

# TOTALITY!

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



2008 Eclipse Path

Map courtesy Xavier M. Jubier & Google Maps

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# THE POLAR-ASIAN EXPRESS; THE 2008 AUGUST 01 TOTAL SOLAR ECLIPSE & WEATHER PROSPECTS

Three total solar eclipses come in 3 consecutive years, and each slightly less than a year apart from the previous, beginning in 2008. The path of an eclipse often covers a slender strip that transgresses across one-third of the globe, and therefore often passes over both land and sea. The path may encounter a few major cities, but more often than not it crosses remote regions of the world. The next three eclipses embody this reality, and all three will be great adventures in their own rite. We present the first in this issue, and the other two eclipses will follow in future issues to be released yet this year. They are already in production. If you can only see one of these, which one would it be? I can't decide that one for you, as everyone has their own personal preferences, but I hope with the aid of these articles, you might be able to make an informed decision on where you want to go for your best trip and the best location to view these eclipses. Even if you can make it to all there, where should you go for your best chances of seeing the eclipse, and what other attractions will be available? This is the objective of these articles.

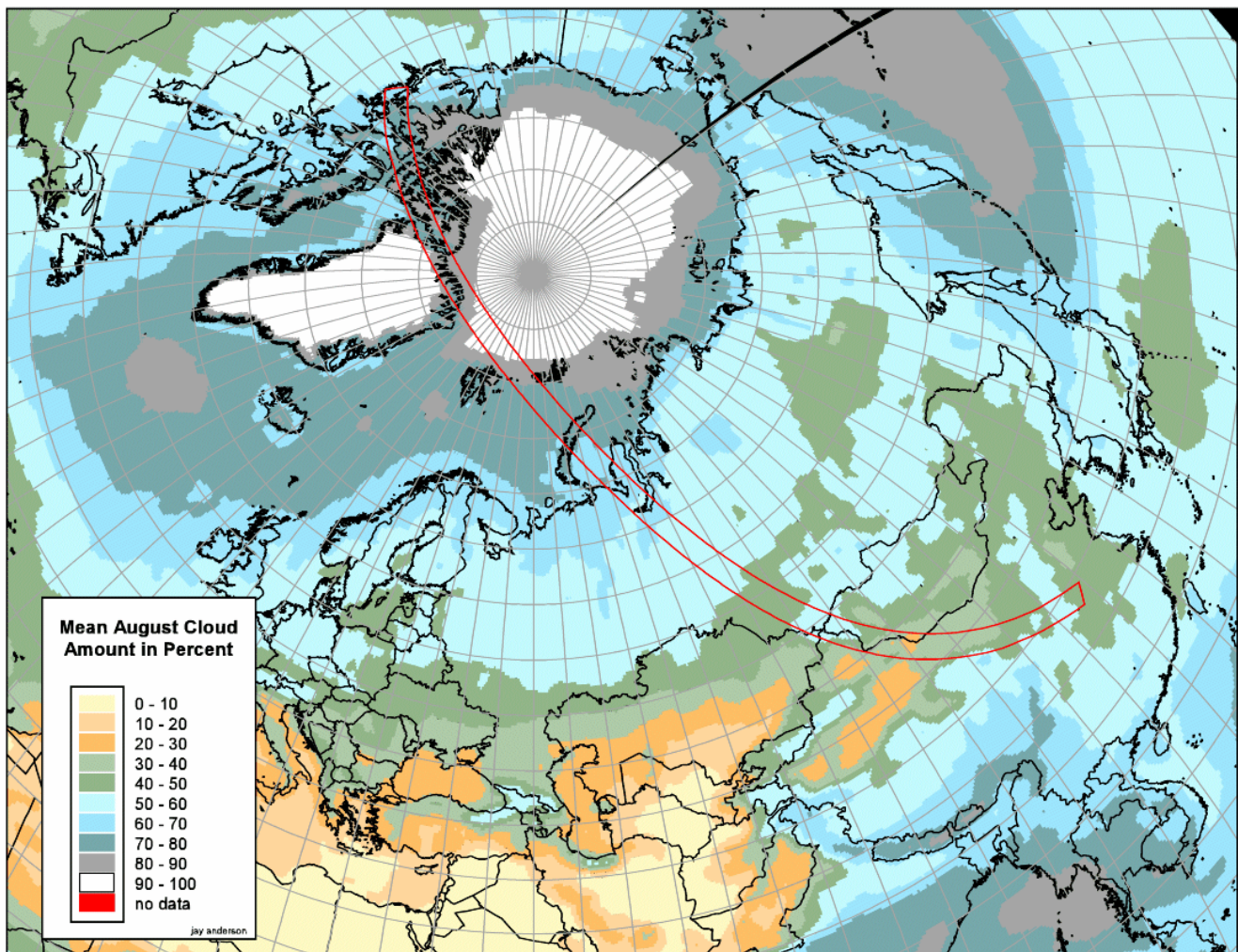
The 2009 eclipse is one that many are greatly anticipating. No, that wasn't a typo! The 2009 eclipse will be the longest duration of totality this century, and many will flock to the region in China and the western Pacific in order to be a part of that. In a small region along the path of the 2008 eclipse, some of the best predicted chance of good weather may be available, as good or better than any eclipse in the next 10 years. This little morsel of information makes the 2 minutes of totality near that location very enticing. More about the weather conditions can be found in the article immediately following this one. Firstly we will look at the locations where the 2008 August 01 eclipse can be viewed and some of the locations that some of the tour groups are scheduled to travel to and view from.

A partial eclipse is visible from the entire Asian continent, and nearly all of Europe, Greenland and the northeastern portions of Canada. The path of totality however begins in a remote area of Nunavut province, along the north shore of northeastern Canada. The path crosses over frozen land and waterways on its way nearest to, but just missing, the North Pole. It is closest to the pole as it clips the northern coast of Greenland before beginning its descent through the latitudes as the arcs returns southward. The edge of totality clips the western shores of Franz Joseph Land, transverses the Kara Sea, and centrally crosses Novaya Zemlya Island, the Barents

Sea and comes ashore along the northern coast of Russia. Here it enters Siberia and heads for the Western Siberia Lowlands. Here the path briefly straddles the borders of four countries, along with Russia, China, Mongolia and Kazakhstan before the path curves southeastward through central China.

## Weather:

The location of the path of the 2008 total solar eclipse passes through various weather regions, from the arctic North Pole to the Gobi Desert of Mongolia and China. For this reason, the weather prospects transform from the practically the worst of conditions to the best of conditions.



Map courtesy Jay Anderson of Environment Canada

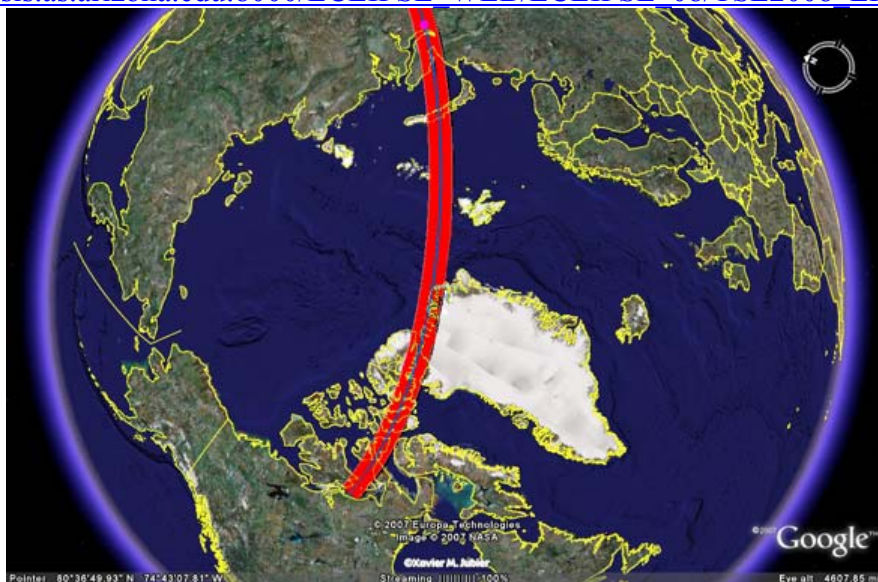
Jay Anderson, a meteorologist from Environment Canada in Winnipeg, is known around the world as “the” eclipse forecaster. On his web site he has generalized maps for each month, of the world’s cloud cover statistics. Prior to each eclipse, he creates a map and graph specific to the mean weather conditions for that date. The graphs and charts in this article are directly from his work, please visit his site at; <http://home.cc.umanitoba.ca/~jander/>

