano, Canon 400D, SW Mak 90/1250, Eq3** First picture after C3 (3rd contact)

NING BO

Charlie

Observing Location: Ning Bo, China,
Tour Group: RASC, Calgary Centre

Posted by Charlie on SEML* on August 3, 2009 at 08:33 AM PDT
Our group was also in the Shanghai area and we also moved to seek clearer skies. In fact, we had just stopped for a break at the same rest stop when the Sky & Tel buses pulled in. Our plan was to move closer to the coast so we headed out towards Ning Bo. The clouds thinned about halfway there and we saw our first glimpse of the Sun (raising our hopes immensely) but it soon vanished as the clouds thickened around the coastal hills. In Ning Bo, the clouds were thin enough to see the sun and looked to be thinning. We set up in one corner of a shopping plaza parking lot and waited for first contact, which we saw right on schedule. The partial phases were visible through the thin cloud but the amount of cloud made photography difficult. Second contact brought us lots of Bailey's Beads and a beautiful long lasting diamond ring. A single prominence was visible once the sun was totally eclipsed. The inner corona, out to about 1 solar diameter, was delicately detailed including polar brushes. The approaching shadow had been visible between the plaza and an adjacent building and the edge of the shadow after 2nd contact was well delineated in the sky. Dark side lunar features were a little hazy, but the Moon itself looked significantly bigger than normal. Venus was easily visible as was Mercury, although the latter came and went with the clouds. 3rd contact came way too soon and we saw a repeat of the beads, although the diamond ring didn't seem to last as long. The following partial phases played tag with the clouds, but we weren't paying much attention at this point - we were thrilled that we were able to see an eclipse that we thought would succumb to the weather. Kudos to our team leaders Don & Glen from Calgary Centre RASC for, once again, guiding us to a successful eclipse. For us, in Ning Bo, totality was 4 min 30 sec, shorter than what we'd hoped for, but far better than the 0 minutes we would have seen had we not moved.

TOTALITY FROM THE PACIFIC

To my knowledge there were 5 cruise ships in the Pacific Ocean which positioned themselves along the path of totality in hopes of having good viewing for the total eclipse. Costa Allegra, Costa Classica, Fuji Maru, Asuka II and the Paul Gauguin.

COSTA ALLEGRA and the ROKOYO ISLANDS OF JAPAN

The Costa Allegra, a sister ship of the Costa Classica, booked passage on a shorter and less expensive cruise that positioned itself on the centerline in the islands off southern Japan. It departed from and returned to Shanghai, and visited the same ports as did the Costa Classica. It would have a longer duration of totality than any of the times in China, and even more than the Rokoyo Islands of Japan since it could position itself directly on the centerline. Unfortunately the weather south of Japan was cloudy and rainy on eclipse day, so none of the people in this region were able to see totality.

Three ships were positioned near the point of maximum eclipse or in the case of the Costa Classica, the point of maximum duration, for the longest eclipse of the century.

FUJI MARU

ASUKA II

Three cruise ships converged on one region of the Pacific Ocean, in hopes of viewing the most spectacular natural site in the world. From Japan, were the Fuji Maru and the Asuka II. All three ships aligned in the darkness of totality within a few kilometers of each other on July 22 of 2009. The view from these ships was likely very similar to that from the Costa Classica. I have found two videos on YouTube from the Asuka II. One which shows that the number of people on the deck has wide spacing between the observers, therefore implying the number of passengers was markedly less than that on the Classica, and for those on the Classica, 2 photos of the Classica are seen between 4:25 and 4:33.

You can view this photo montage at http://www.youtube.com/watch?v=inmP3Pkgmw0

The 2nd video from NHK TV from Japan, shows the entire totality, indicating 6m 33s of totality as they encountered some thin and fast moving clouds; http://www.youtube.com/watch?v=kYhFdKzq6rM

COSTA CLASSICA, TOTALITY AT MAXIMUM DURATION

by Larry Stevens

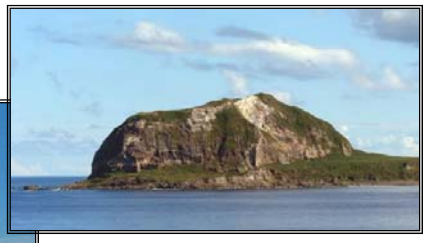
Observing Location: Costa Classica Cruise Ship, Pacific Ocean, N 25º 15' 46" E 142º 02' 37"
Duration of Totality: 6m 39s

Whenever I am on a solar eclipse trip, I always have a rule of thumb; *let the bad weather come early on in the trip, and let it get it out of its system, as long as it is good on eclipse day*. For TSE2008, the only time I found "blue" skies was from western China, and fortunately at the eclipse site, otherwise there was a perpetual haze, and not wanting to take a chance on weather conditions and desiring to get the maximum duration from the longest TSE of the 21st Century, my choice was a simple one. This would be my first cruise to see a total solar eclipse. Due to the bulk of my normal eclipse camera lens, a C-90, a small equatorial mount and tripod, I decided to leave it behind and instead use the 300 mm zoom that came with my Nikon D300 kit, and a new carbon-fiber camera tripod.

We set sail in light rain, and it continued for much of the trip, and we also started out with moderately rough seas. We had two stops on the way out for a few hours in Cheju, a South Korean island, and was followed by a stop in Kagoshima, Japan. There a small group of us organized by Harold Katzman, hopped in taxis, jumped on a ferry, and did a short walking tour of the volcano, which last erupted in March of the same year. On the way back I stopped in the volcano's visitor center, where a sign read that it had erupted some 235 times this year, which would have been more than once a day to this point. I took it to really

mean that there had been that many earthquakes on the volcano for the year, and likely relatively minor ones.

