

Extended Abstract

# Wearable Piezoelectric Sensor Technologies for Health Monitoring <sup>†</sup>

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**Abstract:** The combination of micro- and nano-technologies with micro-mechanic, photonic, electronic and (bio)chemical approaches is producing completely new, compact and effective tools for diagnostics and therapeutics, which can be disposable, wearable, implantable or tattooable. These new technologies are opening the way to closed loop theranostics, i.e., device integrating advanced sensing and diagnostic capabilities and therapeutic response. In order to enable these new class of transducers for continuous and real time health monitoring, ultrathin and compliant non-intrusive smart technologies are required.

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In this talk piezoelectric body sensors based on biocompatible, ultra-thin and flexible Aluminum Nitride (AlN) will be discussed. The sensors can be conformally wrapped around any curved surface, including skin, organs and prosthesis, thanks to their very thin and flexible polymeric substrate. The extreme compliance and flexibility make the transducers effective in producing charges and signals also from imperceptible mechanical movements, such as the blood flow in arteries under the skin. It will be shown that piezoelectric wearable and implantable technologies can be successfully applied for both sensing and energy harvesting on the human body for self-powered body sensors and for the internet of healthy things (IoHT).



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