## “Above” the North Pole

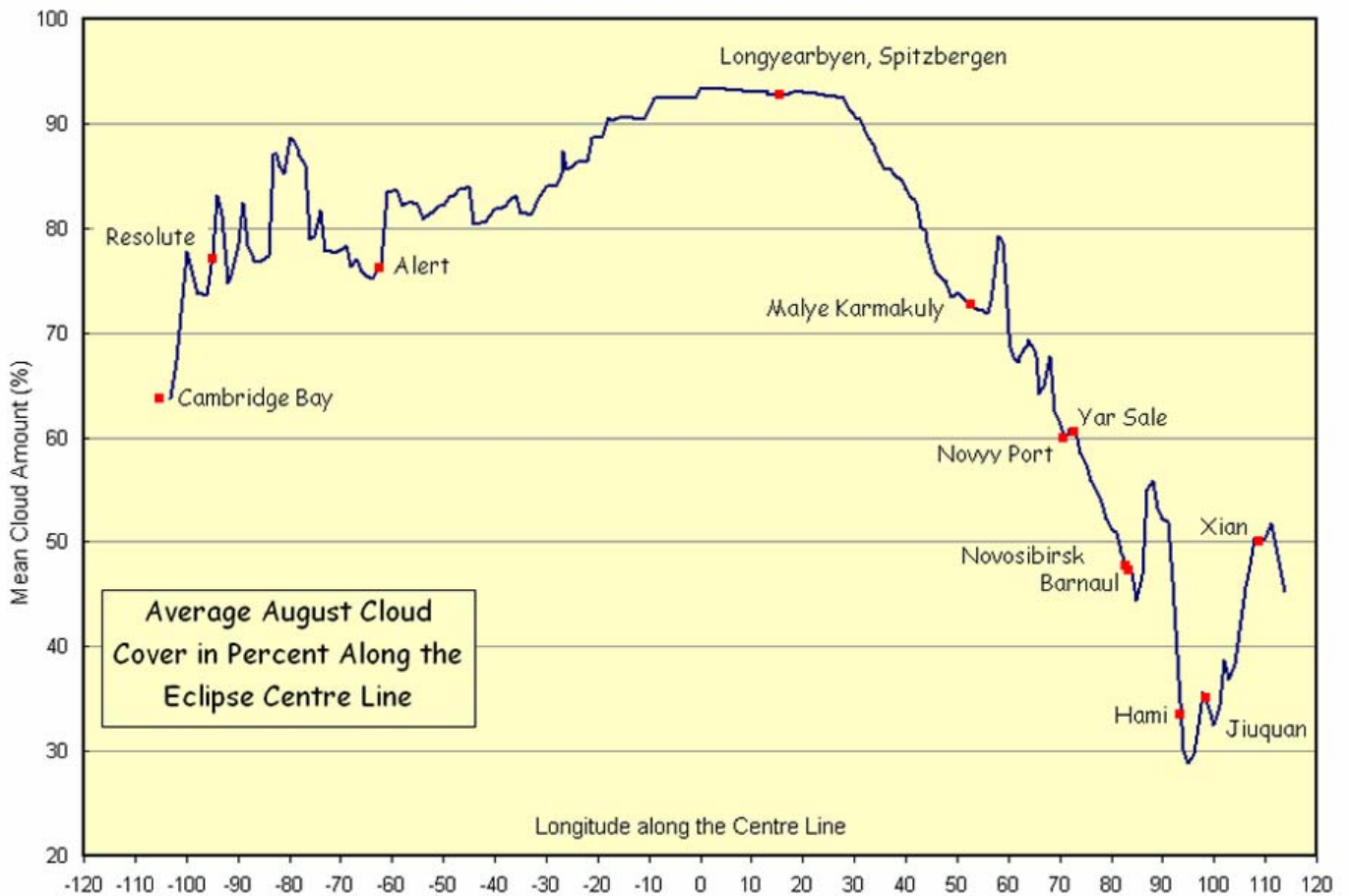
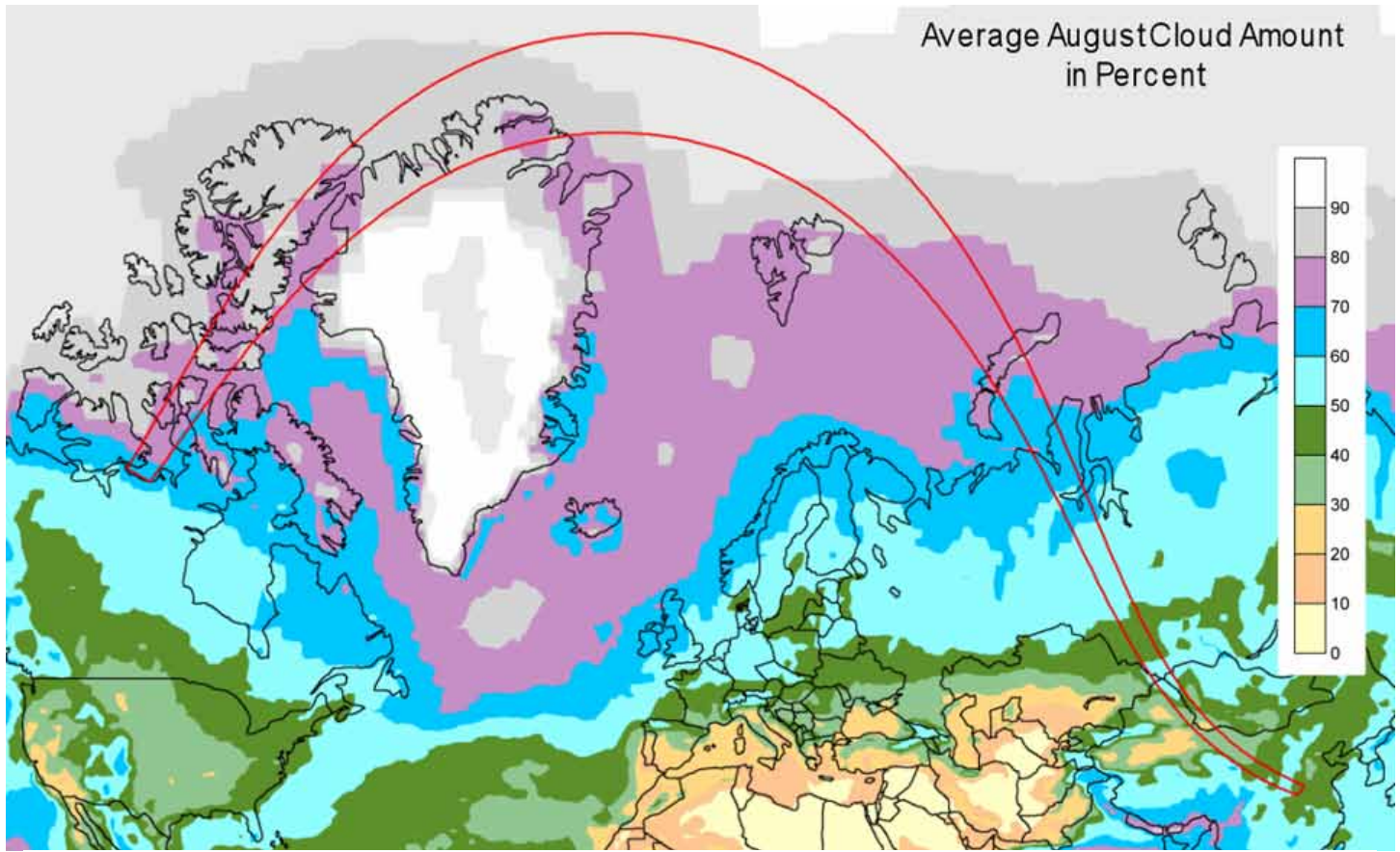
Becoming popular with solar eclipses near the poles are the solar eclipse flights. An airplane flying at 35,000 feet or more above the Earth, practically guarantees clear weather, with the clouds below your feet. The clouds over this region during the summer months lie at altitudes between 6 and 9 kilometers, below the projected altitude of the airplane. An airplane can fly directly into the path of totality, and because of the additional altitude, and the plane moving at a significant velocity with the general direction of the Moon’s shadow, the duration of totality can be extended beyond its earthly maximum. Of course any observations and photographs will be out of a small window. Others have been successful in getting decent pictures doing this in the past. Airlines booking these flights usually take extra care to be sure that the windows will be well cleaned before hand. Since only one side of the plane will be facing the Sun, groups are usually limited to how many “rows” are available, rather than how many seats are available, as well as which rows will be sold based on window placement, and thus the plane will have a number of empty seats. The Sun must be no higher than 30 degrees above the horizon in order to make viewing possible.

The Airbus 330-200 is slated to take off from Köln, Germany at 4:03 am, do flightseeing over Svalbard, head on to fly over the North Pole, then loop back around to set up to start the “eclipse run”. If conditions are as expected, the flight will return to a region north of Svalbard to encounter the Moon’s shadow, and totality could last up to 3 minutes from here. The duration of totality could be shorter if the eclipse is forced to be encountered further west, but the duration is still expected to exceed the maximum length available anywhere on the ground. For much more information and specific details on viewing this eclipse from the air, visit Dr. Glenn Schneider’s web site at;

[http://nicmosis.as.arizona.edu:8000/ECLIPSE WEB/ECLIPSE\\_08/TSE2008\\_EFLIGHT.html](http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_08/TSE2008_EFLIGHT.html)



2008 Total Solar Eclipse Path and the North Pole  
Original Map courtesy Xavier M. Jubier & Google Earth



# Novaya Zemlya

For the adventuresome, and those with deep pockets, eclipse chasers can be whisked to the geographic North Pole aboard the Russian nuclear powered Icebreaker Yamal. Only 99 years earlier, Admiral Robert Peary and Matthew Henson took weeks to trek across the arctic icepack with dogsledges carrying supplies to accomplish this great feat, on April 6, 1909, after 18 years of attempts and planning. Afterward the Yamal returns to open water to attempt to locate the best position for viewing the eclipse. Observing may be possible from the shores of Novaya Zemlya, and likely near the base of a glacier, for those willing to hop in a Zodiac to take their equipment ashore. If the seas are too rough to go ashore, observing will be from the deck of the icebreaker, either in the Barents or Kara Seas. Totality in this region could bring an observer a potential duration of 2m 23s.

