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The Quest for



DEAN REGAS Travelers cross the globe in search of the moment when the Moon devours the Sun.

This was it: August 1, 2008, eclipse day. Skies were partly cloudy over the vast Chinese desert — the worst possible scenario for those without immense reserves of inner calm. Scott and Michelle Gainey had crossed the Pacific Ocean and the Gobi Desert, arriving at a remote western province called the Xinjiang Uygur Autonomous Region to witness a total solar eclipse, the most spectacular astronomical phenomenon — if the clouds would only go away.

Avid travelers, the Gaineys had always wanted to visit China, and the occurrence of a total solar eclipse provided a perfect excuse. Though not astronomers by profession,

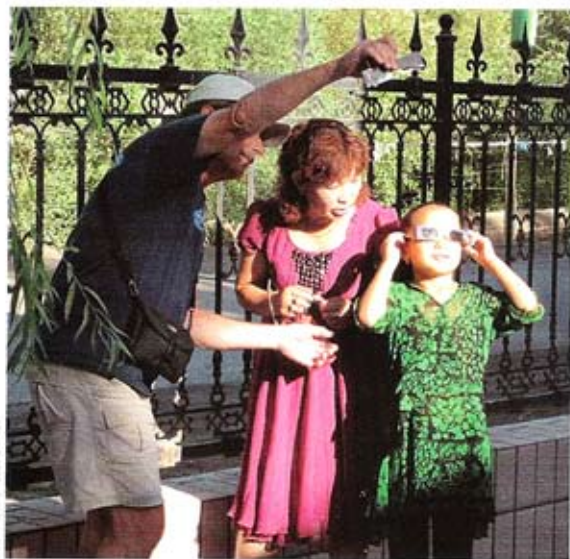
the couple first bonded over their mutual passion for the subject as members of the Cincinnati Astronomical Society, and even exchanged vows under the dome of the Cincinnati Observatory.

The eclipse tour brought them to amazing sites, such as the Old City of Shanghai, Taoist and Confucian temples, and the Mogao Caves. They were even granted special access to the archaeological dig of the Terra Cotta Warriors; while other tourists remained on the viewing platforms, their group walked among the excavated model soldiers. "At the time," Scott says, "this was perhaps more important to me than the eclipse."

As they traveled, Scott broke the language barrier to distribute safe solar-viewing glasses to people in the local community. Through his improvised astronomy outreach, Scott and the tour group distributed 100 filters, starting him on a trend of utilizing eclipses as the ultimate teachable moment.

Eclipse day was chaotic. The narrow path of totality crossed a desolate plateau near the Mongolian border. Cars, trucks, and buses full of eclipse chasers from around the globe appeared like mirages out of the desert. Various groups, apprehensive about the cloud cover, scurried across the plateau in pursuit of better conditions. Amid the commotion, the Gaineys sat patiently on Persian rugs under a canvas tent, watching the comings and goings of their concerned cohorts.

As totality approached, the Gaineys could feel the crowd's anticipation building. "High anxiety," Michelle called it. But then the clouds parted and there it was: a perfect black hole in the sky. The disk of the Moon blotted out the Sun and the eerie glow of the corona contrasted stunningly with the surrounding clouds. "I was planning to look for all of the effects, the shadow bands and prominences," Michelle recalls. "But all of that flew out of my mind and I was just lost in it. Gaga, really."

