



DIPARTIMENTO DI ELETTRONICA
Università degli Studi di Pavia

AVVISO DI SEMINARIO

**Silicon Radio-Frequency Biosensor Utilizing Nuclear
Magnetic Resonance:
Circuit Designer's Approach to Early Disease Detection**

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Abstract: A recent work that showcases how silicon RF chips can be used not only for cellular phones, but also for biosensing aimed at early disease detection in direct interface with biological systems, will be presented. The main function of our silicon RF chip is to manipulate and monitor the motions of protons in water via nuclear magnetic resonance (NMR). Target biological objects such as cancer marker proteins, along with specially engineered magnetic particles, can be made change the motions of the protons, which is the basis for our biosensing. The RF chip has a very high sensitivity, which made possible our construction of an entire NMR system around the RF chip in a 2-kg portable platform, which is 60 times lighter, yet 60 times more sensitive than a state-of-the-art commercial benchtop NMR system. Sensing one protein molecule in 40 trillion water molecules, our system is a circuit designer's approach to pursue early disease detection and improved human healthcare.

Lunedì 10 Novembre, ore 11
Sala conferenze c/o INFN - Studio di Microelettronica
Via Ferrata 2

Tutti gli interessati sono cordialmente invitati.