Iwo Jima (renamed to its original Iōtō in 2007) seen from the Costa Classica



Mt. Suribachi at the southwest corner of Iwo Jima

Crescents from a strainer -- >

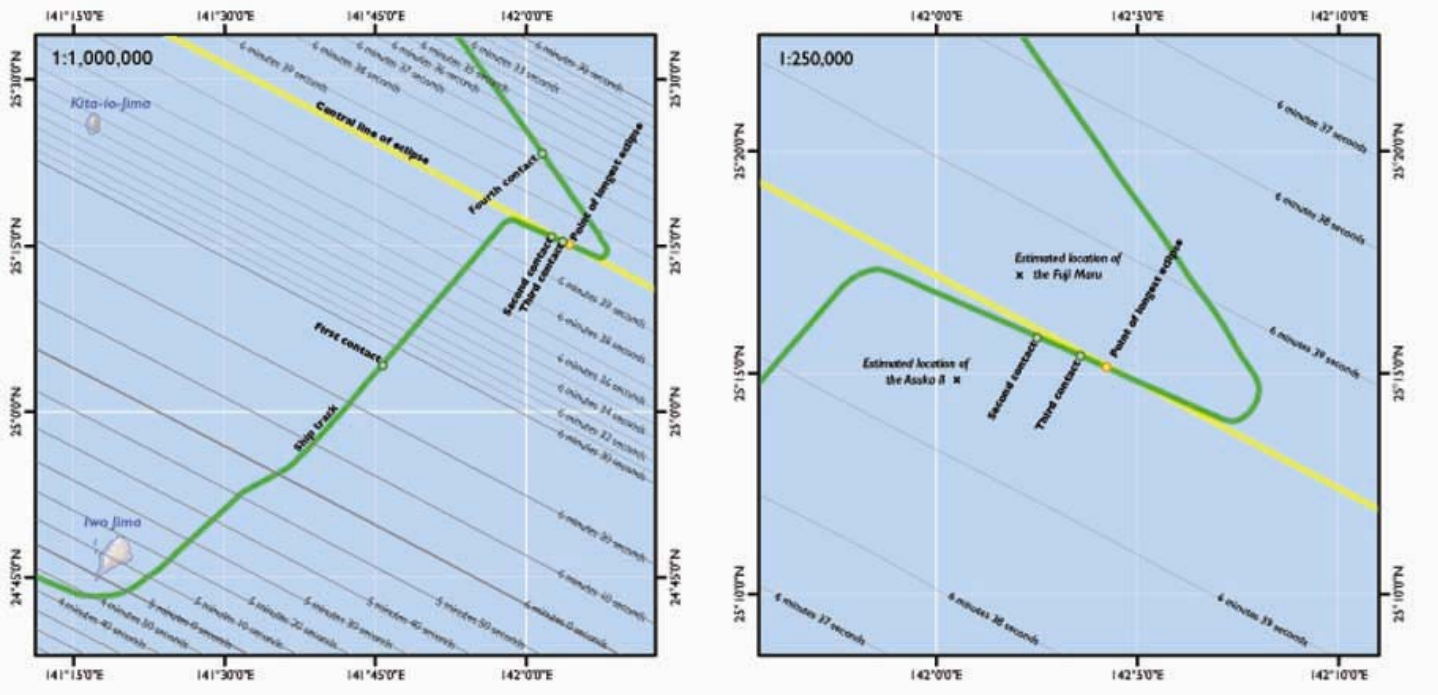
The morning of eclipse day had a large number of cumulous clouds. As the ship steamed further east, the space between clouds became larger, even as we circled around Iwo Jima several large clouds were still quite evident as they still covered some 50% of the sky and the partial phases began as we headed to our encounter with totality. But as we headed north for the centerline, and the Sun plunged deeper into eclipse, the clouds above us began to dwindle more and more. As we turned southeast to matched the imaginary path of the centerline, there were absolutely no clouds to be found except for the distant horizon, where it was ringed completely by the cumulo-stratus, which served as quite a site as the shadow approached and plunged the northwest clouds into shadow, and the southeast into an orange glow. For me at least things were a bit hectic.

One day before the eclipse was when we had a chance to set up our equipment and do a dry run. The ship oriented itself like it would be positioned on e-day, and I adjusted my equipment as such. I left my tripod on deck so it would be correctly positioned for the next day. Instead of viewing the eclipse first however, after first contact the ship headed for Iwo Jima for a close pass. This was a poor choice for two reasons. First it made the setup done the day before worthless if you intended to shoot partials, and I had to change everything to image the Sun as the ship headed SE, then NNE, and then settling back on the eclipse path headed ESE shortly before totality. This did not leave enough time to refine the tripod settings before totality, and mostly threw off my camcorder positioning, which I had originally set so I could simply pan in one direction to keep up with the diurnal motion, so I was fiddling with that half way

through totality trying to get it set correctly and in alignment with the still camera. And second, my good camera was tied up for eclipse photos when we passed Iwo Jima, and I was not willing to compromise the positioning on the tripod, which in the long run, did not make much difference.

Eclipse Circumstances for July 22, 2009

The point of longest eclipse and the path of the Costa Classica and its positions during Totality and the estimated positions of the Fuji Maru and Asuka II



Positions

Point of Longest Eclipse	25° 15′ 6.6″ N,	142° 04′ 14.1″ E
Costa Classica at 2nd Contact	25° 15′ 48″ N,	142° 02′ 31″ E
Costa Classica at 3rd Contact	25° 15′ 23″ N,	142° 03′ 35″ E

Eclipse duration at all three points was 6m 39.4s

The velocity of the umbra was 2335 kilometers and the width was 258 kilometers

The length of the ships track from C2 to C3 was 1/97 km, the ships speed was 17.7 km/hour. The forward motion of the ship added approximately 3 seconds to the duration of totality. The ship passed through the point of longest duration about 3 minutes after totality

Lunar limb corrections at the beginning and ending of totality were precalculated as 0.2 seconds for C2 and -3.6 seconds for C3. This reduces the calculated duration back to 6m 39s. Duration of totality as recorded with video recordings averages 6 minutes and 40 seconds.

Predicted timings (factoring ships forward motion)

2nd Contact	2:25:46 UTC	11:25:45 Japan Time
Mid-eclipse	2:29:07	11:29:07
3rd Contact	2:32:29	11:32:29

Map created by Michael Zeiler (Michael.zeiler@yahoo.com)

Lines of constant eclipse duration derived from terrain dataset generated from gridded datapoints calculated by Bill Kramer (www.eclipse-chasers.com)

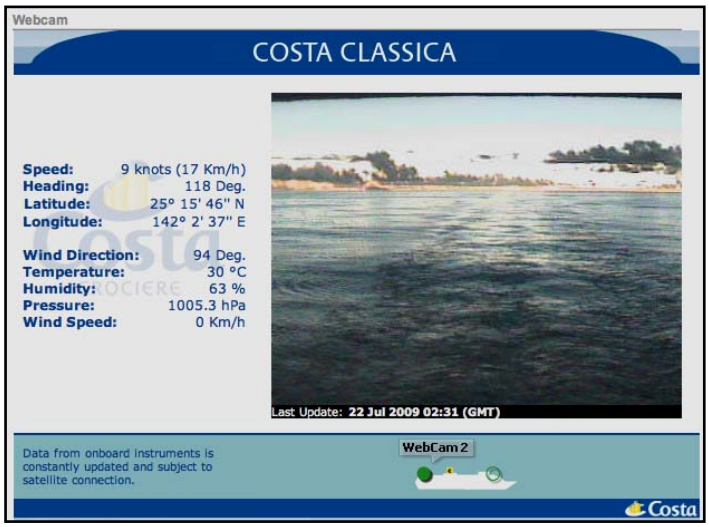
Point of longest eclipse calculated by Glenn Schneider
Predicted timings given by Roy Mayhugh (www.astronomyvacations.com)
Ship track integrated from GPS positions collected by Dave & Ray, Tom Marsella and Mark Friedman
Positions for second and third contact locations collected by Adrian Hlynka and Stephen Bedingfield
Eclipse predictions by Fred Espenak, NASA Goddard Space Flight Center (www.mreclipse.com)

Because of all of the difficulties I was having in these regards, after I changed out of first contact mode and set the camera to do a series of bracketing, I attempted to manually refocus, which just made things worse. Would the camera have been able to keep a good focus with auto-focus turned on? Maybe. So all photos with my primary camera of the eclipsed Sun turned out blurred.