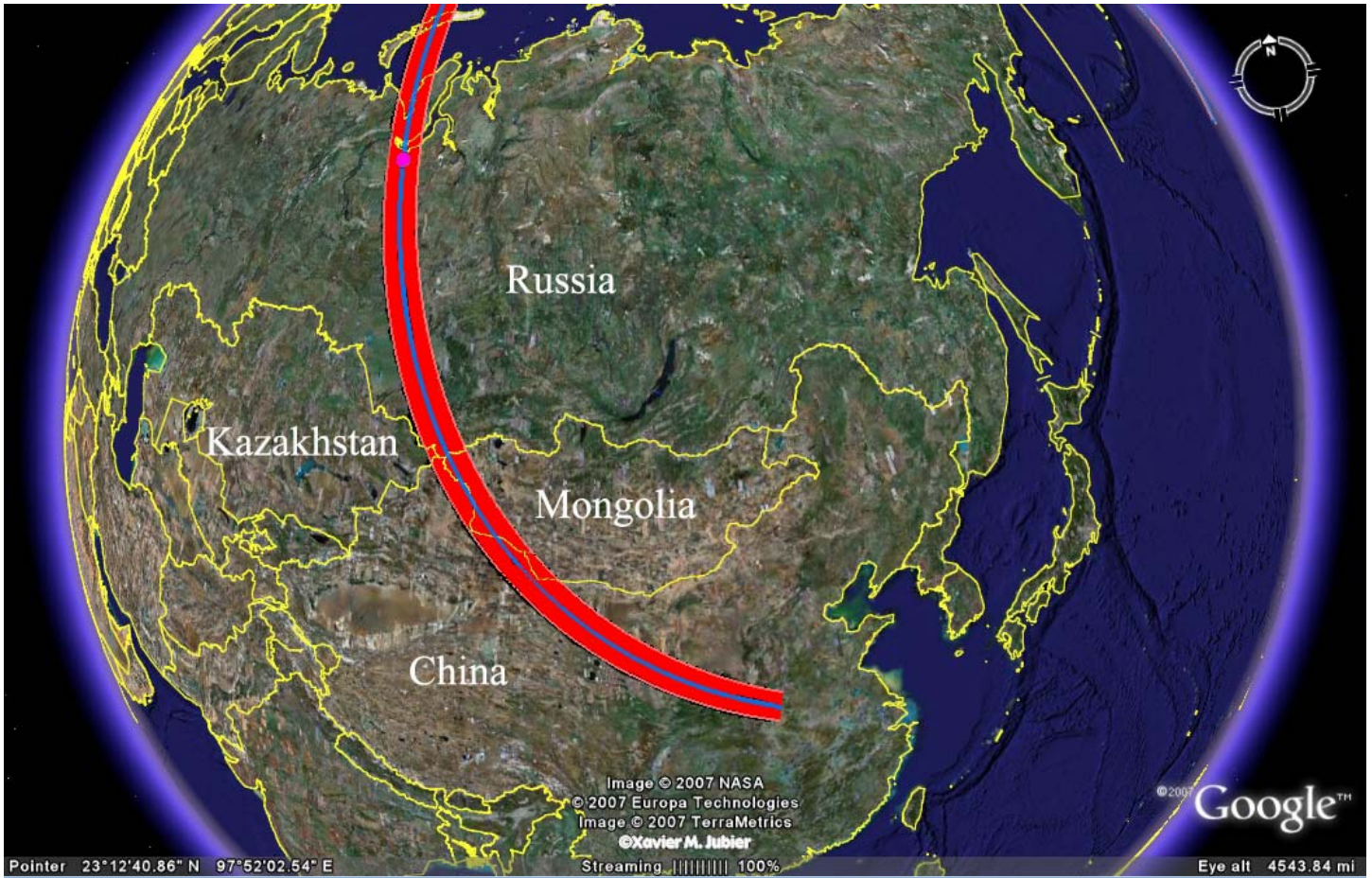
## Weather:

Weather conditions across the polar areas are very poor, ranging from 70 to 100 percent cloud cover. The path of totality touches the northern shore of Greenland, where the chance of clear skies or spotty clouds, are near 10 percent. The closest the path comes to the pole, is even worse! When the path encounters Novaya Zemilya, the conditions improve marginally, and conditions shift to a 70 to 80 percent chance of clouds, but just off the southern shore of Novaya Zemilya and well into the Mainland of Russia, the odds begin to improve and shift a notch to the 60 to 70 percent chance of cloud-cover.



2008 Total Solar Eclipse Path across Novaya Zemlya and the coast of Russia  
Original Map courtesy Xavier M. Jubier & Google Maps

These far north locations could make for a rather unique experience, whether you see the eclipse or not. Somewhere, sometime, the ultimate astronomical event will occur, and around the areas here and southward well into Russia, it could happen. The odds are very slim that it would happen, but at latitudes such as these, there is always a chance of an aurora. An aurora during a total solar eclipse would be awesome. Of course the circumstances need to be just right. I have never heard of this ever being documented before, but it could happen, if a solar flare ignites a CME, or a coronal hole is pointed at the Earth at just the right time. After all, a comet was discovered during the total solar eclipse of 1882!



2008 Total Solar Eclipse through Asia

Original Map courtesy Xavier M. Jubier & Google Earth

## Russia

The Moon's shadow soon transgresses onto the mainland of northern Russia where the centerline encounters the northern shore at Marresale, with a duration only a fraction of a second under the 2m 27.2s maximum, which itself occurs near Nadym, Russia. Although the duration is longest in this area, most tour groups viewing from Russia will do so in the southern part of Western Siberia.

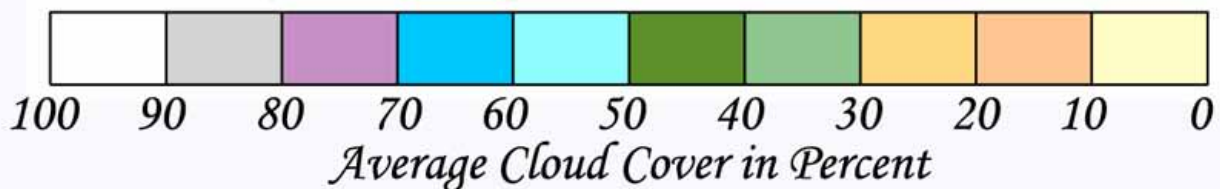
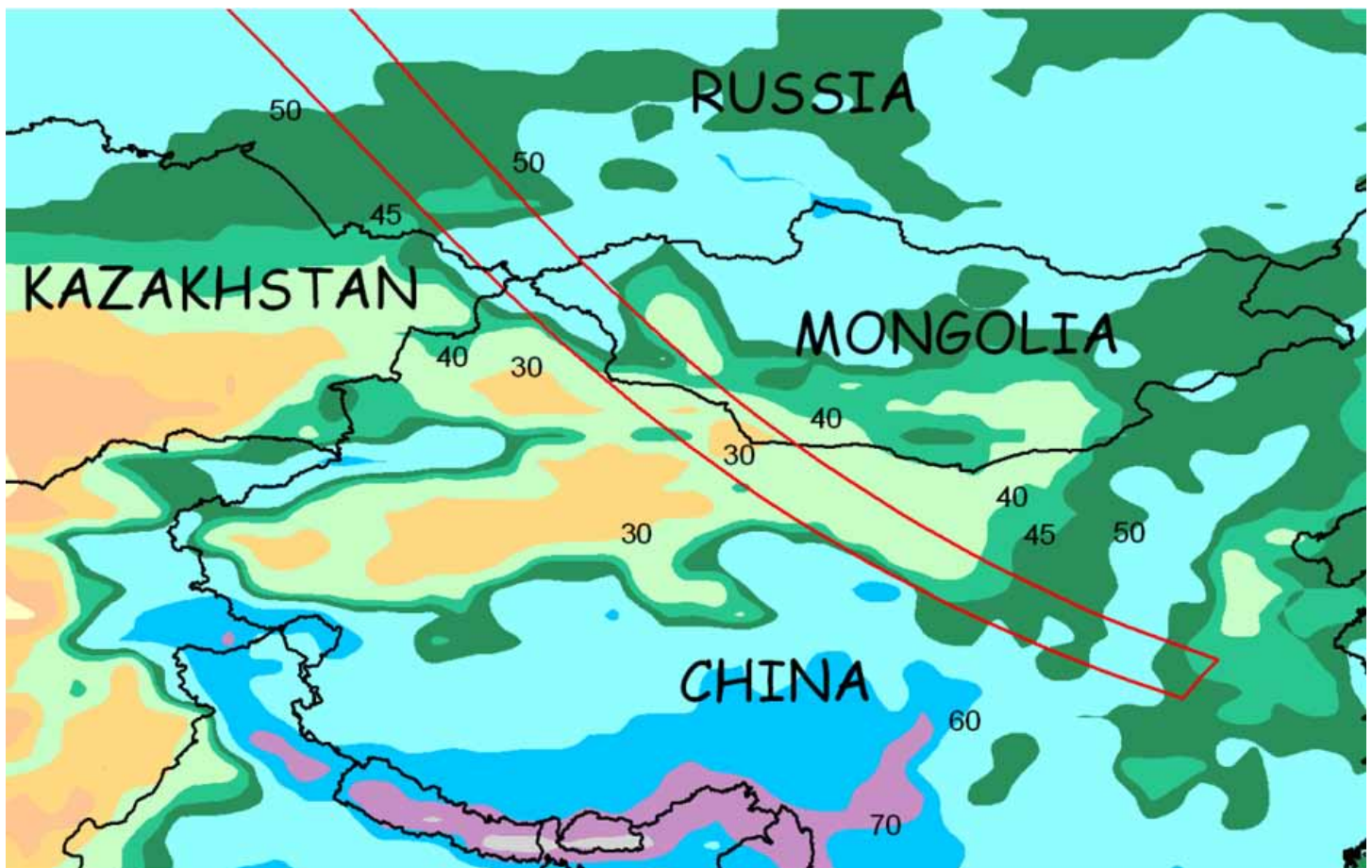
## Weather:

Conditions improve as the eclipse path moves further south into Russia, and in the Western Siberia region, the percentage becomes an acceptable 40 to 50 percent cloud cover.

