

ESO Electromagnetic Observation of GW170817 Gravitational Wave Factsheet



Gravitational wave detection

Name: GW170817

Date and time of detection: 17 August 2017 12:41:04 UT

Wave duration: approx. 100 seconds

Detected by: LIGO in Hanford, Washington, USA and Livingston, Louisiana, USA

Non-detection by Virgo Interferometer in Italy helped localise the source

Short Gamma-ray Burst Detection

Name: GRB170817A

Date and time of detection: 17 August 2017 12:41:06.48 UT

Duration: approx. 2 seconds

Detected by: NASA's Fermi Gamma-ray Burst telescope and ESA's INTEGRAL telescope

Neutron Star Merger Source

Name: AT2017gfo or SSS17a

Location: NGC 4993, a galaxy in the constellation of Hydra.

Distance: 40 Megaparsecs or approx. 130 million light-years

Merged object sizes: Between 1.1 and 1.6 solar masses

Kilonova

Mass ejected: Between 0.03 and 0.05 solar masses (about 13 000 Earth masses)

Initial ejecta speed: one-fifth the speed of light

ESO Observations of the Kilonova

The 7 ESO-related telescopes and 14 instruments that participated in the observing campaign were:

1. VLT
 - a. FOcal Reducer and low dispersion Spectrograph 2 (FOR2) (UT1)
 - b. Nasmyth Adaptive Optics System (NAOS) – Near-Infrared Imager and Spectrograph (CONICA) (NACO) (UT1)
 - c. X-shooter spectrograph located on Unit Telescope 2 (UT2)
 - d. Visible Multi-Object Spectrograph (VIMOS) (UT3)
 - e. VLT Imager and Spectrometer for mid-Infrared (VISIR) (UT3)
 - f. Multi Unit Spectroscopic Explorer (MUSE) (UT4)
 - g. High Acuity Wide-field K-band Imager (HAWK-I) (UT4)
2. VST observed using the OmegaCAM
3. VISTA observed with the VISTA InfraRed CAMera (VIRCAM)
4. NTT

- a. Visible spectra were observed with the ESO Faint Object Spectrograph and Camera 2 (EFOSC2) spectrograph
 - b. infrared spectra were observed with the Son of ISAAC (SOFI) spectrograph.
5. The MPG/ESO 2.2-metre telescope observed using the Gamma-Ray burst Optical/Near-infrared Detector (GROND) instrument.
6. Italian Rapid Eye Mount (REM) telescope
7. Atacama Large Millimeter/submillimeter Array (ALMA)