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Optical Follow-up Observation of the Gravitational Wave Source, GW170817

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On August 17th 2017, for the first time in the history, the gravitational wave (GW) detectors recorded signals coming from the merger of two neutron stars. This event was named as GW170817, and more interestingly, gamma-ray emission was detected 2 seconds after the gravitational wave signal, and 11 hours later, telescopes in Chile identified that the GW signal came from the NGC 4993 galaxy at the distance of about 40 Mpc. This is again the first time that electromagnetic (EM) signals are detected for a GW source. The follow-up observations by astronomers all around the world, including our group in Korea, successfully identified the optical emission as the kilonova, the elusive optical/NIR counterpart that has been proposed to originate from a neutron star merger. Yet again, this marks the first time that a kilonova was discovered convincingly. This whole event started the new era of astronomy, so-called the "multi-messenger astronomy", where the combined information from GW and EM radiation reveals an unprecedented view of the universe. In this talk, I summarize this exciting event, and describe the efforts by Korean astronomers that have led to important discoveries about the kilonova and the host galaxy properties, and finally provide the future prospects.

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