Talk at Splinter Meeting

Splinter I

A spectral analysis of the Wolf-Rayet binaries in the Small Magellanic Cloud

T. Shenar[1], H. Todt[1], R. Hainich[1], A. Sander[1], W.-R. Hamann[1], A. F. J. Moffat[2], D. Pasemann[1]

[1] *Institut für Physik und Astronomie, Universität Potsdam, Karl-Liebknecht-Str. 24/25, D-14476 Potsdam, Germany*

[2] *Département de physique and Centre de Recherche en Astrophysique du Québec (CRAQ), Université de Montréal, C.P. 6128, Succ. Centre-Ville, Montréal, Québec, H3C 3J7, Canada*

Wolf-Rayet stars are evolved stars characterized by powerful, radiation-driven stellar winds. Massive stars reach the Wolf-Rayet phase after having shed enough material to approach the Eddington limit, either via stellar winds or via mass-transfer in binary systems. A significant fraction of the known Wolf-Rayet stars are found in short period binary systems. It is inevitable that the companions of such systems would interact via tidal disruptions, mutual irradiation, and mass-transfer. The fact that such systems are common raises the question as to the impact of binary interactions on the evolution of Wolf-Rayet stars. Specifically, it is expected that in low metallicity environments the frequency of single Wolf-Rayet stars diminishes. Thus, for instance, in the low metallicity environment of the Small Magellanic Cloud, almost all Wolf-Rayet stars are expected to reside in binary systems. This, however, has not been confirmed observationally, and the contribution of binary systems to the total number of Wolf-Rayet star in the universe is far from established.

To help gain insight on this problem, we performed a spectral analysis of the five confirmed Wolf-Rayet binaries in the Small Magellanic Cloud. In my talk, I will present the results of the analysis, focusing on their evolutionary state and on possible systematic differences between the binary and single Wolf-Rayet stars.