

SOUTHERN LIGHTS: FIRST NATIONS AUSTRALIANS' LEARNING AND LORE

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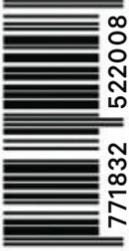
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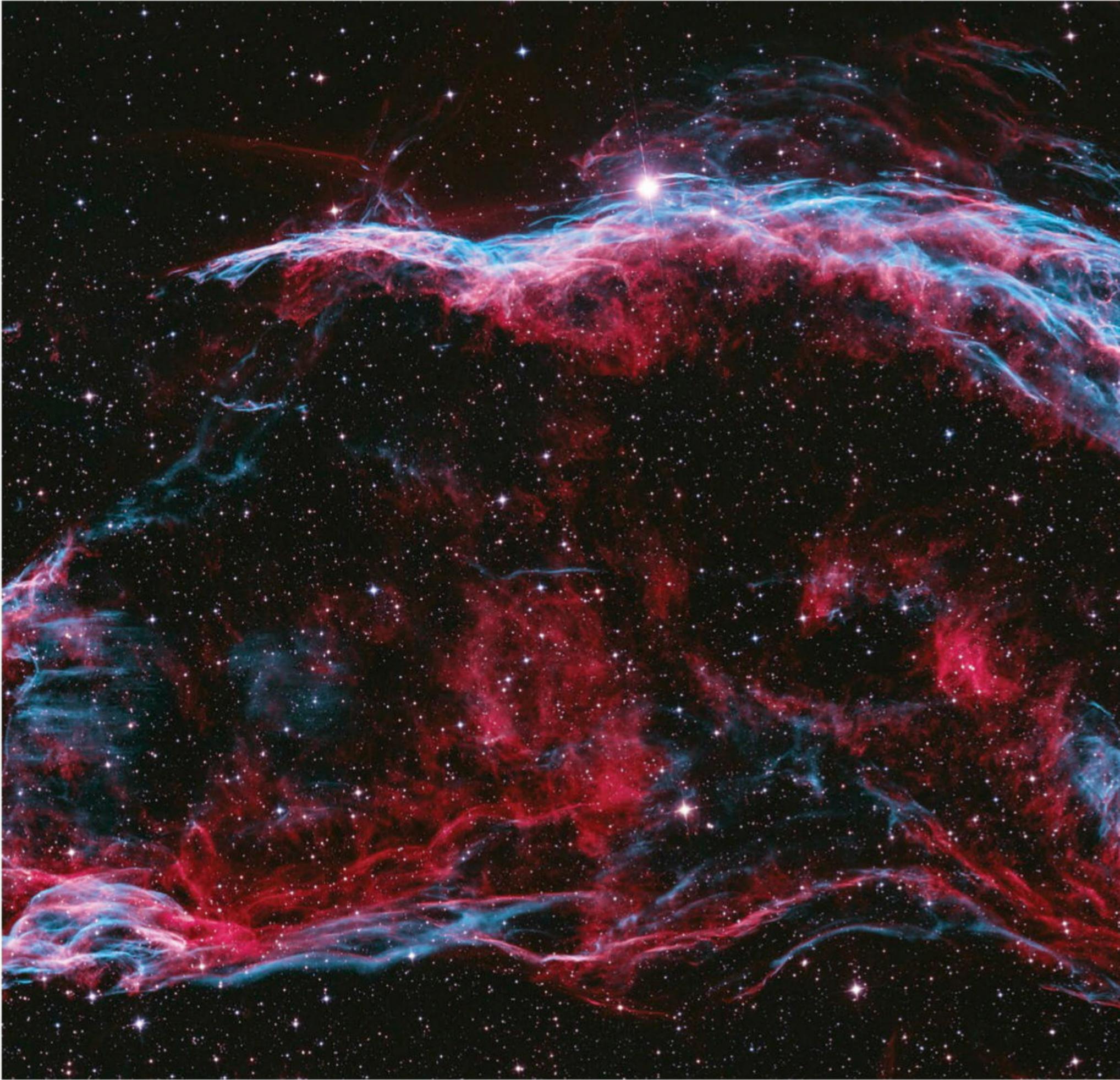


