TOTAL ECLIPSE OF THE ~~HEART~~ SUN

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Travelling east at a rate of 1,700km/h the moon's shadow will turn the mid-morning sky to an eerie twilight on Wednesday, 22 July. The umbra will cross 11 provinces, completely blotting out the sun for over six minutes in many major cities, including Shanghai. This total solar eclipse is the longest of the 21st century, and for China, the longest in 500 years.

In bygone days, this hair-raising event would have throngs of Chinese people banging gongs and pots and drums in the streets, trying to ward off celestial dragons believed to be eating the sun. Times have changed. This once-dreaded, inauspicious event is now big business, as globe-trotting eclipse-chasers flood into the country, snapping up those hotel deals and tours you've been eying for yourself.

The age of jets is the age of ecliptomaniacs. We tracked down two of them, to find out just how far they'll go to get a glimpse of that black whole sun, and more importantly, why.

PROFILE OF AN UMBRAPHILE

Today's jet-setting shadow junkies typically spend one or two years saving money, researching hotels, and gathering gear for their next trip. An average morning for an eclipse chaser may include peculiar impulse purchases of weaponry, as some journeys take them through jungles and require a "bush knife". Or, they might need to research landmine distribution and booby trap avoidance strategies before entering hostile nations. Totality-lovers will go anywhere – even Antarctica – and face life-threatening conditions to get into that shadow.

The well-moneyed, and more impulsive umbra addicts will stop at nothing to dodge clouds, sometimes spending thousands of dollars on otherwise unnecessary flights so they can rise above the clouds and watch the sun go out from over a plane's wing.

That's exactly what American astronomy professor Jay M. Pasachoff did in 2007 when he encountered cloud on a chase in Argentina. After being turned down from airlines on strike, flights done boarding, and flights requiring visas, he finally booked a trip between Buenos Aires and Santiago, which lasted just two hours. He could barely see the eclipse, but got the co-pilot to take photos for him. That was Psachoff's 45th eclipse. He is the head of the International Astrological Union's Working Group.

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For those of us who are still total solar eclipse virgins, the extreme zeal of a chaser is hard to understand. We asked a few to tell us what makes them so loco for la lune's celestial coup d'etat.

"Eclipse chasers are average people!" insists David Makepeace, aka Eclipse Guy, of www.eclipseguy.com. (Total eclipses viewed: 15. Countries visited: 12. Continents: 7. Year of first sighting: 1991.)

The Irish group Ecliptomaniacs say they chase, in part, because it gives them a reason to travel to remote locations on distant continents they wouldn't otherwise visit. Most tour groups following this year's eclipse are booking sightseeing cruises or multi-city itineraries at least two weeks long.

For the most dedicated devotees, the chase is a lifelong pursuit. Makepeace says "It's not necessarily about seeing every eclipse. It's about realising that you are part of the universe and living life with this realisation." To this end, he has already researched "where every eclipse is going to be for the rest of my life". He isn't making travel plans for all of them just yet, "but I know where I'm going to be," he says. "Right now, most chasers are ready to go for July, and have deposits down for 2010."

On the topic of money, Makepeace insists that chasing is relatively affordable. It "does take some additional flexibility and some additional funds – but these things are generally available by choice," Makepeace says. "The idea that we need bucket loads of cash to see eclipses is false." He is currently employed as a video producer/director, which earns him "a comfortable living," he says, "But I have given up on owning my own house! Getting married! Having kids!"

That's the price Makepeace is willing to pay to be "Canada's busiest eclipse chaser," a claim he readily verifies. "I know who all of the eclipse chasers are, and I know when they chase and when they don't," he says. "I was the only Canadian chaser on the icebreaker to Antarctica in 2003, for instance." Among his fellow astrological alignment enthusiasts, the average chaser is "a bit older – a bit more financially established – a bit more able to work things his way. I think there are fewer chasers in their 20s."

