

## SWCNT functionalization: from molecular electronics to (bio)sensing applications

Single walled carbon nanotubes (SWCNTs) have attracted interest during the last decades due to their exceptional electronic properties. Notably, they can be functionalized through different ways and incorporated in a device configuration to develop new electronics. I will talk about the work performed during my PhD and Postdoc related to the modification and implementation of these nanotubes for the development of gas and bio-sensors. First, SWCNTs have been incorporated on microcantilevers as a sensitive layer for gas sensing application. A continuity of this work was to functionalize the SWCNTs with a molecular receptor (deep cavitand) in order to recognize selectively Benzene vapors. Then, SWCNTs have been wrapped with DNA making them soluble in water and solution processable. By functionalizing their side wall with different aptamers that can selectively bind target molecules, a biosensor has been developed for the recognition of biomarkers responsible of neuro-trauma conditions in human body. Finally, a new route to form molecular junctions between two SWCNTs ends has been performed using aryl diazonium reduction in a single step.