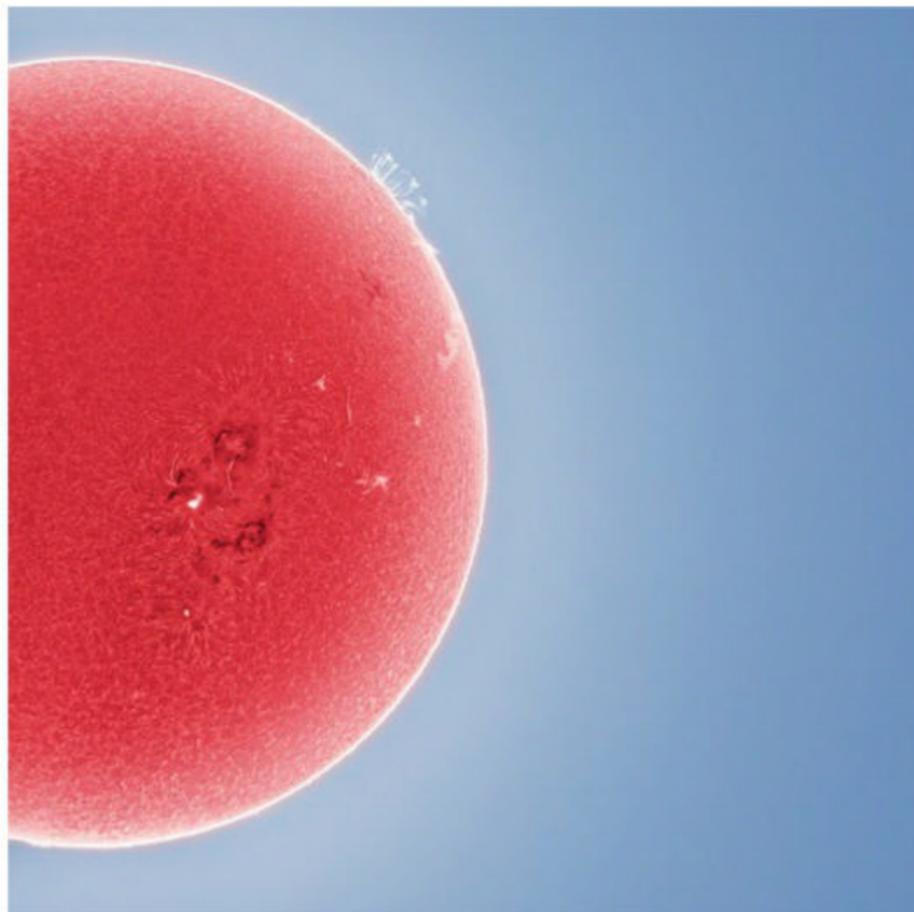
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Shooting the stars





An active star (above): In December 2019, our Sun embarked on a new solar cycle that is expected to last for 11 years. This image was snapped just after the emission of a large solar flare, the first major activity of the cycle, showing how the Sun's magnetic field "pulls up" parts of the chromosphere, with the field lines clearly visible on the upper edge of the disc. The image was captured in black and white, then processed to place the events on the star's surface in high contrast.

Photographer: Andrew McCarthy (USA)

Beyond the veil (left): This spectacular cloud is all that remains of a massive supernova that exploded more than 10,000 years ago. Known as the Veil Nebula, this cloud is composed of filaments of hot gas and dust that stretch rope-like across the sky. It's a popular object for amateur astronomers; this image, which only shows a fraction of the whole nebula, was processed from monochrome images of hydrogen-alpha and oxygen emissions, taken across several months.

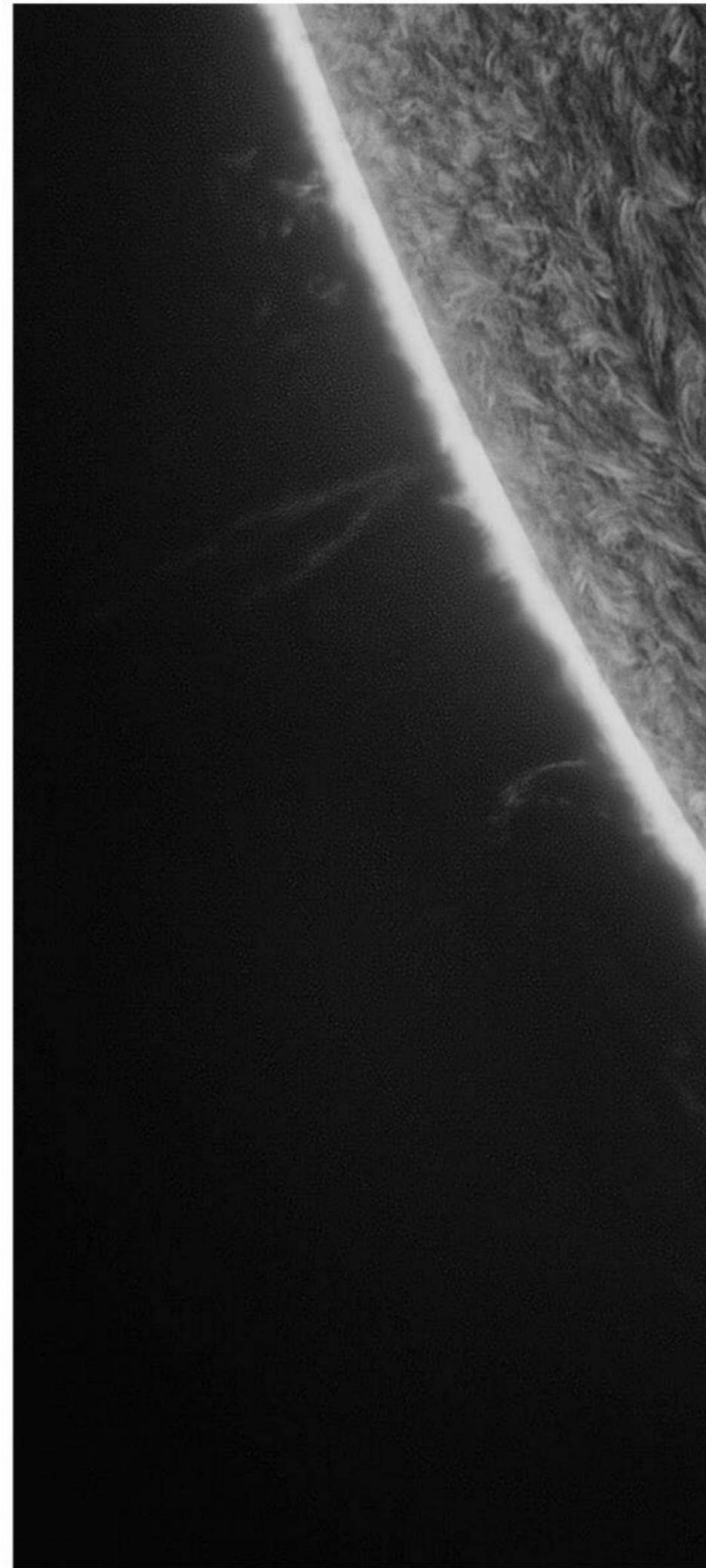
Péter Feltóti (Hungary)