Two Russian cities in this region where some tour groups near the centerline will experience totality are, Novosibirsk, where totality lasts for 2m 18s, and in Barnaul where the duration is 2m 16s. Many groups however will be going even further south, into China and Mongolia, even though the duration will be shorter. This is due to the far better chances of seeing totality as the weather conditions continue to improve.

## Weather:

As the path approaches where the four countries meet, the conditions drop back to 50 to 60 percent chance of clouds being present.



Map courtesy Jay Anderson of Environment Canada





2008 Total Solar Eclipse Path at the four corners

Map modified from the original by Xavier M. Jubier & Google Maps

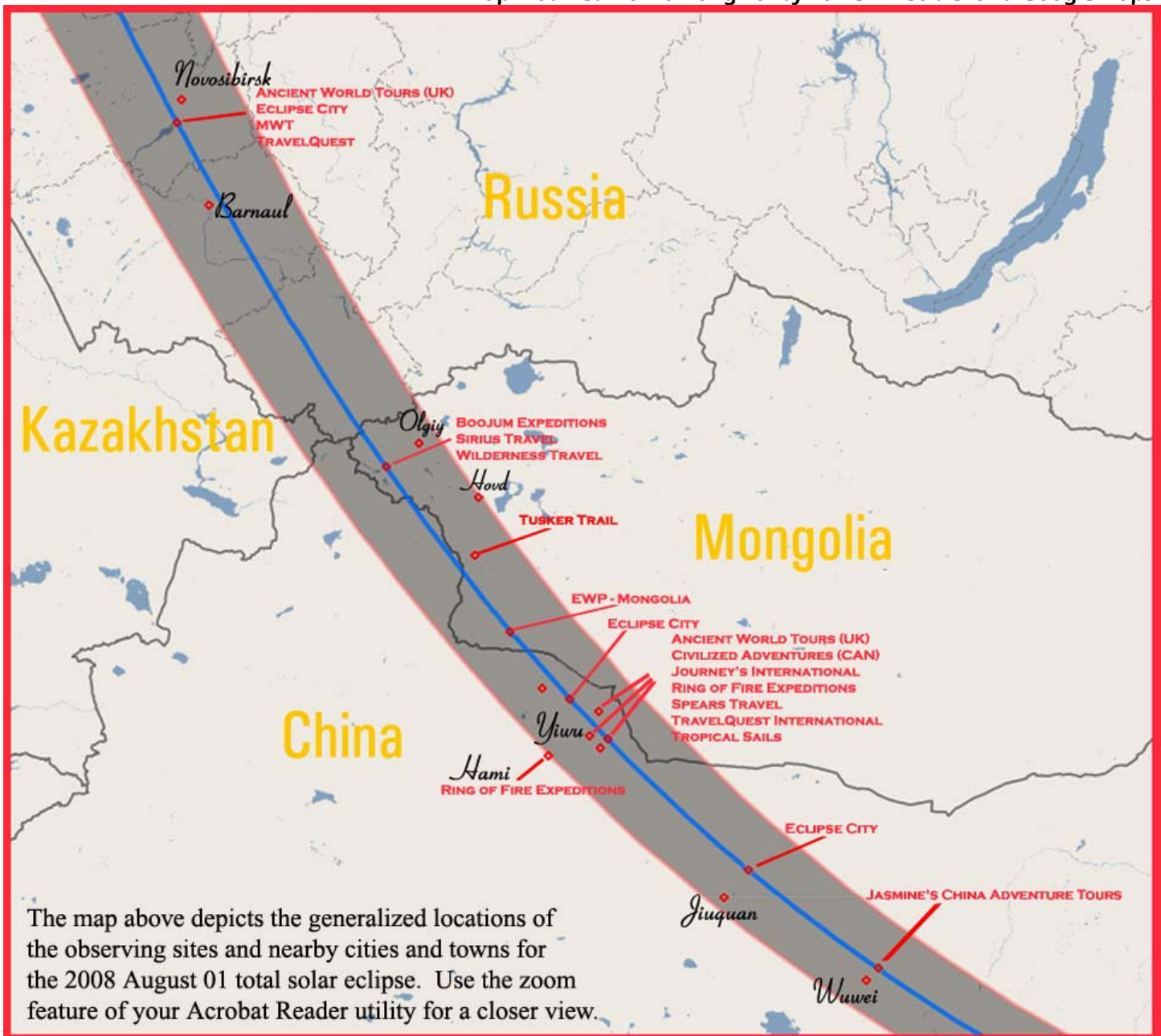
City / Town	Latitude	Longitude	Altitude	Duration of Totality
Chemal	51° 25' N	86° 00' E	808 m	2 min 15 sec
Ongyday	50° 45' N	86° 27' E	819 m	2 min 10 sec
Inya	50° 28' N	86° 27' E	772 m	2 min 12 sec
Lake Shavlinskoye	50° 14' N	87° 12' E	1903 m	2 min 13 sec
Chibit	50° 19' N	87° 31' E	1304 m	2 min 10 sec
Kosh-Agach	50° 00' N	88° 40' E	1747 m	1 min 47 sec
Beleshi	49° 43' N	87° 25' E	1591 m	2 min 11 sec
Olgii	48° 58' N	89° 58' E	1988 m	1 min 36 sec
Bor-Üdzüür	45° 48' N	92° 17' E	1309 m	2 min 02 sec
Bij Altay	45° 33' N	93° 45' E	1744 m	1 min 26 sec
Laoyemiao	44° 42' N	94° 01' E	804 m	1 min 49 sec
Santanghu	44° 14' N	93° 20' E	1034 m	1 min 57 sec
Naomaohu	43° 46' N	94° 58' E	465 m	1 min 56 sec
Yiwu	43° 15' N	94° 41' E	998 m	1 min 55 sec
Xiamaya	43° 12' N	95° 14' E	998 m	1 min 58 sec
Shangmaya	43° 00' N	95° 00' E	1977 m	1 min 55 sec
Qincheng	42° 47' N	94° 36' E	1705 m	1 min 38 sec

## Along the Mongolia / China Border

Although not on the centerline, the easternmost point of Kazakhstan falls inside the path. The Altay Mountains lead from Russia across the borders into Mongolia and China.

The Hovd Gol region of Mongolia is where the centerline crosses over from Russia where the borders of China and Mongolia snakes back and forth across the centerline, shifting which country crosses this ephemeral path, for 160 kilometers before crossing the border into China for 200 kilometers, then back into Mongolia where the duration of totality is 2m 11s and 200 kilometers later it makes its final crossing back into China, where the duration is marginally above two minutes with a duration of 2m 02s.

Map modified from an original by Xavier M. Jubier and Google Maps



# Hami Prefecture

## Weather:

As Mongolia juts out across the path, the conditions improve to a respectable 30 to 40 percent, and in a small isolated region just east of Hami (but along the centerline), the conditions change to a possible 20 percent chance of clouds. A majority of tour groups will converge on this area for that very reason. The path here is at or below two minutes, but two minutes of eclipse is better than 2m 27s under clouds. Of course, nothing is a sure thing, which is what makes eclipse chasing a crapshoot no matter where you are. The area east of Hami Prefecture, on the eastern side of the Xinjiang Nygua Mountains, is considered the primo area

Along the eastern part of the Xinjaug Uygur Autonomous Region, we find Hami Prefecture with a population of 400,000. Hami itself, with over 300,000 people, lays both inside and outside the dividing line between totality and partiality, and eclipse chasers that desire grazing eclipse events will find staying in town their best vantage point. Here Bailey's Beads will be numerous along the limb of the Sun.

Some tour groups will overnight in Hami for one or more nights, with a visit to the centerline on eclipse day. Other groups plan to have special camps set up near the centerline, making a very convenient location for the serious eclipse chaser, and allowing the entire day to set up for the afternoon eclipse, and plenty of time to pack the equipment away. This region is also known for their produce, and is famous for the sweet varieties of Hami grown melons which they have grown here for millennia. By eclipse the melons should be in ample supply. The remains of some 20 ancient beacon towers are found in the area, standing 5 to 10 meters high. These were military inspection stations that lined the silk road between the Tang and Qing Dynasties.

To learn much more about Hami and its history, visit the web site at;

<http://www.silkroadcn.com/xinjiang/hami.htm>

## Central China and Xi'an

### Weather:

The weather after the Hami region stays very good for some time as the path continues southeast, with a 30 to 40 percent region for a few hundred kilometers. Unfortunately, the conditions worsen as the path approaches Xi'an area, where weather conditions give a 50-50 chance that clouds could be visible. This however is what the chances were in Turkey near the coast for the 2006 eclipse.

Totality cuts into the Gobi Desert near Wuwei, and 1m 37s is visible from town, and 40 kilometers to the northwest the central path will experience 1m 44s of totality. Xi'an is a location to note for travelers. It is a city of over 2½ million people, and it lies on the southern edge of the path of totality. Xi'an's claim to fame is [at least one of] the eighth wonder of the world, is the Terra Cotta Warriors. Discovered in 1974 while drilling a well, the tomb of the 1<sup>st</sup> emperor of China, Qin Shi Huang, was discovered. Over 8000 full size warriors and horses built of Terra Cotta (ceramic) in 3 separate pits have been unearthed and many have been pieced back together. Also bronze chariots, horses and a driver were also discovered. Now all reside in the museum and it has been declared a UNESCO World Heritage site. Just 105 kilometers to the northeast of Xi'an, 1m 34s of totality will be possible if skies allow.

A half minute later, totality leaves the Earth's surface as the Sun sets with 1m 28s of totality possible just before it drops below the horizon, and only 700 kilometers shy of making it to Shanghai. Those in Shanghai do not have to wait long to be vindicated from the absence of the Sun from this eclipse since on 2009 July 22, totality will pass directly over Shanghai, one of the largest cities in the world. Look for our article on this in an upcoming issue, hopefully before this year is out.

