University of Crete
Department of Physics

40 Years Anniversary Colloquium Series

Thursday, 22 November 2018 | 17:00 – 18:00, Seminar Room, 3rd floor

Holes in materials and their relevance in biosensing

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ABSTRACT

Solid-state nanopores, that are nanometer-sized openings in materials, have shown a great potential in sensing biomolecules. Through these openings, DNA, RNA or proteins, can be electrophoretically driven giving rise to ionic and electronic current signals. In this talk, the underlying physics guiding the translocation process of molecules through pores will be presented. Together with the state-of-the-art in the nanopore field, focus will be given on the information obtained through simulations of the translocation at different spatial and temporal scales. Accordingly, details on the translocation process, its statistics and dynamics, folding events in the pore, and the influence of the solvent will be highlighted. Various aspects of the sensing possibilities will be underlined through the use of different material types, silicon-nitride, 2D molybdenum-disulfide, and functionalized nanopores. In the end, the relevance of nanopores for realizing novel ultra-fast and low cost DNA sequencers and the potential for optimizing nanopore biosensing will be discussed.

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