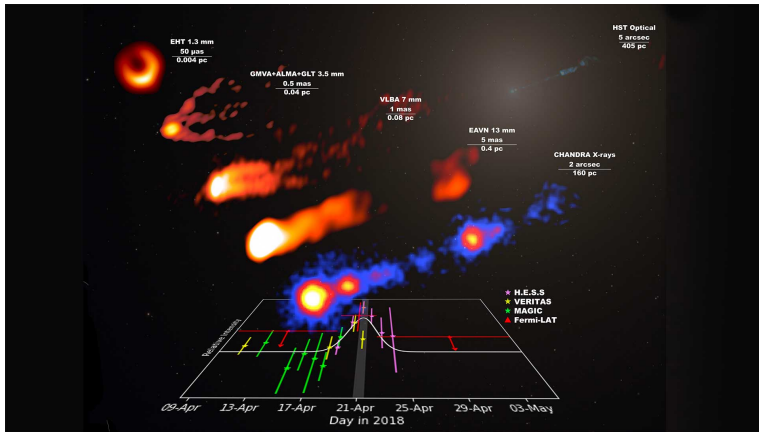


Archive News & Press Release

UNEXPECTED FLARE IN M87 JET OBSERVED BY GAMMA-RAY RADIO WAVES



The Event Horizon Telescope (EHT) international scientific collaboration recently observed and studied at different wavelengths a spectacular flare from the powerful relativistic jet at the centre of the same galaxy, the brightest in the Virgo cluster. The study presents data from EHT's second observation campaign carried out in April 2018, involving more than 25 ground-based and orbiting telescopes. In the study, coordinated by the EHT-MWL research group

that also includes INFN, the National Institute of Astrophysics (INAF), the University of Trieste and the Italian Space Agency (ASI), the authors report the first observation in more than a decade of a gamma-ray flare at very high energies - up to trillions of electron volts - from M87*, after having obtained the spectra of the galaxy nearly simultaneously with the widest wavelength range collected to date. The [article](#) was published in the journal *Astronomy & Astrophysics*.

The energy flare, which lasted about three days, revealed that the emission was unbalanced toward higher energies than typically emitted by M87's black hole. Pushing ultra-high-energy material outside the host galaxy, the relativistic jet examined by the researchers has an astonishing extension reaching dimensions that exceed those of the black hole's event horizon by tens of millions of times. In particular, these results provide the first opportunity to identify the point where the particles causing the flare are accelerated, a fact that could potentially resolve a long-standing debate about the origin of cosmic rays detected on Earth.

The data published in the paper also shows significant variation in the position angle of the asymmetry of the ring (the so-called "event horizon" of the black hole), as well as in the position of the jet, revealing connections between these structures on very different dimensional scales. Among the telescopes involved in the campaign are Fermi (with the LAT instrument), NASA's NuSTAR, Chandra, and Swift, and the three largest IACT (Imaging Atmospheric Cherenkov Telescope) telescope devices for very high-energy gamma-ray astronomy from the ground (HESS, MAGIC, and VERITAS), with which it was possible to observe and study the duration and emission characteristics of the high-energy flare.