All eclipse chasers, and veteran eclipse chasers need to go on an eclipse trip with a frame of mind that they are going on a great sightseeing trip, and if clear skies are available for the eclipse, you came out with an added bonus, but either way, you will still be experiencing something special to remember.

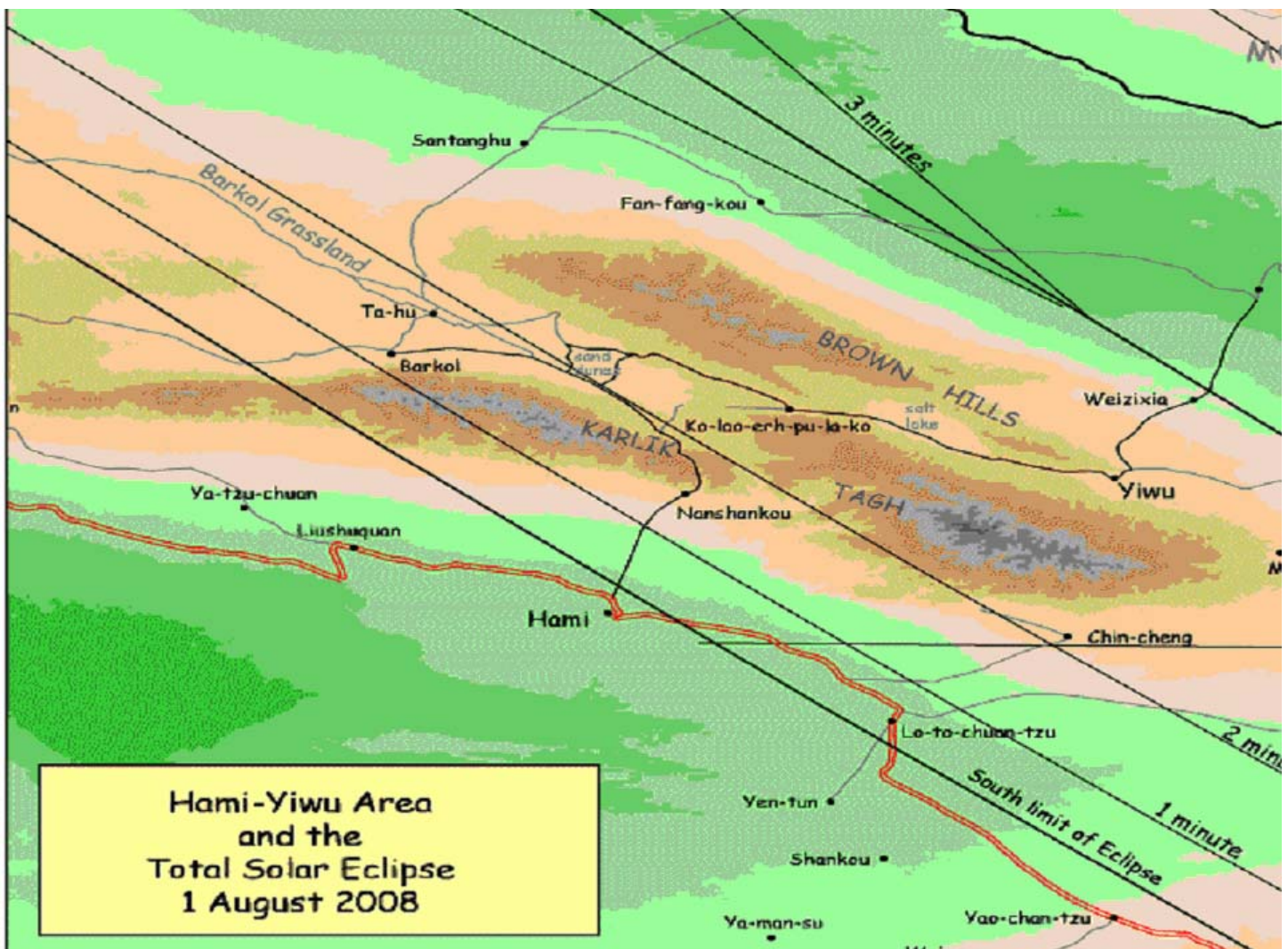
On Jay's web site, he gives an account of a trip he and Aram Kaprielian of TravelQuest International took, for a weather and site planning trip in July and August of 2006, and their report is detailed to the location near Hami, China, along with information on the weather, the terrain, and the roads, along with photographs of the area. You should read this so you can best be informed. It is always best to be an informed observer and traveler. Vist this and other features on his web site. The direct link to the 2008 planning trip can be found at; <http://home.cc.umanitoba.ca/%7Ejander/tot2008/survey08a.htm>

# Site Survey for the 2008 Total Eclipse: China & Russia

by Jay Anderson and Aram Kaprielian

During July and August 2006, Aram Kaprielian ([TravelQuest](#)) and I travelled through Central and Northern China, and Siberian Russia to inspect possible eclipse viewing sites and observe typical weather patterns along the eclipse track. The five-week trip was a great success, providing valuable insights into both the weather and terrain.

In China, our major goal was Hami, where climatological statistics promise the greatest probability of clear skies. Hami is a modern city of some 700,000 people lying on the flat dry plains on the west side of the Karlik Tagh, a minor branch of the Tien Shan (mountains). From the city, the mountains are a prominent part of the eastern horizon, snow-capped and rugged, with peaks reaching as high as 4000 m ASL. Hami lies just outside the zone of totality; its eastern suburbs touch the "south" limit of the track. Most eclipse-chasers will choose to travel from Hami into the mountains, to observe along the centre-line close to the town of Yiwu.



Weather prospects near Hami are the best anywhere along the track, promising 76% of the maximum possible sunshine in the month of August. However, it was apparent from our first view of the mountains that the cloud cover over the peaks was higher than that over the city, and the climate statistics for the Hami weather station probably do not fully represent the conditions in the mountains. In the morning, the cloud cover could be seen as a stratus layer lying close to the higher peaks, but as the day warmed, it became more convective, increasing in amount, growing vertically, and moving downwind with the upper level westerlies. Hami is usually not affected by the cloud on the peaks, as the prevailing winds blow from the west (as they do in all similar latitudes in the northern hemisphere). From Hami, the peaks often look very cloudy, but the centre line of the shadow track is actually on the other side of the Karlik Tagh and first impressions from Hami can be very misleading.



**Figure 1:** An ancient Silk Road watchtower long the highway east of Hami. In the background is the Karlik Tagh, topped with cumulus clouds. The highest peaks are out of the image to the right (south).



**Figure 2:** Looking back toward Hami from the foothills of the Karlik Shan. The south limit of the eclipse shadow lies in the distance, at the edge of the city. Eclipse duration is about 1 minute at this location.

The road into the mountains from Hami is an excellent two-lane paved highway all the way to Yiwu. The first 40 kilometres traverses flat gravelly plains devoid of any vegetation save small pads of tough grass. Along the way, we passed an ancient Silk Road watchtower standing lonely guard over the arid plains. Shortly thereafter the highway reached the foot of the mountains (43.076N, 93.692E), entering a gently sloping gorge bordered by barren rocky hills. Within a few kilometres, the gorge closes in on both sides, and the winding highway enters the first of a series of switchbacks and narrow openings that steadily ascend the mountain slopes. A rushing stream now shares the route in uneasy cooperation with the road. The barren rocky slopes of the lower altitudes gradually acquire a thin green haze of vegetation as the road ascends; shrubs appear along the stream, and then small groves of trees. The road grows more tortuous, at times barely fitting between the mountain walls as it zigzags back-and-forth across the stream on solid-looking bridges.



The switchbacks are not continuous, but straighten now and then as the gorge opens to tiny roadside meadows with small homesteads. Tough-looking sheep barely acknowledge our passing. When opportunity permits, we pull off from the road to photograph the marvelous scenes behind and ahead. As we climb higher, the tiny roadside meadows become more frequent, and eventually pines appear, adding a fresh and invigorating scent to the now-cool air. Small communities of log homes and canvas gers (yurts) dot the spreading hillsides, and roaming goats and sheep, interspersed with an occasional milk cow, watch as we pass. After about 40 km and 2000 m of climbing, the road flattens and the pass gradually opens to the sky. After another dozen kilometres, we are ushered onto the Barkol Grasslands. We have passed through the Karlik Tagh and a new world presents itself for our examination.

The grasslands occupy the ground between the Karlik Tagh and the Mongolian border some 130 km distant. From our initial vantage point, flat rolling hills of lush grass and small pine forests stretch off to the east. Occasional grain fields and yellow canola

flowers testify to more serious agriculture, and the contrast with the dry hot desert at Hami is startling and very welcome. The Karliks, now behind us, are even more spectacular in the clear air of the grasslands — the snowcapped peaks are now seen to be home to marvelous hanging glaciers. The road turns south toward Yiwu, now a straight and level asphalt highway with little traffic save a few trucks. As we proceed southward, we gradually realize that we are being sandwiched between the Karliks and a small line of hills building on our left side. The hills gradually acquire a more mountainous-looking roughness, but we are never sure that they should be dignified with the name "mountain."



**Figure 4:** The gorge narrows as the road climbs to higher altitudes. The total climb from Hami to the top of the pass is about 2000 m.



**Figure 5:** At higher elevations, the pass opens to reveal small farm communities, some hugging the highway in narrow spaces along the gorge, and others, such as this, expanding across a more accommodating terrain.





**Figure 6:** The first view of the Barkol Grasslands. This view, just past the top of the pass, looks eastward toward Mongolia. The air is cool and refreshing and the sky has lost most of the desert haze that hangs in Hami's atmosphere

As we continue onward, an unexpected pocket of tall sand dunes appears on the left. Only 5 km in length and a short distance from the road, it invites exploration, but we proceed with regrets. There will be a great temptation to stop here on eclipse day. The plateau is a magical area that demands frequent stops for photography. Even though we had done extensive exploring with *Google Earth*, the on-the-ground reality is surprising, and a very pleasant one at that.



