

# New Scientist



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## Virgo 3.0



Photographer **Enrico Sacchetti**

THIS magnificent instrument, captured by photographer Enrico Sacchetti, is the Advanced Virgo+ interferometer. The image has been shortlisted for a major science photography prize, while the detector itself is on a quest for another sort of glory.

Run by a European consortium and located in the village of Santo Stefano a Macerata, Italy, Advanced Virgo+ is an upgrade to one of the detectors that hunt for clues about the universe's origins contained in gravitational waves. Virgo has been used alongside two other detectors that make up the US-based Laser Interferometer Gravitational-wave Observatory (LIGO).

The waves were predicted by the general theory of relativity, and they are made when massive objects in space move, creating ripples in space-time that stretch and squeeze everything they pass. LIGO and Virgo use this stretching and squeezing to work out what caused the ripples. Last September, they pulled off one of their biggest successes yet when they spotted two black holes smashing together to form another one with a mass 142 times that of the sun.

Advanced Virgo+ is the third incarnation of the Virgo detector, each one improving its sensitivity to gravitational waves. The detector's 3-kilometre-long north arm can be seen in the left of the image, while on the right is its squeezing cavity, which helps reduce "quantum noise", a phenomenon limiting sensitivity to the waves.

Sacchetti's shot has been shortlisted for the 2020 Science Photographer of the Year competition, organised by the Royal Photographic Society. ■

**Gege Li**