Makepeace's advice to first-time viewers: "You don't even need a camera. For your first eclipse, just show up." Protect your eyes appropriately, then: "Open your eyes to the sky and open your soul to the world and let the umbra wash over you.

"You don't want to be burdened by equipment and a camera. These are just distractions. The beauty and majesty of this event should never be forsaken for the desire to capture and hold it. Ultimately, these things are impossible to achieve."

This statement is perhaps the most revealing of all, about the inner workings of chasers. It's not a craving for instant satisfaction as most "addictions" are. The chasers tend to take the long-view of life, and want to make a meaningful connection with the celestial whenever they can. Makepeace remembers his first time: "I'm not sure if I was breathing or not. When it was done, I was an eclipse-chaser."

There is one habit Makepeace mentions on his EclipseGuy site that does make chasers seem a wee bit obsessive: "Eclipse chasers like to keep track of the amount of time they've spent inside the moon's shadow. The number is expressed in seconds." His magic number: 1,703 seconds.

HOW IT HAPPENS

One of the most frequently referenced experts on eclipses is NASA's Fred Espenak (aka Mr. Eclipse, of www.mreclipse.com). The American astrophysicist has retired, but still runs NASA's eclipse website, and leads eclipse expeditions around the world. Total eclipses vewed: 22. Year first sighting: 1970. Here's what he's travelling 7,000km to see.

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Typically eclipses last 60 to 85 minutes as the moon partially covers the sun. "It's really boring. Not much happens," Espenak admits. "It's really the last five to 10 minutes before the eclipse becomes total that things start to change. You notice that the daytime illumination is dropping even though the sun is still visible. The moon's shadow is sometimes visible along the horizon like an approaching thunderstorm.

"If you happen to be near any type of trees, look underneath and you will see there are spots of sunlight shining through. They appear as crescents – the leaves act like tiny pinhole cameras and they project all these little crescents onto the ground. The drop in illumination is startling.

"You go from relatively bright daylight to twilight in under 20 seconds. And your eyes aren't adjusted to it, so it looks a lot darker than it is. It looks like about half an hour after sunset, not quite night, but you can start to see the stars. The thing that really grabs your attention is that the sun is now replaced by this black disc, which is the back side of the moon. Surrounding it is this white halo, the corona – it's unlike anything you've ever seen. It's got twists in it, it's got flying streamers. Sometimes you see bright red clouds – prominences. It almost looks like an eye up in the sky. So it's easy to understand how earlier civilisations thought it was the end of the world.

"Even understanding the mechanics of what's happening, there's a very physiological reaction. The hair on the back of your neck stands up, your adrenaline is rushing, there's a feeling in the pit of your stomach that something's wrong … and at the same time it's the most beautiful thing."

WHERE TO WATCH

"Because the sun is so big and the moon is so small, the totality is only going to be visible between about the distance between Shanghai and Guangzhou," says astronomy enthusiast and SMIC observatory director Micah Sittig. "In Beijing, people will see the sun and the moon in the sky at the same time (usually it's just the sun), but, it won't get dark." Shanghai and nearby towns are the best places to be in China.

Sittig reassures us that avoiding smog "won't be a big deal. The eclipse starts at 8.30am. Its midpoint is 9.30am. Because the sun rises so early in Shanghai, that means it will be almost at the halfway point of its climb in the sky. It will be 57 degrees up from the horizon. I checked." Sittig warns against going to the nearby Sheshan observatory. "That's a bit of a misconception – that you should go look through a big telescope. The best thing to do is find a big, wide open space with no obstruction in the eastern part of the sky – that's where the sun will be."

Sittig is going to the Shanghai Deepwater Harbour for an oceanside view, with a pinhole camera, a small telescope and filter, camera, "and of course family and friends. Astronomical events are great to experience with other people because they're good memories." Another option Sittig recommends is Jiaxing – halfway between Shanghai and Hangzhou (www.jxtourism.com).

David Makepeace, our profiled umbraphile, will "land in Shanghai on 19 July and will be speaking in Moganshan at Naked Retreats (www.nakeretreats.com) on 21 July."

