



# PHYSICS COLLOQUIUM



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## **LIGO Signals from the Mirror World**

### **Abstract**

We suggest that a major fraction of binary black holes and neutron star mergers, which might provide gravitational wave signals detectable by LIGO/VIRGO, emerged from the hidden mirror sector. Mirror particles interact only gravitationally, which is the reason why no electromagnetic signals accompanying gravitational waves from mergers with components composed of mirror matter are expected. Since mirror matter is cold, star formation in the mirror world can start earlier and mirror black holes have more time to gain mass and create more binary systems within the LIGO reachable zone. If the dark matter budget of the universe is mostly mirror particles, we predict that only about one binary system merger out of ten detectable by LIGO/VIRGO could be accompanied by a gamma ray burst. It seems the list of candidate events recorded by LIGO/VIRGO during the third observational run supports our predictions. We consider the possibility that LIGO events GW190521, GW190425 and GW190814 may have been mirror world binaries.

**3:00 p.m. - 4:30 pm, Friday, September 16<sup>th</sup>,**  
**In-Person: McLane 162**