



**Ben-Gurion University of the Negev
Blaustein Institutes for Desert Research**

The Swiss Institute for Dryland Environmental and Energy Research
Alexandre Yersin Department of Solar Energy and Environmental Physics

Selective Molecular Sensing using CMOS Compatible Nanowire Transistors

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Abstract:

For the past several decades, there is a growing demand for the development of low-power gas sensing technology for the selective detection of volatile organic compounds (VOCs), important for monitoring safety, pollution and healthcare. We present the selective detection of various VOCs using the electrostatically formed nanowire (EFN) transistor without any surface modification of the device. Selectivity towards specific VOC is achieved by training machine-learning based classifiers using the calculated changes in the threshold voltage and the drain-source on current, obtained from systematically controlled biasing of the surrounding gates (junction and back gates) of the field-effect transistors (FET). Specific biasing of the device has recently shown superb sensitivity to Ammonia and other molecules under very high humidity conditions. This makes the EFN platform a selective sensor, working under ambient conditions and room temperature, which is suitable for mass production and low-power sensing technology.

Date & Location:

Tuesday, January 21, 2020, 11:00

Lecture room, Physics Building (ground floor)