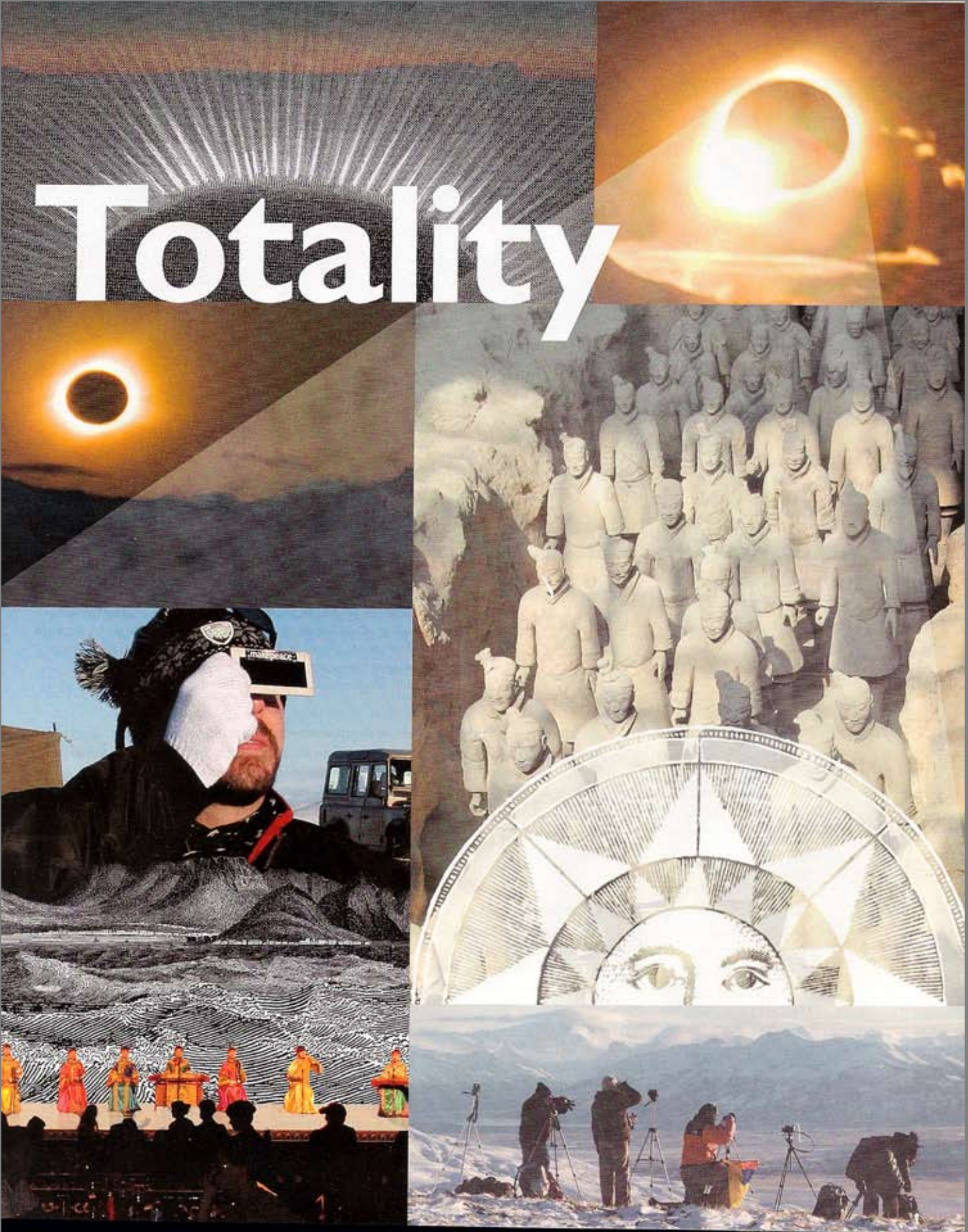


SCOTT & MICHELLE GAINEY

A TEACHABLE MOMENT The 2008 total solar eclipse provided the perfect opportunity to reach out to the local public in China. Scott Gainey and the tour group broke the language barrier to distribute 100 safe solar-viewing glasses.