**Figure 7:** A view eastward across the grassland. In the middle distance is a small area of sand dunes, while in the distance, low brown hills capped with scattered cumulus clouds marks the approximate location of the centre line. This photograph is looking in the opposite direction to the image on the right and was taken in the late morning.

As we continue on our journey, the brown hills gradually squeeze upon the road on the east, while the looming Karliks in the west provide us with stunning views of their necklaces of glaciers. This is definitely the place to stop for photographs, though Yiwu is close at hand, lying under this world-class scenery.



**Figure 8:** This view shows the 4000-m snow-capped peaks and hanging glaciers of the Karlik Tagh, looking westward from the Barkol grassland, from a point just north of Yiwu. It is taken in the late afternoon when cloud cover on the peaks has increased significantly from its morning minimum. Some of this cloud has moved over the plateau where it gradually dissipates. Because some of these clouds have grown deep enough to rain,

Yiwu, in contrast to our expectations, turns out to be a modern town of bright yellow and pink apartments, wide treed boulevards, and modern-looking stores and facilities. The main street is a serene and pleasing place, with flower-fringed medians and ambling pedestrians. There is at least one comfortable hotel, which possesses several large petrified trees, one erected in its front garden, and two other lying prone along the main building. One has a diameter of nearly a metre on the wide end and a length of perhaps 30 m. Yiwu (43.250N, 94.695E) is somewhat west of the centre line, but offers a comfortable environment in which to view the eclipse. The penalty is small — a loss of three seconds in the duration of totality — and it seems likely that many will elect to stop here instead of going onward to the middle of the track. The venue is somewhat crowded in the sense that the hills that mark the eastern edge of the Barkol grassland have converged with the Karliks and Yiwu is situated at the apex of this convergence — at the bottom of a topographical funnel it would seem. The southern part of the town has buildings that butt up against the brown hills, but there is plenty of space elsewhere in the northern parts of the town to fit a sizable group of eclipse-chasers.

The venue is magnificent. On August 1, 2008, observers will have the eclipsed Sun about 45 degrees to the right of the glacier-bejewelled slopes of the highest peaks of the

Karliks, surely one of the most spectacular venues for photography since the Bolivian eclipse of 1994.



**Figure 9:** Central Yiwu, looking southward. The hills in the background are an extension of those seen in the distance in Figure 7 above ("the brown hills"). These hills later developed a more extensive cumulus cloud cover.



**Figure 10:** Central Yiwu, looking northward. In the distance are the peaks of the Karlick Tagh with a growing cap of convective clouds. This scene is taken in early afternoon; several hours later the cloudiness had expanded to the extent seen in Figure 8. Clouds of this dimension seen in this image would likely dissipate during the eclipse as temperatures fall.

### East to the Centre Line

The road to the centre line, an additional 36 km on the highway, departs Yiwu to the south, brushing up against the eastern hills (Figure 9), but shortly out of the community, turns northeastward toward the Mongolian border. The hills, though tiny in size compared to the majestic Karliks behind us, force the highway into occasional switchback turns and narrow gorges, but the route is mostly flat with plenty of open

places. We follow a small river. There are small fields wherever the hills open, with irrigation ditches and small groves of trees to interest the passer-by. Though paved, the quality of the road declines a little after Yiwu, with small broken parts in the pavement and occasional narrow bridges. Farther on we exit the range of hills into a flatter area and come upon the tiny community of Weizixia (43.458N 94.839E). It is a hardscrabble village, brightened by garden foliage in every family compound and rows of tall trees, but little in the way of agriculture in the immediate vicinity.

Beyond Weizixia, we enter yet another range of hills, and once again, the road is confined by gentle hills that block the distant view. The sky overhead is open except for occasional trees, and there are accessible fields beyond the ditches. It is an easy spot to watch the eclipse, though the approach and departure of the shadow would suffer somewhat. The biggest problem seems to be that there is no usable open place - flat areas are taken up with crops and the river complicates access to other parts of the scene. Nevertheless, we mark the centre line with red paint — a dab on the shoulder of the highway and a dab on a convenient electrical pole on the west side of the road.



**Figure 11:** The centreline, in the hills east of Yiwu. The photo was taken in mid-afternoon on July 28, 2006. Cumulus clouds in the distance grew somewhat thicker during the afternoon, but were never large enough to constitute a problem had the eclipse occurred this day. The wide-angle lense "expands" the scene, giving the impression that there is more space in the roadside fields than is actually the case.

Our maps indicate that the line of hills that surround us should come to an end a short distance to the east, and so we continue in that direction in search of a more open space. After a few kilometres we exit onto a flat open plain that stretches — with the road — toward the village of Nom and the distant Mongolian border. The plain (Figure 13) is nearly devoid of vegetation, and consists only of sand and stones — sharp, ugly, hand-sized grey stones (scree from the hills behind us) but the site offers an open horizon to the north, east and south and plenty of room for any sized group. On the north side of

the road, our now-sizeable river limits exploration in that direction and provides the only greenery in the scene. We travel five or eight kilometres in this direction, hoping for a more attractive landscape, but eventually realize that the unforgiving ground probably stretches to Mongolia. By now we are a considerable distance from the centreline, and observation from this flat landscape would bring too much of a time penalty when compared to Yiwu behind us.

On our return to Yiwu, we stop in at Weizixia (Figure 14) to scout the village. The time penalty here is about a second, but the village has no amenities to offer. It lies on a sand-and-stone plain that affords a decent view all around, though all horizons but the north are eventually blocked by the terrain.

### **What We Saw of the Weather**

Mountains make cloud, at least on their upwind side and peaks, and are to be used with caution for eclipse

sites. During our three days in Hami, we were treated to three separate cloud menus. On the day that we arrived, a large weather system brought overcast skies to much of northern China. Eclipse viewing would have been impossible or severely limited at any site, mountain or desert. The cloud over the flat plains surrounding and south of Hami was at mid and high levels and almost overcast. Over the mountains or at least the western side that we could see, precipitation was falling. This observation serves to emphasize that whatever cloud is in the neighbourhood, it will be nearly always be heavier over the Karliks because of the cooling of the air as it rises to flow over the peaks. Unfortunately, we could not tell what the cloud cover was like on the central line, as that region is hidden for an observer watching from Hami. Theoretically, the cloud cover should have thinned and possibly evaporated as the air descended the east side of the mountains onto the Barkol grassland, but the strength of the upper level disturbance (the strongest that we experienced in our ten days in northern China) suggests that that was probably not the case. Thinner, yes, but not gone.

Our second day, the day of our expedition to the grassland, dawned bright and clear in Hami. The Karlik peaks were partly cloudy — the kind of stratus-y stuff that hugs the shoulders of the higher pinnacles — but it was pretty firmly attached and didn't seem to be blowing off toward the centre line on the far side of the range, at least from our distant viewing site. There wasn't much of it - just a few of the higher peaks and nearby slopes were clouded over. The stratus didn't last very long, for the rising Sun soon had it building into cumulus (Figure 1) and towering cumulus — clouds that drifted off of the mountain slopes and onto the Barkol grassland toward the middle of the shadow track.

On arrival at the grassland plateau, we found that the cloud was primarily on the biggest peaks (toward Yiwu) and that it dissipated quickly as it left the higher ground and flowed downhill (Figure 10). The altitude drop from the peaks to the plateau is around 2000 m,



**Figure 12:** A view of the scene near the centreline, looking toward the highway from the fields on the north side. This view gives a better idea of the space available for viewing and the topographical constraints. The water in the foreground is part of an irrigation system that diverts the flow of a large stream immediately behind the photographer. This vantage point is just off the right side of Figure 11.

a pretty substantial distance and one capable of wringing a considerable humidity out of the air. For the most part, in our travel south to Yiwu, we were in sunny skies with hardly a cloud between us and the Sun. As we approached Yiwu however, the combination of a later hour (mid-afternoon, when temperatures reach their peak), and



**Figure 13:** The view from the gravel outwash plains east of the centreline. The view here is toward the west: in the distance, the brown hills that contain the centreline can be seen. The cumulus clouds on the top of these hills show the influence of higher terrain on the production of cloud. In the far distance on the left, the cloud cover on the Karliks can be seen. The surface is a gravel-and-sand mixture that would provide a solid surface for any mounting.

the encroaching mountains allowed some of the larger cumuli to reach us. Of slight concern was the development of small cumulus clouds on the lower range of hills east of the Karliks — the ones along the centre line (Figures 11, 12, and 13). The cumulus clouds covered about 40% of the sky during their peak, but fortunately, this type of cloud will dissipate quickly in the falling temperatures as the lunar shadow approaches. Eclipse cooling will also have an effect on the deeper convective clouds on the Karliks, but will not cause them to dissipate

completely. On the Karliks, the cloud continued to develop through the afternoon and became quite heavy (Figure 8) as we left Yiwu and headed home about 4 pm. We encountered a small thunderstorm north of Yiwu in the return to Hami, but even this only managed a desultory drop or two on our windscreen. While the area north of Yiwu was covered by about 7/10ths cloud cover, there was plenty of clear sky to the north and the east. Only the highway near the highest peaks was affected by the broken cloudiness.

On our third day — the day we departed northward — the mountains dawned almost without cloud and only a few timid cumulus crowned the higher peaks as the day warmed. Our journey northward toward Urumqi allowed us to observe that there is a very tight relationship between the development of convective cloud and the height of the terrain. Cloud could be seen only on the highest parts of the mountain chain and sections even a thousand metres lower were bathed in continuous sunshine.