As for the duration, when Roy came on the loudspeaker to announce mid-eclipse, many gasped that so much time had already lapsed, however after several shorter eclipses, I initially though he was going to announce that 3rd contact was only seconds away, when in fact just half the eclipse was over, which at mid –eclipse was longer than the last eclipse I had attended.

There was little in regard to prominences, the most disappointing show I believe I have had in 9 totals and even including one annular (ASE1984) eclipse which displayed prominences, I have ever seen. Also, Baily's

beads were very few and brief. As far as rating eclipses, I would give it a 1 out of 10. I can only hope that solar activity will start to improve, and that TSE2010 near Tahiti will give me a much better show.



Captured by my friend Jim Leasure back at home while I as on board watching the eclipse, webcams showed both aft and fore showing the horizon during totality aboard the Costa Classica, while everything overhead was quite clear

Because the Costa Classica paralleled the centerline, and steaming along with the movement of the Moon, an additional 3 seconds of totality was added to the duration of maximum eclipse.

We returned to Japan to spend an evening at port in Kobe. I was on one of the excursions for an all day and night outing, where we ended up having a traditional Japanese 10 course meal, only half of which I could eat, mostly due to the amount of food, not the content. We had a geisha serve us drinks and then do a traditional dance, with the elder geisha [mother] playing a shamisen, the traditional 3 stringed instrument of Japan. Nearly 150 people opted to leave the ship in Kobe and return home, or onto other interesting adventures.

We would spend a couple more days on the ship as we returned to Tiajian, port city to Beijing, before our trip came to an end just a bit shy of 2 weeks on the ship. Internet onboard the ship was painfully slow, so there were only a few inklings of what weather was like for other eclipse chasers, especially those near Shanghai, who did not have good weather conditions. We had also heard the same fate for our sister ship, the Costa Allegra. There were some 900 eclipse chasers on the Costa Classica, significantly less than the 1600 initially expected, due to the downturn in the economy. Including the crew, about 1400 watched the eclipse. With all 3 ships counted in, likely in the vicinity of a total of 4000 individuals were able to view this eclipse at maximum duration. Because of the lengthy duration of totality, and the movement of the ship

which roughly paralled the centerline, we were able to add an additional 3 seconds to the duration, and passengers were able to view 6m 39.4s of totality.

The trip of Costa Classica to view TSE2009 Map created by Michael Zeiler (Michael.zeiler@yahoo.com)

Iōtō (IWO JIMA)

A few tour groups were hoping to view the eclipse from Iwo Jima, and few people are ever allowed onto the island, which is a memorial to WWII. In the end, only a select few scientists and a reporter and camera man from NHK TV had a satellite uplink for a live broadcast of totality beamed back to Japan. From the video, it would appear that the cameraman did not know what to expect at the beginning of totality the exposures start out much too bright, and too much camera jiggle. It does however show very small details in the equally small prominences that were visible and a few light clouds that occasionally and swiftly moved across the Suns disk. 5m 09s of totality was recorded from here. You can find this video on YouTube at;
http://www.youtube.com/watch?v=-stDw1N36O8

MARSHALL ISLANDS, ENEWETAK ATOLL

In searching for TSE2009 reports on the web, perhaps the most captivating were the reports and photographs that came from 3 different sources from a remote location in the Central Pacific, called Enewetak Atoll in the Marshall Islands. I say remote because it is on Enewatak and neighboring Bikini Atoll where the U.S. did testing of the H-bombs, where they were tested repeatedly.

There were a few small groups on Enewetak for the eclipse and a few individuals that chose this location for their observations. This was not your average eclipse trip, rather it was an eclipse adventure. I came across two marvelous blogs and much of their excerpts are found here, one from David Harrington, and another by Brad Templeton. This was also the location that Miloslav Druckmüller chose to make his exposures for a series of photographs of the Sun's corona in unprecedented detail. I could not choose between them as to which I liked better, as they both told a more complete account of the eclipse from a unique local, and partially due to this I look forward to my trip to Tatakato Atoll for TSE2010.

An Eclipse Adventure Timeline

by David Harrington

Institute for Astronomy, University of Hawaii

7-15 Wednesday - Honolulu & 7-16 Thursday in Majuro - Flying to the Marshall Islands

We left for the airport around 4:30am and landed in Majuro around 10am but didn't get in to the hotel until more like noon. Since we crossed the date line, it was noon on the 16th in Majuro. The team got an update about the airplane mid-day. We didn't yet know whether we'd actually have a working engine on "Amy" yet. And we were told that we were way over the weight limit. I took a walk with Huw around the back side of town (the island is thick enough downtown to support another road) and got my 'sense' of the place.

7-17 Friday - Beach and Sailing trip

We got word that the plane was on for tomorrow morning so we didn't really have anything to do today except discuss plans and sequences. It made no sense to unpack anything so we spent the morning working around the resort and then took a boat in the afternoon over to two nearby islands. The best swimming was on the first island of Enemanit. It was basically a privately owned place with some awesome hangout spots. The coral was fantastic as was the raft with the slide and diving board.

7-18 Saturday - Flying from Majuro through Kwajalein to Enewetak

We got up at 4:30am to get to the airport. Our flight left around 7am for 1 hour to Kwajalein to catch more fuel. After a half-hour 'detention' on the military base we flew another 1.5 hours to Enewetak and landed around noon. We had quite a greeting and then took 'the bus' to the eastern most point of the island and set up camp at the 'dorms', 'radiation lab' and a few of us set up tents on the beach at the point. We set up tents and layed out the gear for the eclipse.

7-19 Sunday - Enewetak, Preparing

We spent all day outside setting up mounts hardware and other things. I spent a few hours at night doing some astrophotography.

7-20 Monday - Enewetak, Preparing

I was mostly useless at this point since Sarah had our experiment ready while the main UH tent was quite frantic. I spent the day inside making plots as it was over 100 and humid. I dried my clothes in a 'real' drier before going to bed out in my tent. I woke up dripping.... hot and humid always....

7-21 Tuesday - Enewetak, Preparing

This day mirrored yesterday. The main tent was still frantic and I was still mostly useless. This was another day spent making plots. The sunset was great.

7-22 Wednesday - Enewetak, Eclipse

The day was frantic with preparation. Sarah and I did practice runs in the morning and were ready a few hours early. The eclipse was a fantastic display of nature and I had 3 full minutes to just sit and watch. Fantastic! I set up my own cameras which in the end proved mostly useless. I had the exposure times way wrong and should have zoomed in more. And I didn't have tracking mounts, only tripods, which would have killed any zoom shots. Lesson learned. However, after the eclipse we started tearing down the setups and I borrowed a mount for a few nights. This hooked me on real astrophotography. Our European companions had fantastic gear and I learned a lot about this subject from Milosh, Peter and Martin. I think I may have to borrow these mounts for Haleakala in the near future.

7-23 Thursday - Enewetak, Packing

We spent the day packing up and cleaning equipment, processing pictures and finished with some more astrophotophotography in the evening. I tried out the IR Canon.