FROM LEFT: GÖZKURT/ANATOLIA SUNSET; U.S. BOEING; IN-ADDER ECLIPSE; DAVID VAERFACE; TERRA COTTA WARRIORS; SCOTT & MICHELLE GAINEY; SUN ILLUSTRATION; © IMAGOPOLY.COM; ANATOLIA PHOTOGRAPHY; EBBA; ARTISTBY CHALIS; PHOTOGRAPHY; SCOTT & MICHELLE GAINEY'S SOLAR VIEWER; © MARK PIJSE; PHOTOGRAPHY; ECLIPSE; © MARK PIJSE

Totality





SCOTT & MICHELLE GAINEY III

A great howling erupted from the thousands of onlookers as the Moon's disk covered the Sun. People were dancing, singing, shouting, crying. To the Gaineyes, the years of planning and the long journey across the globe all led up to this brief moment of exhilaration shared with total strangers. Scott took a moment to tell himself, "This is really happening."

And then it was over — too soon, always too soon. A couple nearby, veteran eclipse chasers, had brought their own music to play, and they danced and twirled around long after the Sun re-emerged. Everyone was so happy to have seen the eclipse. And just like that, the Gaineyes were hooked. "As soon as it was over," says Michelle, "we knew that this was for us. We're going to do this again."

Starting the Chase

The Gaineyes are now members of a group of people who make it their purpose in life to see eclipses. They set aside money for astronomy-themed travel and plan vacations around astronomical events. They travel to the far corners of the globe for a glimpse of the greatest show from Earth. They are called eclipse chasers.

Eclipse chasers come from a wide variety of backgrounds. In 1995, 17-year-old Babak Tafreshi made an arduous 1,500-kilometer (930-mile) overland journey from his home in Tehran, Iran to the Afghanistan border to experience a mere 14 seconds of totality. Though tantalizingly brief, this eclipse, and the journey to witness it, hooked him. "From that moment, there was something

PERFECT BLACK HOLE The clouds parted just in time for Scott and Michelle Gainey to watch the Moon swallow the Sun over the Gobi Desert. Howling erupted around them as thousands of onlookers shared in the same brief reverie. *Inset:* The Gaineyes enjoyed dinner at a traditional Chinese theater, one of many cultural experiences they shared on their way to the eclipse site.

about this phenomenon that attracted me," says Tafreshi. He wrote about his experience for *Nojum*, an Iranian astronomy magazine.

Four years later, another total solar eclipse came to Iran. "Although Iran is a large country, it was such a rare occurrence to have two eclipses so close together," Tafreshi says. After successfully viewing his second total solar eclipse, he began to document the experiences of his new hobby by collaborating on a decade-long video project.



Babak Tafreshi

"It's such a unique form of travel," Tafreshi says. "And each eclipse reveals its own insights." Since being bitten by the eclipse bug, Tafreshi became an editor at *Nojum* (1997–2007), an *S&T* contributing photographer, a board member of Astronomers Without Borders, and a 2009 co-recipient (with Carolyn Porco of NASA's Cassini mission) of the Lennart Nilsson Award for scientific photography. He also founded The World at Night (www.twanight.org), an international organization that helps create and exhibit photographs and videos of the night sky.

Meanwhile, Tafreshi's travels continued. On June 21, 2001, Tafreshi traveled to the unspoiled wilderness in central Zambia. Together with the seasoned German adventurer Gernot Meiser, he trekked an hour away from the nearest village to witness what he calls "one of the best eclipses I have seen."

"I really felt how nature reacts to this powerful natural phenomenon — birds flying to nests, a sudden bizarre silence, and insects jumping out to celebrate the brief night," Tafreshi recalls.

Afterward, Tafreshi and Meiser hiked in Kafue National Park in Zambia, enjoying the wilderness and the dark skies before returning home. Before sunrise one morning, Tafreshi was setting up a shot of the Magellanic Clouds. "I found a big, photogenic rock to place in the foreground," Tafreshi remembers. "I started to illuminate it with a flashlight to take the exposure when I noticed two bright dots reflecting on the rock. Then the whole rock started to move toward me."

The "rock" turned out to be a hippopotamus, the most dangerous large animal in Africa. With no time for thought, Tafreshi ran to the safety of camp, the still-exposing camera in hand.