## Eclipse-Day Strategies in the Hami Area



**Figure 14:** A view of Weizixia, looking southward from the north side of the community. The view to the north (behind the photographer) is of the open plains of the grassland (not so grassy this far south). While no clouds are visible over the brown hills from this perspective, clouds that had developed over the Karliks were thickening behind the photographer.

Hami — if weather follows its most common pattern — is likely to greet eclipse day with clear skies, and remain clear for the day. The slopes of the Karlik, easily visible from the city, may have a quite different cloudiness, ranging from a nearly overcast sky, to a sky that is as clear as that at Hami. Here are a few ideas to consider:

1. If the weather on the Karlik Tagh is clear or has only scattered cumulus clouds by noon, go up to the grassland.

It's a big area, and the whole thing is within the Moon's shadow. If the mountains develop a broken cloud cover by mid afternoon, and the cloud is not too deep (i.e. there is no rain falling), then it will probably disappear by eclipse time. Keep an eye on the east slopes of the Karliks above Yiwu, as cloud may continue to build there through the afternoon, until a little after first contact. If it looks more threatening than you care to tolerate, retreat northwestward along the highway, back toward the pass that brought you onto the grassland. The mountains to the north (toward the sand dunes and the salt lake) are much lower than those near Yiwu, and will have less cloud to drift onto the eclipse track. You will lose some time, but probably no more than about 20 seconds. Watch the motion of clouds blowing toward the centre line from the mountain slopes: do they dissipate quickly on leaving the slopes or drift leisurely eastward without much change? Keep an eye on the drift of these clouds and the winds aloft — that will help you to judge the prospects of alternative sites.

2. If the mountain peaks seen from Hami are embedded in cloud, (but Hami itself is clear) then there is little alternative but to send someone to go and look at conditions on the other side of the Karliks before making a decision about going to the Yiwu area or somewhere else. It is a three-hour trip to Yiwu, but a scouting expedition need only go as far as the grasslands (about an hour) and report back on conditions on the plateau. Cell phone and Blackberry coverage is excellent (as it was everywhere in China and Russia), and there should be no problem passing word back to those lower down. If the view to the south looks ominous (I'd advise going as far as the sand dunes, where the road turns toward Yiwu), then check out the situation in the other direction, toward Barkol. While Barkol is much farther from the centre line than Yiwu, there are roads in the area that head east toward the middle of the eclipse track, though they may not be in such good condition as those to the south.

If the conditions on the plateau do not look promising, then the "last resort" eclipse site is at the foot of the Karlik Tagh, just as the highway enters the gorge that goes up to the plateau. The eclipse duration here is a little over 1 minute. If your expedition leaves early for the plateau (before 11 am?), it should have time to reach the top, check out the cloud cover, and return to the desert floor if the situation looks desperate. Be careful about being too pessimistic — the downslope winds and the eclipse cooling will be powerful forces in dissipating any convective clouds.

3. If everything is clouded over — Hami, the Karliks, and all around — then bite the bullet and go up onto the plateau. The incoming weather system has to rise up over the mountain peaks and descend onto Barkol Grassland and the descent may open holes in the cloud cover that make a view of the eclipse possible. Make sure that clearing skies aren't coming in from the west before you do: that's what satellite pictures are for, though this part of the world is very poorly provided with decent imagery. You don't want to head for the grassland and then find out that it cleared at Hami just in time for the eclipse. In this situation, you have nothing to lose and everything to gain.

- Jay Anderson and Aram Kaprielian ([TravelQuest](#))



## Tour Groups

As with every tour, different groups are available to select from. Many of the groups listed in our guide are groups that specialize in eclipse and astronomical tours. Others specialize in tours of the region the eclipse occurs in. The latter usually are not keen on the concerns of the serious eclipse chaser. You may need to convince your guide that eclipse day should be just for that, with no side tours. It is important to have a lot of time to set up and align your equipment, with plenty of time to spare.

Likely more tours will become available. The listings that we include here are ones that were found by a Google search on the web. 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, so the more countries, the more fees, and these are usually not included in your basic tour price.

China is a large country, and there are a lot of great scenic locations to visit. Just plan on coming back again to see those you couldn't see on this trip. You don't have to wait long, for slightly less than one year later, on 2009 July 22, another total solar eclipse returns to the region. This will be highlighted in an issue that will be posted in a issue coming yet this year.

Trips are available from such unique tours as a flight over Greenland and the North Pole and an icebreaker and helicopter flights to the North Pole and Novaya Zemlya, to train trips across Siberia, and hiking trips in Mongolia, over-nighting in Ger Camps, and visiting historical sights in China such as the Great Wall and the Terra Cotta Warriors, even with the short tours and fly-ins, there should be something available for everyone.

# Now Booking; 2008 Total Solar Eclipse

Here we are, 1½ years before the 2008 eclipse, and the travel groups are starting to pop up all over the place and still more to come! I encourage you to check the web sites of these groups to find the trip that best fits your needs and price ranges. Here are several groups that I was able to find on the web, and their starting prices for each trip and in the funds specified for their originating country

## **2008 Eclipse** All Travel groups are listed in alphabetical order

### **Ancient World Tours (UK)**

Russian Eclipse Tour A > 9-day trip

JUL 26 to AUG 03

2495 GBP

Russian Eclipse Tour B > 10-day trip

JUL 26 to AUG 04

2995 GBP

Russian Eclipse Tour C > 9-day trip

JUL 30 to AUG 03

1335 GBP

China Eclipse Tour A > 12-day trip

JUL 26 to AUG 06

2495 GBP

China Eclipse Tour B > 9-day trip

JUL 27 to AUG 04

2295 GBP

China Eclipse Tour C > 9-day trip

JUL 27 to AUG 04

2235 GBP

China Eclipse Tour D > 11-day trip

JUL 26 to AUG 05

2395 GBP

<http://www.ancient.co.uk/default.aspx?Page=astro2008>

### **Boojum Expeditions**

Mongolia / Gobi Desert & Lake Khovsgol > 7-day trip

JUL29 to AUG 04

\$2600 USD > 3 different extensions are available

<http://www.boojum.com/extras/eclipse2008.pdf>

### **Civilized Adventures (CAN)** thru the Calgary Center of the RASC

Silk Road Eclipse Quest > 16 day trip > TOTALITY from Hami & Yiwu

JUL 24 to AUG 08

\$4699 CAD

<http://www.civilizedadv.com/PDF/CH230708.pdf>

## **Eclipse City**

Russia > 36 hour trip - Includes Airfare from FRA (Frankfurt , Germany)

JUL 31 to AUG 02 > 2m 20s TOTALITY (Novosibirsk)

1290 Euros

<http://www.eclipse-city.com/start.php?navId=1&subNav=1&thirdNav=4>

China > 72 hour trip - Includes Airfare from FRA (Frankfurt , Germany) or LAX (Los Angeles, USA)

JUL 31 to AUG 02 > 1m 50s TOTALITY (NE of Jiayuguan)

1790 Euros (\$2400 USD)

<http://www.eclipse-city.com/start.php?navId=1&subNav=1&thirdNav=3>

China > 9 day trip - Program 1A – ex. Urumqi (China)

JUL 26 to AUG 03 > 2m 00s+ TOTALITY (Barkol)

1990 Euro (\$2700 USD)

<http://www.eclipse-city.com/start.php?navId=1&subNav=1&thirdNav=1#1>

China > 11 day trip - Program 1B – ex. Beijing (China)

JUL 24 to AUG 03 > 2m 00s+ TOTALITY (Barkol)

2950 Euro (\$3950 USD)

<http://www.eclipse-city.com/start.php?navId=1&subNav=1&thirdNav=1#2>

China > 9 day trip - Program 1C – ex. Shanghai or Beijing (China)

JUL 26 to AUG 03 > 2m 00s+ TOTALITY (Barkol)

2490 Euro (\$3350 USD)

<http://www.eclipse-city.com/start.php?navId=1&subNav=1&thirdNav=1#3>

China > 9 day trip - Program 2 – ex. Beijing (China)

JUL 25 to AUG 02 > 1m 50s TOTALITY (Gobi Desert – NE of Jiayuguan)

2490 Euro (\$3350 USD)

<http://www.eclipse-city.com/start.php?navId=1&subNav=1&thirdNav=2>

## **EWP**

Russia / Altai Program > 15-day trip > - 2m 20s TOTALITY south of Barnaul

JUL 21 to AUG 04

3000 Euro

<http://www.ewpnet.com/russia/altaieclipse.htm>

Mongolia / Gobi Desert (camping trip) >12-day trip

JUL 25 to AUG 05 - 2m 03s TOTALITY

2650 Euro from Ulaan Baatar

<http://www.ewpnet.com/mongolia/gobieclipse.htm>

## **Jasmine's China Adventure Tours**

<http://www.jasminechina.com/ecl2008.htm>

Eclipse Only > 7-day trip

JUL 28 to AUG 03

\$2650 USD

Eclipse Over the Silk Road > 16 day trip

JUL 19 to AUG 03

\$3995 USD

## **Journey's International**

Mongolia Solar Eclipse > 15-day trip

JUL 25 to AUG 08

\$4175 USD or less > 2m 13s TOTALITY from Hovd camp

<http://www.journeys-intl.com/destinations/asia/mongolia/651/>

China Solar Eclipse > 14-day trip

JUL 22 to AUG 04

TDB expected around \$3500 USD

<http://www.journeys-intl.com/destinations/asia/china/606/>

## **LexCorp Cruise & Tour Marketing**

2008 Total Solar Eclipse and Three Capitals of Russia > 9-day trip **NEW LISTING!**

JUL 25 to AUG 02

\$3850 USD > Novosibirsk

[http://www.cruisemarket.com/solar\\_eclipse\\_tour.html](http://www.cruisemarket.com/solar_eclipse_tour.html)