7-24 Friday - Enewetak, on a boat

We had chartered a boat ride to the concrete dome where they buried all the radioactive waste. We brought geiger counters and actually detected near-background levels. It was pretty odd considering where we were. Yes the counters worked, we calibrated them at the radiation lab using the stock samples. We got millions of counts from the samples, something like normal counts from Enewetak and nearly

nothing out at the dome. I think you get more radiation flying in a jet at high altitude then you do down here. After the boat ride, we went for a snorkel on the ocean side. Fantastic water.

7-25 Saturday - Flying Enewetak through Kwajalein to Majuro

The morning was spent packing and we left Enewetak on Amy around noon. We made it to the resort near sunset, had dinner and passed out.

7-26 Sunday - Sailing back to Enemenit

As a big group (save the Welshman) we took a boat back to Enemenit and spent the day hanging around. There were cirrus blocking the sun so it was actually quite pleasant. Cool water and not to hot. The family that owned the place was out so we got some good local stories. It brought me back to my summers growing up on the lake....

7-27 Monday - Flying Majuro to Honolulu

I'm spending the day in the resort restaurant catching up and posting all this stuff.....

Many more photos from this trip by David Harrington can be found at;
http://www.ifa.hawaii.edu/~dmh/WEBSITE-Pictures/2009-07-15-Marshall-Islands-Eclipse-HTML/index.html

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University of Hawaii Institute for Astronomy Expedition 2009

The IfA Solar Wind Sherpas Team. From left to right, standing: Judd Johnson (Electricon), Shadia Rifai Habbal (IfA), Adalbert Ding (Technische University, Berlin), Martina Arndt (Bridgewater State College), Mindy Lekberg (Chelmsford High School), Joannie (Wellness Center in Majuro, RMI). From left to right, sitting: Huw Morgan (IfA), Emily Mount (Appalachian State University), Isabelle Scholl (IfA), Beverly Lynn-Wilson (Friend of the IfA), Dave Harrington (IfA), Sarah Jaeggli (IfA).

Shadia Rifai Habbal (IfA) ready for the eclipse

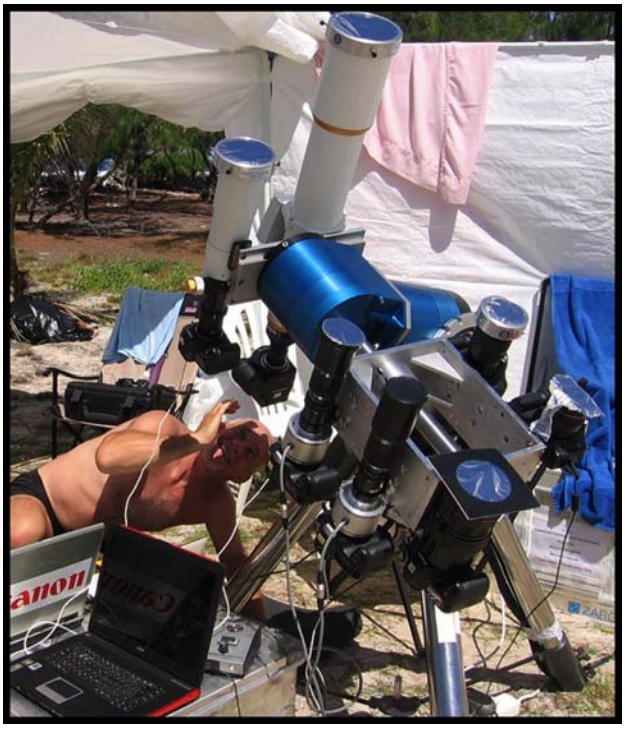
Shadow-tracking Expedition 2009

Miloslav Druckmüller

Observing Location: Enewetak Atoll, Marshall Islands –
N 11º 21.546' E 162º 20.827' Alt. 3m
Members of the International Expedition
Web Site: http://www.zam.fme.vutbr.cz/~druck/eclipse/

I observed the total solar eclipse of July 22, 2009, on Enewatak Atoll in Marshall Islands as a member of the international expedition perfectly organized by Shadia Habbal, the Chair of Institute for Astronomy, University of Hawaii. The expedition consisted of two relatively independent parts, called for simplicity American and European. However the scientific program of both parts was coordinated.

The expedition to Enewetak was a part of the Shadow-tracking Expedition Project, which is being organized by me and my daughter Hana at Faculty of Mechanical Engineering, Brno University of Technology, Czech Republic. The goal of the "Shadow-tracking expedition" project is to obtain observing data from various places during the total solar eclipse, which enables us to study changes in the solar corona. The second observing place was in Suzhou in China. The observing conditions on our observing place at Enewetak enabled us to realize majority of our plans. Unfortunately, in Suzhou it was raining during the eclipse.



Above: Peter Aniol checks the alignment of his massive precision tracking mount minutes prior to 2nd contact. 7 instruments and cameras are attached to the platform.

* * * * * * *

Right: The Shadow-tracking team (from left to right) Vojtech Rušin (Slovakia), Martin Dietzel (Germany), Cornelia Firsching (Germany), kneeling: Peter Aniol (Germany), Miloslav Druckmüller (Czech Republic), Ľubomír Klocok (Slovakia), Karel Martišek (Czech Republic).

Imaged with a 500mm f/6.3 and a Canon EOS 5D, 38 images were selected , 300 dark frames and 100 flat fields went into the production of this image, and of course Miloslav's unique software utilities further enhances the coronal details

* * * *

Miloslav Druckmüller and Hana Druckmüllerova are the founders and coordinators of the MMV project, the Mathematical Methods of Visualization of the Solar Corona. By looking at the detailed image above you can see how making images at one location can result in a highly detailed image of the corona, with unparalleled detail. The study is best accomplished by having several imagining locations along the path of totality.

Miloslav would appreciate others seriously willing to help out with the study, but he wants contributors to know that they cannot incorporate images taken through light clouds. They had 4 locations in China set up for TSE2009, but none of the images they captured there were useable. Even on Enewetak, of the 80 images shot, but only 38 were used in the final composite because light clouds were passing across the disk of the Sun, fortunately fairly quickly.

Some of the requirements are to use RAW mode, with a high resolution DSLR camera, shoot at 100 ISO using a paralactic mount or 200 ISO using a fixed mount, from 200mm to 1600mm lens, a range of exposures, Bias images (camera set to the shortest exposure time and lens cap on), Dark Frame images (for each exposure in excess of 1/30s there need to be at least 4 images) of equal exposure duration, Flat Field images (image the sky using a diffuser set to auto-exposure mode set to aperture priority and exposure correction to -2/3 with 4x or more than total exposures made, and if the exposures exceed 1/30s then dark frames are needed for the Flat Field images. There are other needs as well, and documentation on each exposure.