On the Icy Bottom of the World

In 2003 Tafreshi's travels took him to the opposite extreme when he voyaged to Antarctica aboard a Russian icebreaker. The first eclipse to be viewed from the most forbidding continent, the expedition was as expensive as it was rare: more than \$25,000 per person. Fortunately, Tafreshi found a sponsor, fellow Iranian eclipse-chaser Hamid Khodashenas. Tafreshi's job was to document the entire journey through one of the least traveled locations on Earth, as well as to manage the photo shoot during the brief moments of totality.

Sailing from Port Elizabeth, South Africa, the passengers were an international community — 100 people from 15 countries. The ship traversed the ice over many months, making several stops at Antarctic islands rarely visited by humans. Tafreshi discovered that the difficult journey to reach the narrow eclipse centerline in such an isolated and exotic location naturally united diverse groups of people.

This was no pleasure cruise but a working expedition in cold, harsh conditions. Several passengers suffered major injuries during severe storms before the ship reached the calm Antarctic waters. Ice cracks, hidden by snow, posed another danger once the passengers ventured out from the ship. Helicopters were available to ferry injured passengers back to the ship for urgent care, but sending anyone back to civilization was not an option — the next transport to the area would arrive six months later.

On eclipse day, November 23rd, the captain rammed the vessel into a thick shelf of ice. When the crew deemed the landing spot safe, the chasers bounded down, wearing

their warmest parkas and mingling with the penguins. Icebergs stood above a stark, white landscape, and a colorful horizon ringed their temporary beachhead. Despite some clouds, the eclipse experience was spectacular.

"I can safely say that the penguins had absolutely no reaction to the eclipse," Tafreshi notes. The humans felt otherwise. They were standing on the icy bottom of the world, slowly drifting with the entire Southern Ocean below them. "It was like walking on a different planet."

The Eclipse that Demanded to be Seen

David Makepeace is a video producer and director in Toronto, Ontario, whose many eclipse chases have earned him the nickname "The Eclipse Guy." He witnessed his most recent total eclipse on July 11, 2010 from a remote outcrop on the Patagonian steppe. But that was Plan C.

Plan A was to sail on a clipper ship from Tahiti into the path of totality. When the cruise line canceled the trip with only months to spare, Makepeace scrambled to book Plan B. That involved flying to El Calafate, a small mountain town in southern Argentina, in order to catch a charter plane that would fly along the Moon's umbral shadow.

On the way, Makepeace added a stopover in Peru to hike the Inca Trail and experience Machu Picchu. Drawn



THE KAPITAN KHEBNIKOV Babak Tafreshi stands in front of the Russian icebreaker that ferried an international group of 100 eclipse chasers from the southern tip of Africa to Antarctica.



HAROLD ENDOASHENAS

to Peru's mystical allure, Makepeace wanted to hike the same path the ancient Incas took to reach their city in the mountains. He relished the challenge of the four-day trek. Despite his fear of a deadly fall, the experience of walking a path cut into massive cliff faces through the heart of the Peruvian jungle was exhilarating. "Don't look down," Makepeace recommends.

The final day of the hike was grueling, mentally and physically. His group passed a shrine of piled stones where people had left offerings, including pieces of chocolate. When Makepeace asked about the shrine, his guide made up a story, saying it was a spot sacred to the Incas. Makepeace later learned the truth — it was a marker erected at the spot where a hiker had fallen to his death.

At last his group took the final steps of the Inca Trail, came over a ridge, and beheld the city. Exhausted and awestruck, Makepeace stepped through the Sun Gate into what seemed like a vision arising out of the mists. The ancient ruins of Machu Picchu lay before him framed by verdant peaks and steep drop-offs. "This was not meant to

PENGUIN PARTY Tafreshi and the other eclipse chasers walked freely in Antarctica among the emperor penguins, who paid them (and the eclipse) no mind.

be an easy stroll," says Makepeace. "You are meant to be changed by this arduous journey. Along the way I came to understand the Incan reverence for the Sun."

