

**Hermes Partnership workshop on**

**Nano Communication and Technology for Autonomous, Ultra Miniature, Ultra Low Power, Multi-Functional Wireless Systems**

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**Abstract of presentation of Dimitry Penkin, TU Delft**

**Title: A study on performance of RF channel between ultra miniature devices composed of up-to-date components**

Micro-electromechanical systems (MEMS) and nano-electromechanical systems (NEMS) have become an important area of research in the past few years. In particular, to date a thrilling field to study is a "smart dust" concept: a "smart dust" mote is a very small chip, which has the ability to sense, communicate and be self-powered. In general, a miniature, low-cost sensor motes swarming in a network can strongly increase a sensing performance of existing applications as well as be an enabler to reach a set of new dramatic applications (e.g., in-vivo ones) in practice. However, creating the aforementioned network researchers have faced with a number of formidable challenges, which require a search of breakthrough solutions to eliminate them. In this presentation we outline and describe these key challenges: for instance, a need to take into account strong statistics of the channel between two motes or to develop a novel network protocol for the swarm of such motes. Eventually, a calculation of the crucial "mote" issue is presented as well indicating numerically the gap between capabilities of energy component and power consumption of other components of a mote.