

# **Seminář odd. 26**

## **Tenkých vrstev a nanostruktur**

*Fyzikální ústav AVČR, Cukrovarnická 10, Praha 6*

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*mítnost: knihovna, budova A, 1.p.*

### **TÉMA**

## **DNA detection using graphene and diamond**

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DNA is a nucleic acid molecule encoding genetic information, which has a vital role for the development and functioning of all known living organisms. Despite the long and rich research into DNA, fast and reliable DNA sequencing and detection of low concentration of DNA in physiological conditions are still problematic. In this talk I present two different strategies for detection of DNA using graphene and diamond-based devices. I demonstrate that graphene field effect transistors (GFETs) are capable of detecting distinct conductance signatures upon adsorption of the four different DNA nucleobases, providing a first step towards graphene-based label-free DNA sequencing. Then I show a new nanoporous diamond-based sensor for ultrasensitive and selective detection of circulating DNA from blood down to the single-molecule level. This detection method is in particular suitable for non-invasive diagnostics and early detection of cancer and other diseases.

odborný garant: *RNDr. Antonín Fejfar, CSc.*