For all the specifics, please visit their web site at; www.zam.fme.vutbr.cz/~druck/Eclipse

Totality looking to the northwest, 16s before 3rd contact

Cloud cover revealed by the returning sunlight at 3rd contact >

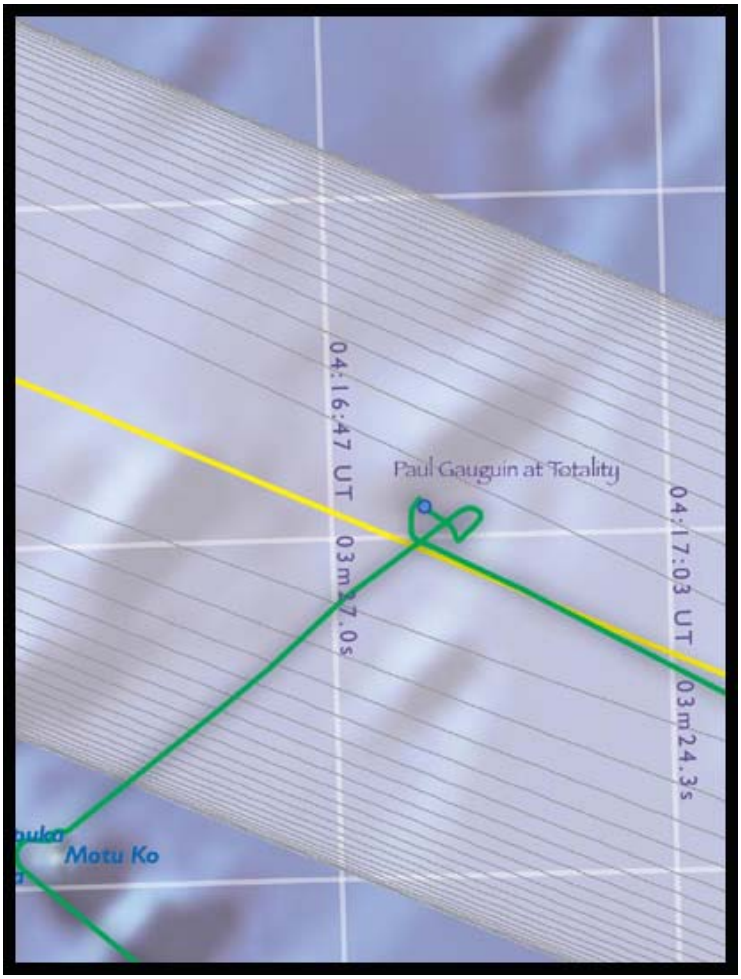
The Milky Way imaged from Entewatak Atoll

POLYNESIA + COOK ISLANDS CRUISE, PAUL GAUGUIN

Near the end of the path of totality, a few tour groups booked passage on the Paul Gauguin, which departed from Tahiti to view the eclipse shortly before sunset. Several clouds prevailed in the region, but the skill of the ships captain and a bit of luck, gave observers an almost complete view of totality.

By: Bill & Denise Kramer
Observing Location: Paul Gauguin Cruise Ship in the South Pacific Ocean near Tahiti, S 9º 53.9' W 164º 43.9'
Duration of Totality: 3m 25s
Web Site: http://www.travelquesttours.com/TourReports/PGChina09/Eclipse2009Home.htm

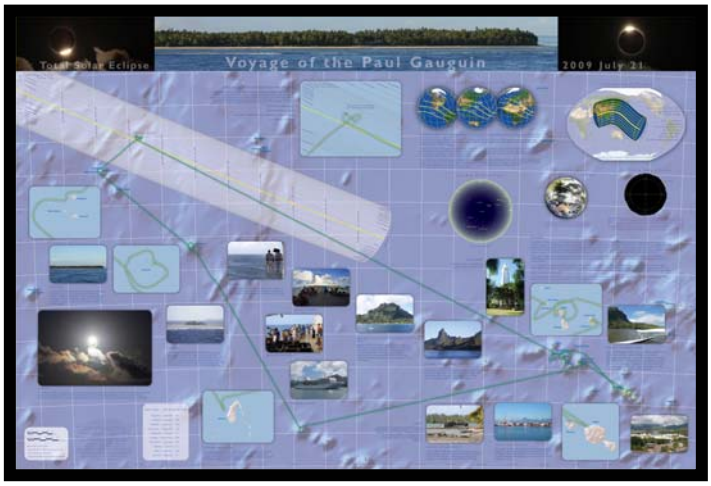
Of all the choices to view the total solar eclipse of July 2009, our selection was to be on board the Paul Gauguin; a luxury cruise ship operated by Regent Cruise Lines in the South Pacific and chartered by Travel Quest International and Wilderness Travel for a 14 day cruise to intercept the eclipse.



Above, a close up of the erratic last minute maneuvering by the captain of the Paul Gauguin in order to dodge the clouds at totality. At right, the entire path of the Paul Gauguin departing from and returning to its port in Tahiti.

Maps used courtesy Michael Zeiler (Michael.zeiler@yahoo.com)

The Paul Gauguin cruise did not afford the longest duration. In fact, the duration was just under three and half minutes with second contact taking place only eight degrees above the horizon. What attracted us to it was the relatively high probability of success. The Paul Gauguin is a fast ship (relatively speaking) and has a very experienced and professional crew. The weather in that part of the world is normally mostly clear. Another way to say it is that there are normally some clouds in the sky. And as one looks towards the horizon the density of clouds appears to increase. No question it was a gamble, and it paid off with a beautiful eclipse. Read the eclipse day story below and click on the smaller pictures to see them in higher resolution.



Photos used by permission and
© Denise and Bill Kramer

Crossing fingers in hope of a hole in the clouds

Seconds after 3rd Contact

< Watching and photographing the partial phase

Now Booking: 2010 Total Solar Eclipse

The eclipse of 2010 July 11 is visible only from the South Pacific, with the exception of a few small projections of reefs and small islands that poke out of the floor of the ocean, with the exception of a small region near the southern end of South America. It passes close to Tahiti where there are a few atolls among the Cook Islands and French Polynesia that fall in the path of totality, and thousands of kilometers later totality envelopes Rapa Nui (Easter Island).

Since solid ground is extremely limited and extremely remote for this eclipse, lodging is very limited, and with thousands of eclipse chasers that are vying for a location within the eclipse path, rates that once seemed reasonable, are soaring. The same thing is also occurring near Tahiti, were a few atolls are also starting to book up. There are worries that there are not enough flights for those already booked, at least for Easter Island, so book with caution. Word is coming from a few tour operators that they will not be booking for this eclipse, and some are even canceling their tours they had previously booked to Easter Island because the price increases.

Tahiti itself lies just outside the eclipse path, and those venturing on the seas will have a chance for 3m 55s of totality just 120 km south of Tahiti, with longer durations the further you travel eastward along the path. Several atolls to the east of Tahiti come very close to the centerline, where duration of totality in excess of 4 minutes is possible.

At the end of the path of totality, one of the last locations on land is near El Calafate, Argentina, likely one of the least expensive trips.

