In this colloquium we review the general aspects related to low dimensional nanocarbons (sp2 and sp bonded carbons) and their roles as model systems in nanoscience and as important building blocks for nanotechnology. The goal is to make a comprehensive account of some of the unique physical properties of carbon layers, tubes and chains as a function of curvature, symmetry and reduced dimensionality. Emphasis will be given to electronic and vibrational properties of these materials that can be precisely probed by using resonance Raman spectroscopy owing to strong and selective electron-phonon coupling. If time allows, we shall discuss some issues related to a new field inspired by graphene and that is now broadly known as the "beyond graphene" science.