Contribution ID: **67** Contribution code: **P10** Type: **Talk**

Can the X-ray binaries in M83 be the progenitors of gravitational waves sources for LIGO/VIRGO/KAGRA?

Friday, 23 August 2024 12:05 (20 minutes)

LIGO/VIRGO/KAGRA collaboration announced over 90 gravitational waves detections from double compact objects (DCOs) mergers, however, the origin and evolution scenario of their progenitors remains elusive.
One of the promising candidates for DCOs progenitors are the X-ray binaries (XRBs) where X-ray emission arises from the accretion of matter transferred from the companion star onto a black hole (BH) or a neutron star (NS).
To study the connection between XRBs and DCOs mergers we chose the spiral galaxy M83 which hosts 214 X-ray point sources identified as XRBs. Only 12 of them are found within stellar clusters while for the remaining 202 the formation site cannot be definitely indicated. Had they formed through the isolated binary evolution or the dynamical interactions in the stellar clusters remains an open question.
Regardless how they were formed, one can investigate what will be the final fate of the XRBs observed in M83. For that purpose we used the population synthesis calculations. We reproduced the number and X-ray luminosity of XRBs in M83 within isolated binary evolution model. We then followed the evolution of each XRB in the model population until the merging DCO was formed or the Hubble time was reached (if the merger didn't appear). Our results show that although all merging DCOs in our isolated binary evolution model go through the XRB phase only $\sim 1-2\%$ XRBs in M83 may evolve to form merging DCOs.

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Session Classification: Chris Belczynski memorial session on compact objects and gravitational wave sources