A Classic Tour Collection

http://aclassictour.com

Eclipse Guide > Jay Pasachoff

2010 Solar Eclipse Tour 1 – Peru & Chile

JUN 25 to JUL 13 > 19 day Tour > TOTALITY viewed from Ahu Tongariki, Easter Island
$7478.USD plus $3955.USD for airfare, ex New York (JFK)
http://aclassictour.com/2010-eclipse-tour-1.html

2010 Solar Eclipse Tour II – Chile Including Easter Island

JUL 03 to JUL 11 > 19 day Tour > TOTALITY viewed from Ahu Tongariki, Easter Island
$4590.USD plus $3490.USD for airfare, ex New York (JFK)
http://aclassictour.com/2010-eclipse-tour-2.html

2010 Solar Eclipse Tour III – Santiago and Easter Island

JUL 06 to JUL 13 > 8 day Tour > TOTALITY viewed from Ahu Tongariki, Easter Island
$3595.USD plus $3160.USD for airfare, ex New York (JFK)
http://aclassictour.com/2010-eclipse-tour-3.html

Astro Expeditions

http://www.astro-expeditions.com/tahiti.aspx

Total Solar Eclipse - Tahiti > 6 day tour

JUL 06 > 7 or 8 day tour > TOTALITY 3m 02s from Anaa Atoll, or 4m 19s from Hikueru (additional)
$3369.USD ex Papeete, Tahiti, or $4845.USD ex Los Angeles
£1982.GBP ex Papeete, Tahiti, or £3499.GBP ex London
Tahiti, Moorea and New Zealand extensions available
http://www.astro-expeditions.com/tahiti.aspx

Astronomical Tours

http://www.astronomicaltours.net/2010/index.html

Tahiti Land > 6 day tour < SOLD OUT!

JUL 09 to JUL 14 > TOTALITY 4m 25s from Tatakoko Atoll
$3795.USD ex Papeete, Tahiti
http://www.astronomicaltours.net/2010/Proper/Land/index.html

Tahiti Land II > 7 day tour < SOLD OUT!

JUL 09 to JUL 14 > TOTALITY 4m 25s from Tatakoko Atoll
$3250.USD ex Papeete, Tahiti
http://www.astronomicaltours.net/2010/Tatakoto/index.html

Tahitian Yacht (Tahitian Windward Islands Eclipse Cruise) > 9 day tour < 1 Space Available!

JUL 08 to JUL 16 > TOTALITY viewed from your yacht at sea
$4250.USD ex Papeete, Tahiti
http://www.astronomicaltours.net/2010/Yacht/index.html

Easter Island via Tahiti > 6 day tour < Still Available!

JUL 09 to JUL 14 > TOTALITY 4m 49s viewed from Easter Island
$4995.USD ex Papeete, Tahiti
http://www.astronomicaltours.net/2010/2010Eclipse/itinerary.shtml

Easter Island > 12 day tour < 1 Space Available!

JUL 04 to JUL 15 > TOTALITY 4m 49s viewed from Easter Island
$7695.USD ex La Paz, Bolivia
http://www.astronomicaltours.net/2010/EasterIsland/index.html

Brad Templeton - Private Charter < NEW LISTING!

Private Charter from Houston perhaps aboard a 767-200ER or a 767-ER
http://pic.templetons.com/brad/photo/eclipse10.html
Approximately $3000+
e-mail: btm@templetons.com

- Hao Atoll: 3m 37s
- Easter Island: 4m 44s
- El Calafate : 2m 43s
- Or by air near Tahiti or El Calafate

For TSE2009, Brad was on a private plane to view the eclipse from Enewetak, and he now wants to repeat the experience for TSE2010, and with a chartered plane, he hopes to be able to adjust the viewing location depending on weather conditions a day prior to totality, and as an end all, if the skies are not good anywhere, then eclipse chasers could view the eclipse near sunrise or sunset from the airplane. He is putting together a list of people interested in joining him, on this very unique and affordable trip. Brad is not a travel agent, but he does have some lucrative contacts. Send Bran an e-mail if you are serious about going. He estimates that the 767-200ER plane would be able to seat 174 people, or a 767-ER would seat 80. What more could an "eclipse chaser" want but a plane at their beckon call.

Eclipse City

http://www.eclipse-city.com/

Argentina / Patagonia > Tour 1A Light > 4 day tour

JUL 09 to JUL 12 > TOTALITY 2m 42s from locations near El Calafate, Argentina
Location: 50° 20' 34.3" S, 71° 31' 30.6" W, altitude 800 meters
€1699.EURO ex Buenos Aires, Argentina
http://www.eclipse-city.com/eclipse,patagonia,10087.html

Argentina / Patagonia > Tour 1A Basic > 6 day tour

JUL 08 to JUL 13 > TOTALITY 2m 42s from locations near El Calafate, Argentina
Location: 50° 20' 34.3" S, 71° 31' 30.6" W, altitude 800 meters
€1999.EURO ex Buenos Aires, Argentina
Extensions available for; Valdes Peninsula, San Carlos de Bariloche, Iguazu Falls,
also an eclipse round trip flight from El Calafate to view the eclipse from the air €399 to €2,299
http://www.eclipse-city.com/eclipse,patagonia,10087.html

French Polynesia – Tuamoto Archipelago, Tatakoto Atoll > Program 2 > 7 day tour

JUL 07 to JUL 13 > TOTALITY 4m 35s from Tatakoto Atoll
€4990.EURO ex Papeete, French Polynesia
Extension available to Bora-Bora
http://www.eclipse-city.com/eclipse,french_polynesia,10086.html

Chile – Ground Based Eclipse Observation from Easter Island > 36 hour tour

JUL 10 to JUL 12 > TOTALITY 4m 46s from Anakena Beach, Easter Island
€3499.EURO ex Santiago, Chile
Extension available to Atacama Dessert
http://www.eclipse-city.com/index.php?templang=2&page=10088

Eclipse Traveler

http://www.eclipsetraveler.com/?gclid=CJKiy7yc0ZwCFRghDQodrQh0Hg

2010 Tahiti > 5 day tour

JUL 07 to JUL 11 > TOTALITY 3m 37s from Hao Atoll
$3395.USD ex Papeete, French Polynesia, RT air from LAX available for $1633.USD
http://www.eclipsetraveler.com/solar_eclipse_tours_2010/Solar_eclipse_2010_tours/2010_solar_eclipse_tahiti_tour_short_sofitel.htm

2010 Tahiti & Moorea > 6 day tour

JUL 09 to JUL 14 > TOTALITY 3m 37s from Hao Atoll
$3995.USD ex Papeete, French Polynesia, RT air from LAX available for $1633.USD
http://www.eclipsetraveler.com/solar_eclipse_tours_2010/Solar_eclipse_2010_tours/2010_solar_eclipse_tahiti_tour_short.htm

2010 Tahiti, Moorea and Bora-Bora > 9 day tour

JUL 09 to JUL 17 > TOTALITY 3m 37s from Hao Atoll
$6645.USD ex Papeete, French Polynesia, RT air from LAX available for $1633.USD
http://www.eclipsetraveler.com/solar_eclipse_tours_2010/Solar_eclipse_2010_tours/2010_solar_eclipse_tahiti_tour.htm

Explorers Astronomy Tours

http://www.explorerseclipse.co.uk/

Atacama, Easter Island & Eclipse SES2 > 13 day tour

JUL 02 to JUL 14 > TOTALITY ~4m 37s from Easter Island
$8810.USD ex Santiago
http://www.explore.co.uk/holidays/Tour%20Detail?ItineraryId=1105

