Why Boron clusters are Planar? KIRAN BOGGAVARAPU, ANIL KANDALAM, McNeese State University — The origin of the unusual stability of planar and quasi-planar B12 and B13+ clusters is explored. Our results demonstrate that in B12 and B13+ clusters a \(6\sigma_{-6\sigma_{-delo}}\cdot6\sigma_{-3\text{ring}}\) trifurcation leads to the triple aromaticity, which is unique to these clusters. Most importantly, the H-L gaps of these clusters are strongly dependent on the strength of the interaction between the inner- and the outer-rings, which make up these clusters. Furthermore, the similarities and the differences between B12 and other stable boron species, B10 and B14 clusters are also discussed. The implication of the current analysis is discussed with respect to Carbon, Silicon and Aluminum clusters.