

UNL Department of Physics and Astronomy presents:

# Mens Agitat Molem: The Age of Intelligent Materials

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**THURSDAY**  
**APRIL 21**  
**4:00 PM**  
**IN JH 136**

Refreshments will be served in the JH 1st Floor Vending Area at 3:30

## ABSTRACT

The age of IoT, the internet of things, the age of extremely interconnected cyberphysical systems, can only be achieved by disruptively new ToI, Things of Internet. Such “things” should be able to sense, act and decide depending on the environment they find embedded in: Modern nanofabrication and nanoimaging tools already allowed for discoveries of a huge number of new functional nanomaterials capable to sensitively change their conductance in the proximity of charged analytes. This would lead to highly personalized diseases diagnostics and ubiquitous environmental monitoring addressing a few societal challenges ahead related to human life in a strongly globalized world. Nanoparticles, nanowires, 2D materials are dominated by quantum effects and employing them as active elements in transducers for novel devices opens enormous perspectives for innovative molecular sensor systems. After an introduction of the fundamental sensing mechanisms of nanomaterials-based devices, I will present innovative design and fabrication strategies for our sensor elements. The close interaction of simulation and experiment allows us to elaborate tailored, but also transferable, technological functionalization strategies for different analytes to cover a wide range of application scenarios. The results of our research prove the vast potential of designing tools capable of multiplexed read-out towards unprecedented highly selective and picomolar sensitive molecular detection.