Easter Island, Eclipse and Atacama Adventure SES3 > 13 day tour

JUL 08 to JUL 20 > TOTALITY ~4m 37s from Easter Island
$8810.USD ex Santiago
http://www.explore.co.uk/holidays/Tour%20Detail?ItineraryId=1104

Easter Island Eclipse and Chilean Highlights SES4 > 13 day tour
JUL 06 to JUL 18 > TOTALITY ~4m 37s from Easter Island
$8000.USD ex Santiago
http://www.explore.co.uk/holidays/Tour%20Detail?ItineraryId=1104

Tahiti and the Tuamotu Islands > 12 day tour
JUL 06 to JUL 17 > TOTALITY ~3m 37s from Hao Atoll
£2699.GBP ex Papeete or £3999.GBP ex London
http://www.explorerseclipse.co.uk/DOWNLOADS/trip_notes/Tahiti%20and%20the%20Tuamotu%20Islands.pdf

Tahiti, the Tuamotus and Easter Island > 19 day tour < SOLD OUT!
JUL 06 to JUL 24 > TOTALITY ~3m 37s from Hao Atoll
Prices N/A - ex Papeete or ex London
http://www.explorerseclipse.co.uk/DOWNLOADS/trip_notes/Tahiti,%20The%20Tuamtus%20and%20Easter%20Island.pdf

Tahiti, the Tuamotus and California > 19 day tour
JUL 06 to JUL 24 > TOTALITY ~3m 37s from Hao Atoll
£3499.GBP ex Papeete or £4999.GBP ex London
http://www.explorerseclipse.co.uk/DOWNLOADS/trip_notes/Tahiti%20and%20Californian%20Highlights.pdf

Honu Eclipse - Total Solar Eclipse Festival

http://www.honueclipse.org/home/

Note: OK, this is not a travel group, but camping and entertainment is available with this group, but airfare still needs to be secured, and airfare during this time frame is very limited

• **$700.USD** Until 1st of February 2010 ($100 Reservation deposit plus $600 balance before 1st Feb)
• **$800.USD** Door price and only presale price from 2nd February 2010 ahead

- The festival ticket includes free camping from the 1st to the 15th of July 2010
- Festival Dates : 7 – 13 July, 2010 (7 days of music, arts, and culture)
- Camping Dates : 1 – 15 July 2010 (Free to all festival ticket holders)
- Venue: 50 Hectares of private grounds on the slopes of the islands highest volcano. Approximately 7km from the town Hanga Roa. The venue has excellent visibility for the eclipse, and boasts sea views with incredible sunsets every day

Journeys Worldwide (AU)

http://www.journeysworldwide.com.au/

SE 11 – 18 day trip to Peru, Bolivia & Easter Island
JUN 27 to JUL 18 ~4m 45s TOTALITY from Easter Island
$11,975.AUD ex Santiago, or $13,795 ex Auckland/Sydney
http://www.journeysworldwide.com.au/pdf/jw-eclipse.pdf

EI 11 – 5 day trip to Santiago & Easter Island
JUN 27 to JUL 18 ~4m 45s TOTALITY from Easter Island
$6,975.AUD ex Auckland/Sydney
http://www.journeysworldwide.com.au/pdf/jw-eclipse.pdf

Pacific Expeditions

http://www.pacific-expeditions.com

Mangaia Island Solar Eclipse Tour > Cook Islands > TOTALITY ~ 3m
JUL 27 to JUL 18 - NO totality is visible from Tahiti [proper]
$1950.USD
http://www.pacific-expeditions.com/voyage_options/mangaia_eclipse.asp

Rick Brown's Eclipse Safaris < NEW LISTINGS!

http://www.eclipse-chasers.com/esafari/default.html

Land Only – 7 Nights on Tahiti & Moorea

JUL 8 to JUL 15 - NO totality is visible from Tahiti [proper]
$2299.USD

Land and Air to/from Tahiti Only – 7 Nights

JUL 08 to JUL 15 - NO totality is visible from Tahiti [proper]
$4100.USD

EFLIGHT 2010 – 7 hour flight from Papeete r/t

JUL 11 ~ 9m 38s TOTALITY from aboard an Airbus 319CJ/LR
$6500.USD ea. with 2 to a window, or $9000.USD ea. for a window to yourself
The complete package trip will run about $22,000.USD for 2 people
http://www.eclipse-chasers.com/esafari/poly2010.html
Detailed info about EFLIGHT 2010 is available at;
http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/TSE2010/EFLIGHT2010.html

Ring of Fire Expeditions

Eclipse Guide > Paul D. Maley

Air/Tour #1: Tahiti and Hikueru Atoll – 6 day trip < SOLD OUT!

JUL 06 to JUL 11 – 4m 22s TOTALITY from Kikueru Atoll
$2999.USD and up, ex Papeete, Tahiti, RT air from Los Angeles is available starting at $1624
http://www.eclipsetours.com/tahitifly.html

Air/Tour #2: Tahiti and Hao Island – 6 day trip < SOLD OUT!

JUL 06 to JUL 11 – 3m 39s TOTALITY from Kikueru Atoll
$3050.USD and up, ex Papeete, Tahiti, RT air from Los Angeles is available starting at $1624
http://www.eclipsetours.com/tahitifly2.html

Tour #3: Tahiti and Hikueru Atoll – 15 day trip aboard the Aranui 3 vessel < SOLD OUT!

JUN 28 to JUL 12 – possibly 4m 22s of TOTALITY dependent upon final location
$5699.USD and up, ex Papeete, Tahiti, RT air from Los Angeles is available starting at $1624
http://www.eclipsetours.com/tahitiship.html

Sirius Travel

Eclipse Tour 2010 – Easter Island < Cancelled

http://www.siriustravel.com/easterisland10/index.cfm

- There was word in mid October that this tour has been canceled by this tour operator, but they were offering their airfares that they had acquired, they translate to;
- Round Trip – LAX (Los Angeles) to SCL (Santiago, Chile) and SCL to IPC (Easter Island)
  JUL 08 to JUL 15 - $3550.USD (40 available at that time)
- Round Trip – SCL (Santiago, Chile) to IPC (Easter Island)
  JUL 10 to JUL 14 - $2915.USD (10 available at that time)

South America Classic Tours

http://www.solar-eclipse-tours.eu/2010_eclipse_program_en.pdf

9 Days Eclipse – Tour Easter Island, Chile

JUL 06 to JUL 14 – 4m 39s of TOTALITY from Easter Island
$6625.USD, ex Santiago, Chile
http://www.solar-eclipse-tours.eu/2010_eclipse_program_en.pdf

TravelQuest International

http://www.tq-international.com/index.htm

Easter Island Total Solar Eclipse 2010 < Still Available!

JUL 05 to JUL 13 – 4m 39s of TOTALITY from Easter Island
$7990.USD and up, ex Santiago, Chile
http://www.travelquesttours.com/EasterIsland2010/Easter_Island_Total_Solar_Eclipse_2010_home.htm

French Polynesia Voyage to Totality > 8 day trip < Still Available!