The Royal Observatory Greenwich's Astronomy Photographer of the Year award is the largest astrophotography competition in the world. Each year, it showcases the best of space photography, from Earthly skylscapes to distant planets and galaxies.

Visit www.rmg.co.uk to see the winners.



Blowing bubbles (above): Around 70,000 years ago, a Wolf-Rayet star shucked off its outer hydrogen layers and blasted them out into space with interstellar winds travelling at more than 1,700 kilometres per second. These cosmic forces sculpted this bubble, known as Dolphin-Head Nebula, located in the constellation of Canis Major. *Yovin Yahathugoda (Sri Lanka)*



Ancient astronomy (left): In mid-2020, Stonehenge was witness to Comet NEOWISE – the brightest comet to grace the northern hemisphere's skies since Comet Hale-Bopp in 1997. The builders of Stonehenge would have had no concept of this comet; it last passed by Earth 6,800 years ago, long before the monument was erected. *James Rushforth (UK)*



The spotty Sun (above): Our Sun may be middle-aged but it acts more like a teenager – restless, sometimes violent and covered in spots. Called sunspots, these “holes” are cooler areas on the surface, formed when the Sun’s rotation twists up its magnetic field and inhibits convection. This image depicts the chromosphere – one of the Sun’s three layers – as hot plasma flickers along the magnetic field lines.

Siu Fone Tang (USA)



Vortex of ice and light (above): On a freezing winter's night in the south of Iceland, the Aurora Borealis swept across the skies in a curtain of shimmering colour. These celestial light shows are put on when a stream of charged particles from the Sun soar down along magnetic field lines into our upper atmosphere, where they crash into gas molecules and release energy in huge swathes of coloured light. This panorama is composed of 20 images – two rows of 10, pieced together. *Larryn Rae (New Zealand)*



Iconic trails (left): Stars sketch bright trails across the sky above an unusual foreground – the leering face marking the entrance to Luna Park, Sydney's heritage-listed harbourside theme park. This face usually glows brightly – except for a few hours in the early morning, allowing this image to be compiled from thousands of frames snapped over several hours. *Ed Hurst (Australia)*



Tunnel vision (above): In the Icelandic winter, the Aurora Borealis ignites the sky again through the tunnel of an ice cave. These kinds of structures form when meltwater runs under or through a glacier, carving out passageways through the ice.

This image is a double exposure – one of the cave and one of the aurora.

Markus van Hauten (Germany)

Lavender lights (below): The Milky Way arcs in a mesmerising panorama above lavender fields in Valensole, France, with light pollution from nearby towns brightening the horizon. The light from hot gas and more than 100 billion stars combine to create the spectacular glow of our galaxy, while dark clouds of cosmic dust block background stars in mottled patches.

Stefan Liebermann (Germany)





An elegant competition (above): With its distinctive French Renaissance architecture, the Château de Chambord in France has an enchanting atmosphere – but its magic is outshone by the Milky Way, soaring up in the night sky behind it. Taking this image was particularly challenging, as the photographer had to compete with the château's own light show, which only paused for one minute in every 15.
Benjamin Barakat (UK)



Light-making motions (above): Driving on a mountain road in Tibet late one night, with the Milky Way in glorious colour above, a photographer spotted the perfect opportunity – he set up his camera on a hill by the roadside, then drove back and forth to streak the curving road with light. This image is the result of three 25-second exposures.

Yang Sutie (China)

The tumult of the Sun (above): This kaleidoscope of colour is a combination of three different wavelengths of light, painstakingly selected from the thousands of images available in NASA's Solar Dynamics Observatory collection. The original snaps were taken by the orbiting observatory in January 2015 when our Sun was close to solar maximum, revealing the turbulent nature of our star.

Hassan Hatami (Iran)