To find out where you'll get the best show, try the Local Circumstance Calculator: www.eclipse-chasers.com

FOR A SOLO SHOW:
If you're looking for a private experience, and plan on setting up in the mountains, on a beach, in a field, or anywhere else without four walls and a floor, remember to pack: water, an umbrella, sunscreen, toilet paper, a blanket to lie on and a tarp for rainy/muddy conditions.

IF IT'S CLOUDY:
Go online. Our experts and chasers recommend this site for live and post-eclipse video and photos: www.spaceweather.com.

SAFETY FIRST – YOU ONLY GET ONE PAIR OF RETINAS

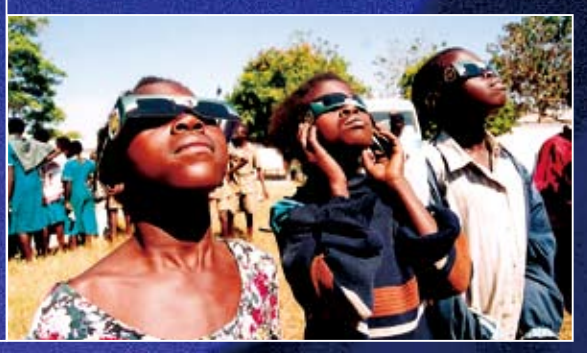
You need eye protection. Period. Yes, it's okay to enjoy yourself unprotected during totality, but if you don't time it perfectly, when that diamond reappears and the sun comes through, you risk lifelong blindness.

Theoretically, using black and white photo film that has been fully developed is an acceptable option, but it has to be old style stuff that contains silver. The cheapest and most reliable solution is to get aluminised mylar glasses, generally RMB 5-15, from local convenience stores or TaoBao. Look for the CE label and certification code – these will help you identify fully functional glasses made to the highest standards (from Germany and the UK). Welder's glass also works, but it must be type #14 opacity.

Polarised sunglasses, regular sunglasses, CD material, floppy disk material, X-ray film and colour film will NOT WORK. They may darken your view, but infrared rays will still get through and burn your retinas permanently, sometimes without even causing pain.

You also need a proper filter for telescopes and cameras you look through. Micah Sitting explains why these instruments are harmful: "It's like when you use a magnifying glass to create small burns. It's a lens. You're focusing light down to a point and it's really dangerous," when that's pointed at your eye. Try Taobao or electronics markets, or eclipse websites.

WIN one of five pairs of certified eclipse glasses by being one of the first five people to email us at talkback@talk.ismaychina.com with the words 'Solar Eclipse' in the subject line.



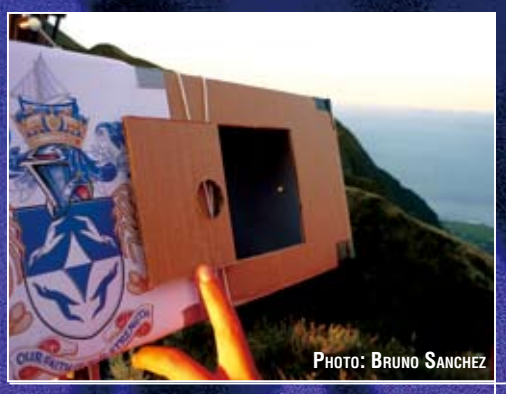


Photo: Bruno Sanchez

MAKE YOUR OWN PINHOLE PROJECTOR

Pinhole projection produces a really tiny image (just over 9mm for every metre of distance between the pinhole and the screen) The enclosed box sort (pictured above), needs to be large. Here's how to make a cheaper, simpler, more portable pinhole projector:

Get two pieces of cardstock from your local art/paper store, or cut up a cardboard box so you have two squares.

Use a pin to poke a hole in one piece of card. Toss one piece on the ground, and hold the other about a metre high, with your back to the sun for safety.

For more information, see www.exploratorium.edu/eclipse/how