JUL 06 to JUL 13 > TOTALITY 4m 01s aboard the m/s Paul Gauguin
$4695.USD until March 6, 2010, then $6595.USD and up, ex Papeete, Tahiti
http://www.travelquesttours.com/FrenchPoly2010/NCIhome.htm

Cook Islands Total Solar Eclipse 2010 > 9 Days < Still Available!

JUL 05 to JUL 13 – 3m 19s of TOTALITY from Mangaia Island
$2790.USD, $3290.USD , $3490.USD and up, ex Rarotonga, Cook Islands
http://www.travelquesttours.com/CookIslands2010/NCIhome.htm

Extensions available for; **Cook Island of Aitutaki**
New Zealand
Easter Island

Tropical Sails Corp

http://www.tropicalsails.com/

Pacific Anaa Atoll Solar Eclipse July 11, 2010 > 14-day trip < SOLD OUT!

JUN 29 to JUL 12 – 3m 19s of TOTALITY from Mangaia Island
$2079.USD plus $180.USD for Port and Cruise taxes, ex Papeete, Tahiti
http://tropicalsails.com/2010-Solar-Eclipse-Cruise.pdf

Twilight Tours

http://sciencecenter.net/twilighttours/

Easter Island / Chile Solar Eclipse Expedition – Tour A > 8-day trip

JUL 06 to JUL 13 – over 4m 45s TOTALITY on Easter Island
$6475.USD ex Santiago, Chile
http://www.sciencecenter.net/twilighttours/201007/itinerary.pdf

Easter Island / Chile Solar Eclipse Expedition – Tour B > 9-day trip

JUL 05 to JUL 13 – over 4m 45s TOTALITY on Easter Island
$6825.USD ex Santiago, Chile
http://www.sciencecenter.net/twilighttours/201007/index.htm

Wildlife Worldwide (UK)

http://www.wildlifeworldwide.com/home.html

Eclipse Guide > Prof. John Parkinson

Total Solar Eclipse – Easter Island - July 2010 >14-day trip

JUL 07 to JUL 21 – over 4m 45s TOTALITY on Easter Island
£5795.GBP ex London, Heathrow
http://www.wildlifeworldwide.com/holiday/total_solar_eclipse_easter_island.html

Winco Eclipse Tours, Inc.

http://www.wincoeclipsetours.com/

Eclipse Guides > Peter R. Leavitt CCM & Dr. James C, LoPresto

French Polynesia 2010 Eclipse Cruise >14-day trip

JUL 04 to JUL 18 – 4m 20s TOTALITY on Hikueru
$6995.USD ex Papeete, Tahiti (air ex. LAX available for $995 RT)
3 yachts with 10 passengers each
Extensions available to Bora Bora
http://www.wincoeclipsetours.com/id70.htm

Now Planning: 2012 Total Solar Eclipse

The eclipse of 2012 November 13 will be visible from northeastern Australia near sunrise, and the path continues out across the South Pacific. It passes north of New Zealand, and still further east the eclipse reaches maximum duration.

A Classic Tours Collection

http://aclassictour.com

Eclipse Guide > Jay Pasachoff

2012 Solar Eclipse to Port Douglas, Australia

Dates and costs TBD

Tropical Sails Corp NEW LISTINGS!

http://www.tropicalsails.com/

Solar Eclipse Cruise > 4-night trip aboard the Coral Princess

NOV 13 to NOV 17 - TOTALITY
$2196.AUD to $2796.AUD ex Cairns, Australia
http://www.tropicalsails.com/2012/page3.html

Solar Eclipse Cruise > 6-night trip aboard the Coral Princess II

NOV 10 to NOV 16 – TOTALITY
$3499.AUD to $4599.AUD ex Cairns, Australia
http://www.tropicalsails.com/2012/page2.html

Solar Eclipse Backpacker Budget Tour > Alpha / Northbound

NOV 01 to NOV 15 – TOTALITY from Cairns
$3295.AUD, begins at Brisbane, ends at Cairns, Australia
http://www.tropicalsails.com/2012/page4.html

Solar Eclipse Backpacker Budget Tour > Beta / Southbound

NOV 11 to NOV 26 – TOTALITY from Cairns
$3295.AUD, begins at Cairns, ends at Brisbane, Australia
http://www.tropicalsails.com/2012/page4.html

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. More listings will be added when they become available and be indicated with a **NEW LISTING!** value on the previous pages.

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.

Eclipse Specialty Tour Group Web Sites . . .

A Classic Tours Collection
http://aclassictour.com
Eclipse City
http://www.eclipse-city.com/
Far Horizons
http://www.farhorizon.com/2006-solar-eclipse.htm
Mayhugh Travel – Astronomy Vacations
http://astronomyvacations.com/
MWT Associates (Astronomical Tours)
http://www.melitatrips.com/
Ring of Fire Expeditions
http://www.eclipsetours.com
Sirius Travel
http://www.siriustravel.com/
Sita World Tours - Solar Eclipse Tours
http://www.eclipsetours.net/
Spears Travel
http://www.spearstravel.com/astronomy/
TravelQuest International
http://www.tq-international.com/index.htm
Travel Wizard
http://www.travelwizardtravel.com/astro.htm
Winco Eclipse Tours, Inc.
http://www.wincoeclipsetours.com

Other Useful Eclipse Web Sites . . .

NASA Eclipse Home Page
http://eclipse.gsfc.nasa.gov/eclipse.html
Fred Espenak's Web Site
http://www.mreclipse.com/
Jay Anderson – Eclipse Weather Predictions
http://home.cc.umanitoba.ca/~jander/
Xavier Jubier's Google Earth Eclipse Maps
http://xjubier.free.fr/en/site_pages/SolarEclipsesGoogleMaps.html
International Astronomical Union - Solar Eclipse Working Group
http://www.eclipses.info/
Jay Pasachoff – Past Eclipse Expeditions
http://www.williams.edu/Astronomy/eclipse/
Sheridan Williams's Web Site
http://www.clock-tower.com/
Eclipses Online – HMNAO, CCLRC
http://www.eclipse.org.uk/
Glenn Schneider: Umbraphile
http://nicmosis.as.arizona.edu:8000/UMBRAPHILLIA.html
Bill Kramer's – Eclipse Chasers Web Site
http://www.eclipse-chasers.com/
Where In the World Are the Eclipse Chasers?
http://www.eclipse-chasers.com/where.htm
Dan McGlaun's – Eclipse2017.org
http://www.eclipse2017.org/
Jeffrey R. Charles – Eclipse Chaser Journal
http://www.eclipsechaser.com/

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Eclipse Weather Predictions by **Jay Anderson**
Google Eclipse Maps by **Xavier M. Jubier**
Additional Eclipse Maps by **Michael Zeiler**

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Jay Pasachoff

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Some future 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 128 dpi.

Please send any correspondence, suggestions or submissions to TOTALITYnewzine@aol.com.

Photo submissions can also be sent to the TOTALITYnewzine@aol.com; please format @128 dpi.