

LAEDC Session X: Device Physics II**8:30 – 10:00, Vento 3 Room****Demo 3: Maker prototyping techniques for a development a low cost electrospinning machine .****Javier Carvajal Artavia, Bryan Salazar Ramírez and Hugo Sánchez Ortiz****10:00 – 10:30, Acqua Hall.**

Electrospinning fiber production is a well-studied method to create nanofibers by electrical forces. Depending on their chemical, physical and mechanical characteristics, they have a wide range of applications as: medicals applications, polymers for batteries, textile industry and others. However, the actual cost for the machine to create these fibers is high, making the acquisition of this equipment complicated for experimentation. This demo will present the application of Maker prototyping techniques for the development of a low cost electrospinning machine that operates between 5kV and 30kV, designed and fabricated by the company ImagineXYZ.

Keynote Speaker:**Christian Schuster, Hamburg University of Technology, Germany.****Talk: Artificial Neural Networks for EMC Engineering.**

Artificial Neural Networks – in short: ANNs – are one of the many methods used nowadays in Machine Learning (ML). Their fundamental development has spanned many decades and they have found widespread use in such areas as image and speech recognition as well as autonomous driving. Despite this success, ANNs have not been applied routinely to complex engineering task such as guaranteeing the Electromagnetic Compatibility (EMC) of electrical and electronic components and systems. In this talk – a after a short, layman’s introduction into ML and ANNs – we will look in some detail at the current state of art in the application of ANNs to EMC engineering including an example from power delivery network design that we worked recently on at TUHH. A personal outlook will conclude the presentation.

Keynote Speaker:**Wouter Serdjin, Delft University of Technology, The Netherlands.****Talk: The Medicine of the Future You'll Take Only Once, and it is Bioelectronic.**

The 21st century will be the century in which we will unravel the intricacies of the brain and the rest of our nervous system and in which we will learn how to interact with our electrochemical mainframe better by means of electricity, light or ultrasound. Tiny electronic devices will give us back lost senses, lost control, bypass lesions and treat an unprecedented range of brain disorders, thereby bringing back quality of life to the deaf, the blind, the paralyzed and the mentally disturbed. This talk will address how these ‘bioelectronic medicines’ do this, what they look like and which future circuit and system developments are needed to make them a reality. We will discuss their constraints on size, their energy challenge, their adherence to the body and their security aspects. We will also discuss how to make them truly personalized, so that they gracefully adapt to your therapeutic needs and you truly will feel better.