## **Mongolia Expeditions**

2008 Total Solar Eclipse in Mongolia > 8-day trip **NEW LISTING!**

JUL 29 to AUG 05

\$2486 USD > Western Mongolia – 2m 07s TOTALITY

<http://www.mongolia-expeditions.com/solar-eclipse-special-tours.htm>

## **MWT Associates**

Siberian Total Solar Eclipse & Grand Waterways of the Czars – 16 day trip - viewing from Novosibirsk

JUL 18 to AUG 2, 2008

\$6325 to \$10,325 USD (\$6795 to \$9975 for deposits received by May 1, 2007)

Request a brochure to receive a price list

**DOES include round trip airfare from JFK**

<http://www.melitatrips.com/siberia/index.html>

Siberia Total Eclipse and Baltic Voyage - 12 day trip – viewing from Novosibirsk **NEW LISTING!**

JUL 28 to AUG 09, 2008

Request a brochure to receive a price list

[http://www.melitatrips.com/siberia\\_baltic/index.html](http://www.melitatrips.com/siberia_baltic/index.html)

## **On The Go COMING SOON!**

<http://www.russiaonthego.com/Russia-Solar-eclipse>

## **Ring of Fire Expeditions - Winco Travel**

Total Solar Eclipse in China – 7day trip – 3 viewing sites, 1m 50s to 2m 00s at 2 sites, and 0m 30s at Hami

JUL 27 to AUG 3, 2008

From \$2999 USD with extensions for Beijing, Tibet and the 2008 Olympics (coming soon)

4 Groups of up to 20 individuals each are scheduled

<http://www.eclipsetours.com/china.html>

## **Selena Travel**

2008 Solar Eclipse in Mongolia – 8 day trip – viewing from Novosibirsk **NEW LISTING!**

JUL 30 to AUG 06, 2008

\$1115 to \$1425 USD

[http://www.selenatravel.com/tours/mongolia/2008\\_total\\_solar\\_eclipse\\_tour.html](http://www.selenatravel.com/tours/mongolia/2008_total_solar_eclipse_tour.html)

## **Sirius Travel**

Mongolia – 10 day trip – 2m 09s TOTALITY

JUL 26 to AUG 4, 2008

\$4150 USD

Also does not include Emergency Evacuation Insurance which is REQUIRED

<http://www.siriustravel.com/mongolia08/index.cfm>

## **Spears Travel by Carlson Wagonlit**

Northern China 2008 > 10-day trip

JUL 26 to AUG 04 > 1m 54s TOTALITY 100 miles from Hami

\$3935 USD

<http://www.spearstravel.com/astronomy/china08/china08itin.htm>

## **TravelQuest International**

China's Silk Road TSE Aboard the China Orient Express – 12 day trip

JUL 25 to AUG 5, 2008 and JUL 27 to AUG 7, 2008

**The JUL 25 package of these 2 “reverse” direction trips, is SOLD OUT!**

\$5290 USD per person double occupancy

<http://www.tq-international.com/ChinaOrientEx08/ChinaOrtExIntinerary.htm>

Hami, China TSE – 7 day trip

JUL 29 to AUG 3, 2008

\$2890 USD per person double occupancy

<http://www.tq-international.com/China08Hami/ChinaHami.htm>

Grand Passage Through Siberia, Russia aboard the Trans-Siberian Express – 15 day trip

JUL 27 to AUG 10 - Moscow to Vladivostok

\$8995 USD to \$13,895

<http://www.tq-international.com/Russia08GrandPass/RussiaGPitinerary.htm>

Great Cities of Russia – 11 day trip

JUL 26 to AUG 5, 2008

\$5690 USD

<http://www.tq-international.com/Russia08NoTrain/RussiaGCNTitinerary.htm>

Great Cities of Russia aboard the Trans-Siberian Express– 13 day trip

JUL 26 to AUG 5, 2008

\$7995 USD to \$8945 USD

<http://www.tq-international.com/Russia08GreatCities/RussiaGCitinerary.htm>

Novosibirsk Fly-in – 4 day trip

JUL 30 to AUG 2, 2008 from Moscow

\$2695 USD

<http://www.tq-international.com/Russia08Flyin/RussiaFlyinitinerary.htm>

North Pole Voyage to Totality – 17 day trip

JUL 19 to AUG 4, 2008 from Moscow

\$22,900 USD to \$29,900 USD **(\$29,900 package is SOLD OUT!)**

<http://www.tq-international.com/NorthPole2008/NPhome.htm>

North Pole Voyage to Totality – 2 day trip

JUL 31 to AUG 1, 2008

\$8880 USD to \$13,380 USD per row from Düsseldorf, Germany and Köln/Bonn

<http://www.tq-international.com/NorthPoleFlight2008/NPFlighthome.htm>

Additional Info on the Polar Eclipse flight of 2008 from Glenn Schneider

[http://nicmosis.as.arizona.edu:8000/ECLIPSE\\_WEB/ECLIPSE\\_08/TSE2008\\_EFLIGHT.html](http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_08/TSE2008_EFLIGHT.html)

## **Tropical Sails Corp**

China > 10-day trip

JUL 25 to AUG 04 > 2m 00s TOTALITY (near Hami)

\$2288 USD

<http://www.tropicalsails.com/china.pdf>

## **Tusker Trail**

Mongolia >13-day trip

JUL 26 to AUG 06 - 2m 03 TOTALITY

\$4380 USD > Gobi Desert Extension Available, AUG 06 to AUG 10 for \$1915 USD

<http://www.tusker.com/eclipse2008/1eclipse.htm>

## **Wilderness Travel**

<http://www.wildernesstravel.com/itins/evmongol.html#brief>

Total Solar Eclipse in Mongolia > 7-day trip

JUL 27 to AUG 02 > 2m 05s TOTALITY at 6700 feet altitude

Mongolia Eclipse Camp

JUL 27 to AUG 02

**SOLD OUT!**

Lake Hovsgol & Eclipse > 11-day trip

JUL 27 to AUG 06

\$4995 USD

The Gobi Desert & Eclipse > 13-day trip

JUL 27 to AUG 08

\$5195 USD

Altai Mountains Trek & Eclipse > 14-day trip

JUL 27 to AUG 09

\$5595 USD

Heart of Mongolia & Eclipse > 16-day trip

JUL 27 to AUG 11

\$5295 USD

Lake Baikal & Eclipse > 15-day trip

JUL 27 to AUG 10

\$6995 USD

## Also Now Booking; 2009 Total Solar Eclipse

This eclipse may be the biggest eclipse event of the century as it will be the longest totality of the century. The longest it can possibly last is 6m 38.9s in an area of ocean where little land exists. There are a few tour groups booking some locations already, with more to come. So far I have only found a couple that are already taking reservations, and they are on mainland China, where the longest available time will be 5m 54s southwest of Shanghai. In a future issue we will look at this specific eclipse and the weather expectations. The following groups are listed as they have posted their itinerates;

### **Jasmine's China Adventure Tours**

“Eclipse Only” Tour of Shanghai > 6-day trip

JUL 19 to JUL 23 > 1 pre-eclipse and 3 post-eclipse extensions are also available

Price TBD Summer of 2007

<http://www.jasminechina.com/ecl2009.htm>

### **Sirius Travel**

Tibet & China – 18 day trip – 5m 00s TOTALITY at 3099 meters on Mt. Emei Shan

JUL 13 to JUL 30, 2009

\$4325 USD

<http://www.siriustravel.com/tibet09/itinerary.cfm>

### **Tropical Sails Corp**

Eclipse 2009 China Total Solar > 14-day trip

JUL 11 to JUL 24 > nearly 6m TOTALITY (near Shanghai)

\$2798 USD

<http://www.tropicalsails.com/eclipse/page3.html>

## **DISCLAIMER & ADVICE**

At **TOTALITY!**, we have done a 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 connivance and to be a reference for your further examination to find the package that best fits your needs. 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 these 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 a ATM withdrawal abroad.

Additional trip extensions are also often available. More listings will be added when they become available and be indicated by a **NEW LISTING!** on the listing indication.

The 2008 TSE in China occurs only a week before the start of the 2008 Summer Olympics in Beijing, and likely the sooner you book your flights to and from China, the more you will save, and also be likely to have a flight available.

## Eclipse Specialty Tour Group Web Sites . . .

**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 Solar Eclipse Tours**

<http://www.eclipsetours.net/>

**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>

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## Other Useful Eclipse Web Sites . . .

NASA Eclipse Home Page

<http://sunearth.gsfc.nasa.gov/eclipse/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](http://xjubier.free.fr/en/site_pages/SolarEclipsesGoogleMaps.html)

IAU Solar Eclipse Working Group

<http://www.williams.edu/Astronomy/eclipses/>

Sheridan Williams Web Site

<http://www.clock-tower.com/>

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Resolution of this document: This document was originally created as a Word document, and it's 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. If you want to make decent quality prints from this document, and you have a PC or can read a Word document, you may wish to request the original document from me, I will be glad to send it to you. The Word document however is nearly 10x larger than the Acrobat document.

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](mailto:TOTALITYnewzine@aol.com).

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

### **In the Next Issue;**

- **Five Millennium Google Enabled Solar Eclipse Maps**

### **In Future Issues;**

- **2009 Total Solar Eclipse - Longest Eclipse of the 21<sup>st</sup> Century**
- **2010 July 11 - Remote Island in the Path; Rapa Nui**
- **Return of the Solar Eclipse Path to the U.S.**
- **Total & Annular Solar Eclipse Maps 2001 to 2050**
- **Eclipses of the Past >**  
**1984 - The "Broken Ring" Eclipse / 1991 - The "Great" Eclipse**
- **Eclipse Chaser Profile**