His transcendent Peruvian adventure came to a sudden halt after he descended from Machu Picchu. At the town below the ruins, Aguas Calientes, Makepeace went to an internet café and received what he calls "the worst e-mail of my life." There would be no charter plane in El Calafate. Flight canceled, no explanation, no viewing of the eclipse that was only two days away.

Cursing his luck (and the tour company), Makepeace decided to continue the journey and see what might lie in El Calafate. He flew to southern Argentina in the dead of winter. Conditions were dark, snowy, cold, and windy, with no apparent prospects of seeing the eclipse. "What the hell am I doing here?" he asked himself.

He commiserated with other stranded eclipse chasers, and together they hatched a plan. The eclipse would not be visible from town, which lay in the easternmost extent of the path of totality. The Sun would set behind the Andes Mountains before totality occurred. But a group emerged with an impromptu plan: take four-wheel-drive buses up the slopes to gain elevation, and perhaps see the final glimpses of totality. The Sun would be extremely low in the sky, at a location that had been cloudy the previous two weeks. Statistically, this was the worst place along the path of totality to see the eclipse.

"There was no other choice," says Makepeace. "At that point I would have paid the last dime I had to see this thing." This was Plan C.

MACHU PICCHU

David Makepeace stands near the Sun Gate entrance after an arduous trek to the ancient Incan ruins.



DAVID MAKEPEACE

Two buses equipped with tire chains picked up the chasers at a local hotel. Each bus carried 20 to 25 people up a crude, snowy path to the desolate mountaintop, where the facilities resembled a lonely military outpost. A large, canvas tent protected the chasers from the wind, and a satellite TV played the World Cup final. Snow was blowing in a howling gale around them, and the air was bitter cold. But the sky was crystal clear. "The conditions were absolutely ideal," Makepeace recalls. "I couldn't believe it — we were actually going to see it!"

Makepeace observed the rapid approach and retreat of the Moon's shadow across the distant hills and valleys. With the Sun only a few degrees above the horizon at totality, the corona and the entire sky were bathed in an ethereal golden hue for 2½ minutes.

"Through all of the hardships and stress, I almost believe that this eclipse demanded to be seen," says Makepeace. An eclipse chaser often negotiates with the universe, never knowing with certainty what will happen on eclipse day or on the winding road there. Even with the best-laid plans, it comes down to living in the moment.



TO THE ANDES Four-wheel-drive trucks took an impromptu tour group up a crude mountain path for a chance to view the eclipse above the Andes Mountains.

DAVID MAKEPEACE (2)



Watch a BONUS VIDEO



To see David Makepeace's footage of the Antarctic and Patagonian eclipses, visit skypub.com/eclipsechasers.

What's Coming Up

For those looking ahead, the date August 21, 2017 stands out. This is the next total solar eclipse visible in the United States. But why wait? This year, there will be a total solar eclipse visible in Australia and the South Pacific on November 13th (April issue, page 68). The moon's umbra will fall along the northeastern tip of Australia, crossing the Gulf of Carpentaria, so this is a perfect chance for a South Pacific cruise or a trip to the Land Down Under.

Experienced eclipse chasers have seen it all. They've traveled to every continent to marvel at totality, and they've also met agonizing defeat at the hands of capricious clouds. They'll tell you all about it. In fact, swapping eclipse stories is their favorite pastime. Their descriptions of awe-inspiring successes and painful missed opportunities reveal the real story — witnessing the Moon's struggle to block out the Sun may be exhilarating, but getting there is half the fun. Chasing eclipses is more than a job, or even a deep-rooted passion: it's a way of life. ♦

Dean Regas is the Outreach Astronomer for the Cincinnati Observatory in Cincinnati, Ohio, and cohost of the television program Star Gazers. He can be reached at dean@cincinnatiobservatory.org.

TOTALITY Shouts of joy rang out in the crystal-cold air as David Makepeace viewed the eclipse just moments before sunset.