Mobile app to provide the latest on black hole collisions and merging neutron stars

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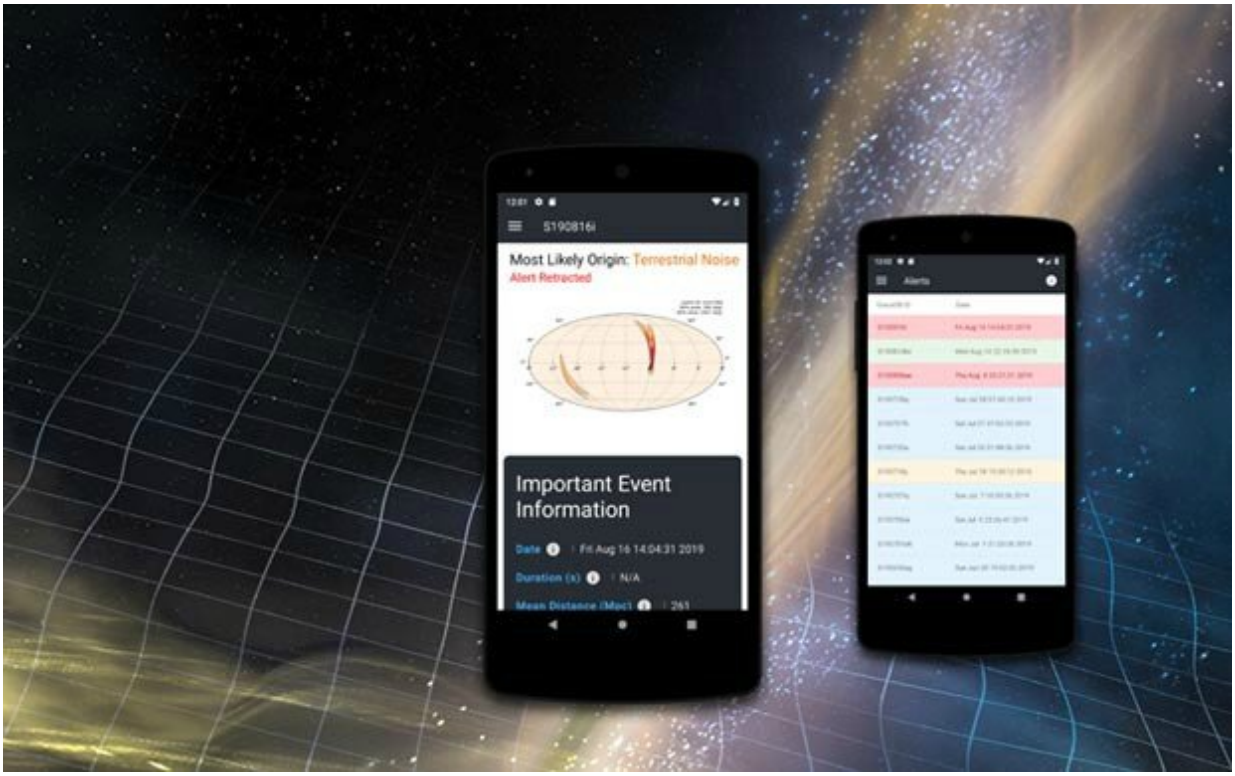

Credit: University of Birmingham

PhD students from the Institute for Gravitational Wave Astronomy have released a new app to encourage members of the public to stay up to date with new gravitational wave events in near real time.

Chirp, designed for use on mobile phones, displays the latest alerts from Laser Interferometer Gravitational-Wave Observatory/Virgo about a possible new gravitational wave. For every new and previous alert you can look up preliminary information about the source of the event, for example whether the signal indicates a black hole collision, or merging neutron stars.

These detections are made by an international team of scientists, including those from the University of Birmingham using the two LIGO detectors in the USA and the VIRGO detector in Italy. The LIGO detectors are the same detectors that won the Nobel prize for Physics in 2017. Along with VIRGO they made a direct observation of a neutron star collision through gravitational waves which started the era of multi-messenger astronomy.

With the start of the third observing run, these gravitational wave events are being released for the first time on public alerts allowing anyone to join us on our journey to discover more about the universe.

Then Postgraduate student, now research fellow Sam Cooper explained his idea for making the app.

"I'd long wanted a way to showcase to my young cousins what I was researching at university and why I couldn't play more Mario Kart with them during the week! I wanted to display the event information in a clear and understandable way, which is the driving focus of Chirp."

Gravitational waves are generated by some of the most catastrophic, violent events occurring in the Universe, such as the collision of black holes and neutron stars. The gravitational waves detected on 14 September 2015 originated from two black holes, each around 30 times the mass of our Sun and located more than a billion light years from Earth, merging to form a single, more massive black hole. The discovery

confirms one of the major predications of Albert Einstein's 1915 theory of general relativity.

Aaron Jones another PhD student added, "I develop new technology for the Gravitational Wave detectors here in Birmingham. Observing run 3 was particularly exciting as we have improved the detection sensitivity. I was excited to develop this with Sam because at a glance I can now see a quick overview of the detection candidates and their probable origins."

Sam Morrell another PhD student at the University of Exeter added: "I have been intrigued for a long time about the potential promise that modern technologies have for tapping into the public enthusiasm for cutting edge science. So when Sam discussed with me his vision for Chirp - to make an easily accessible resource to enable everyone to follow gravitational wave alerts - I was excited to help out."

The app can be downloaded at the links below.

More information: iOS: apps.apple.com/app/chirp-gravi … ave-app/id1484328193

Android: play.google.com/store/apps/det … =org.laserlabs.chirp

Provided by University of Birmingham

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