ID de Contribution: **4** Type: **Contributed talk**

X-ray active lifetime of BH+O binaries - implications for natal kicks of black holes

jeudi 11 mars 2021 15:50 (18 minutes)

Within a few kiloparsecs around the Sun, we have access to a complete sample of ~20 Wolf-Rayet+O-star binaries. On the other hand, only one BH+O binary, Cygnus X-1, is detected in the solar neighbourhood thanks to the X-ray emission produced by the wind accretion process. If the former binaries are the progenitors of the latter, this discrepancy can be explained either by large natal kicks at BH formation which disrupted most binaries or by short X-ray active lifetimes.

In this talk, I will present new results on the fraction of time BH+O binaries spend emitting X-rays at a detectable level. We evolved the sample of observed Wolf-Rayet+O binaries up to the collapse of the Wolf-Rayet star into a BH. Assuming a zero natal kick, we continue the evolution of the binary and monitor the moment when conditions are matched for a formation of a wind-captured disk around the BH and for an X-ray emission detectable within a few kiloparsecs. We find that the formation of accretion disk is very sensitive to the wind velocity of the O star companion. With revised values for the wind speed thanks to an accurate description of the line-acceleration, we find little to no X-Ray active lifetime for the BH+O star systems. It implies a large reduction in the predicted number of observable wind-fed high-mass X-Ray binaries hosting a BH and an O-star compared to what was recently found by Vanbeveren et al. (2020). High natal kicks or direct collapse of the Wolf-Rayet star into a neutron star are thus not necessary to reproduce the scarcity of systems like Cygnus X-1 in the solar neighbourhood.

Auteur principal: EL MELLAH, Ileyk (IPAG - CNRS)

Co-auteurs: M. SEN, Koushik (Bonn); M. XU, Xiao-Tian (Bonn); Prof. LANGER, Norbert (Bonn); M. SCHÜRMANN, C. (Bonn); M. QUAST, Martin (Bonn)

Orateur: EL MELLAH, Ileyk (IPAG - CNRS)

Classification de Session: Source catalogues and cross-identifications