

## Plenária PL4

# Electrical DNA detection using graphene extended defect device

Rodrigo Garcia Amorim\* (UFF)

### **Abstract:**

The topological line defect in graphene comprises an extended defect of octagons and pentagons in a specific direction. We can use this fact to modulate the electrical current and also as a solid-state resistive sensor. Here, using Density Functional Theory, in combination with non-equilibrium Green's functions we investigate the octagon-pentagon (OP) defect and its electronic and transport properties. Firstly, we study individual defects and how the pristine electronic and transport properties are affected by them. Secondly, with the previous finding we designed a device using the modulation principle. The proof of concept of the device was made using DNA as a target molecule and also compared the system in dry and wet conditions. The results reveal good nucleobase sensitivity discrimination and translocation times. Our findings demonstrate that the proposed device is a good candidate to be applied as a biosensor.

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\*E-mail: rgamorim@id.uff.br