**Fabio Di Pietrantonio**

**Institute for Microelectronics and Microsystems (CNR)**

**Micro-fabricated devices based on piezoelectric and innovative materials for microelectronics and sensor applications.**

Micro-fabricated devices are currently used in several applications such as consumer electronics, signal processing, wireless communications, sensors, and many others. The activity of the pMEMS Group of the Institute for Microelectronics and Microsystems is focused on micro-fabrication and testing of a wide range of devices and sensors based on piezoelectric materials and innovative materials. For example, electronic noses based on chemoselective polymers or Odorant-binding Proteins have been implemented by using matrices of Surface Acoustic Waves micro-sensors for detection of small concentrations of volatile species with high selectivity. In order to further increase the sensitivity of micro-sensors, Film Bulk Acoustic Resonators (FBARs) based on both suspended membranes or Bragg reflectors have been fabricated by using piezoelectric thin films (AlN, ZnO) grown by rf magnetron sputtering. FBARs are used not only for the implementation of sensors and biosensors, but also for the development of rf filters. As regards microelectronic devices for space applications, MESFETs and novel V2O5 based MISFETs on hydrogen-terminated (H-terminated) single crystal diamond film were fabricated and tested. Furthermore resistive switching devices were fabricated in order to investigate the room temperature ambipolar diffusion of oxygen vacancies and electrons in pure CeO2 and 20% Sm-doped CeO2 films.