

# Neutron Star Oscillations in Alternative Theories of Gravity

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## ABSTRACT

The gravitational waves were detected directly for the first time very recently. This opens a completely new window towards exploring the Universe. The gravitational radiation can be used to test the strong field regime of gravity as well. In this talk we will present results about one of the most promising emitter of gravitational waves – the oscillating neutron stars in alternative theories of gravity, and more precisely in (massive) scalar-tensor theories and  $f(R)$  theories of gravity. We will cover both the static and the rapidly rotating cases. The differences with pure general relativity will be thoroughly examined and the possible ways to test the strong field regime of gravity via the forthcoming gravitational wave observations will be explored.