less-than-heavenly sources. The problem was especially acute at the site in Livingston, Louisiana, which is in the middle of a timber plantation. Any felling of trees would disturb the detector, so it could keep its laser beams 'in lock' — vibrating at precise frequencies — only at night or on weekends. A passing train would knock the site out for an hour, says physicist Brian O'Reilly, who will coordinate the follow-up of detections at the Livingston site. But now, he says, the detector should be able to take data over several days at a time without interruption.

Advanced LIGO is already three times more sensitive than its predecessor, but in three months' time it will shut down for more improvements that will make it ten times more sensitive. When it reopens around 9 months later, it should be able to spot cosmic ripples from cataclysmic events — such as the collisions of black holes — up to 120 megaparsecs (326 million light years) away on a regular basis and sample a volume of space 1,000 times greater than the original observatory.

Next year, LIGO will be joined by a slightly smaller €200-million (US$226-million) Franco-Italian detector near Pisa, Italy, called Advanced Virgo, which is undergoing its own upgrade. The LIGO and Virgo teams will pool their data to check each other's detections. They expect to see waves from mergers of binary neutron stars — events that should generate strong, predictable signals — but do not know precisely how many to anticipate. "It could be, depending on the models, ten binary neutron star detections a year or so," González says. "But it could be 10 times higher or 100 times lower."

"The first detections will be quite dramatic for us," says Rainer Weiss, a theoretical physicist at the Massachusetts Institute of Technology in Cambridge who was one of LIGO's founders. "The first thing we will need to sort out is whether we truly believe what we are seeing."

Having detectors on different continents is crucial for providing a rough estimate of the origin of the waves, says Fulvio Ricci, a physicist at the Sapienza University of Rome and the spokesperson for Virgo. Once they know that, astronomers will be able to look for other signs of that event using electromagnetic radiation, such as X-rays or visible light.

Einstein published his first papers on gravitational waves in 1916. Detecting these ripples a century later, Weiss says, would be of "enormous symbolic importance". ■

A meteor (upper left) streaks through the Orion constellation during the Perseid shower.

BABAK TAFRESHI/NATIONAL GEOGRAPHIC CREATIVE

ASTRONOMY

Dates added to meteor calendar

Skywatching cameras spot 86 previously unknown events.

BY ALEXANDRA WITZE

The list of meteor showers that occur every year has just grown longer. Eighty-six previously unknown showers have now joined the regular spectaculars, which include the Perseids, Leonids and Geminids. Astronomers spotted the shooting-star shows using a network of video cameras designed to watch for burglars, but repurposed to spy cosmic debris burning up in Earth's atmosphere.

The newfound showers are faint but important: each is fuelled by Earth's passage through a trail of particles left behind by a comet or asteroid, so mapping them reveals previously unknown sources of dust.

"The cool thing is, we are not just doing surveillance of meteors in the night sky," says Peter Jenniskens, an astronomer at the

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SETI Institute in Mountain View, California. "Now we also have a three-dimensional picture of how dust is distributed in the Solar System."

Most of the particles are the size of a sand grain, but a few are large enough to survive the searing heat of their passage through the atmosphere — and possibly do damage on Earth's surface. Jenniskens and his colleagues describe the discoveries in four papers accepted for publication in *Icarus*.

Astronomers have been documenting meteors for centuries, first by eye and more recently with radar and video-tracking systems. Meteors sprinkle Earth steadily throughout the year, but during a shower a significant number seem to originate from the same point in the sky. Skywatchers around the world have reported more than 750 possible meteor showers to the International Astronomical Union (IAU) — but only a small fraction of those have been confirmed as bona fide events.

SKY SURVEILLANCE

Jenniskens' team set up cameras at three locations in northern California to confirm or rule out these rumoured showers. The Cameras for Allsky Meteor Surveillance (CAMS) project points 60 security cameras in different directions to capture as many shooting stars as possible. Each has a relatively narrow field of view, but together they cover a broad dome of sky centred directly overhead and extending down to 30° above the horizon.

"CAMS is about getting massive data sets on meteors, so you can see through all the scatter to get at those new showers," says Phil Bland, a planetary scientist at Curtin University in Perth, Australia. He helps to run a tracking network in the Australian outback that looks for extremely bright meteors in an effort to recover meteorites on the ground.

"The more we sample the sky, the more detailed our picture becomes."

Since it began in 2010, CAMS has measured more than 250,000 meteors. Of those, about three-quarters were random singletons and one-quarter came in showers. CAMS has confirmed 81 showers that were on the IAU's questionable list, and discovered 86 new ones.

Among these is one that lights up Southern Hemisphere skies in early December, and seems to radiate from the constellation Vela. It is surprisingly strong for a shower that had not been noticed before, says Jenniskens. During the March 2013 peak of a newly confirmed shower, skywatchers saw the bright flash of a rock-sized object hitting the Moon.

The CAMS team has been expanding its search by setting up smaller camera networks in the Netherlands and New Zealand. "The more we sample the sky," says Jenniskens, "the more detailed our picture becomes of what is coming in." ■

CORRECTIONS

The News story 'Encryption faces quantum foe' (*Nature* **525,** 167–168; 2015) incorrectly named the location for the cryptography workshop that began on 6 September. The workshop was held at the Schloss Dagstuhl–Leibniz Centre for Informatics in Wadern, not the Leibniz Center for Informatics in Oktavie-Allee.

The News Feature 'Fishing for the first Americans' (*Nature* **525,** 176–178; 2015) incorrectly credited the photo taken at Cooper's Ferry. Credit should have gone to Hayden Wilcox, not Joanne McSporran.

The News story 'Health study set to decide data policy' (*Nature* **525,** 16–17; 2015) incorrectly stated that an NIH working group planned to create a blanket data-sharing policy for the Precision Medicine Initiative. It is in fact developing a policy that can accommodate participants' varying interest in seeing their own genetic information.