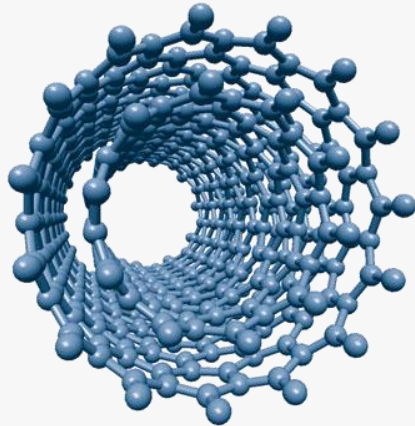




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RESEARCH

# Synthesis of Carbon Nanotubes



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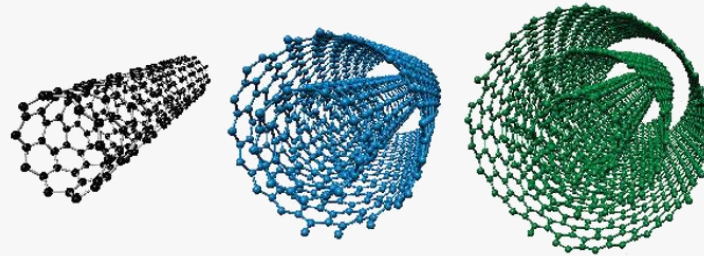
Prof. Edgar Caetano Fernandes

20<sup>th</sup> September, 2019

# Motivation and Context

*Carbon nanotubes (CNTs) take part in our daily life:*

**CNTs** are tubes made of carbon with diameters in the range of a nanometer. These cylindrical carbon molecules **have interesting properties** that make them potentially useful in many applications in nanotechnology, electronics, electrochemical devices or gas sensors.



High cost of production to CNTs synthesis!

The challenge - Make it:



**Produce CNTs from sustainable and scalable synthesis with alternative and sustainable fuel (biogas)**



# Objective

Design and produce CNTs in a sustainable way which can be used in advanced **NH<sub>3</sub> gas micro-sensor** for environmental monitoring at room temperature.

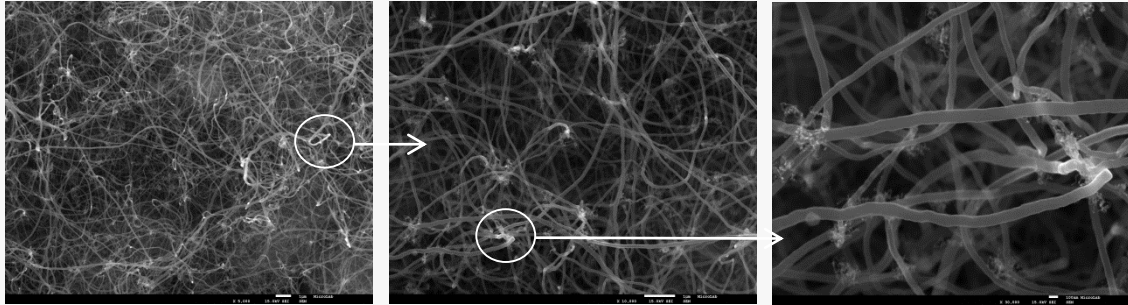
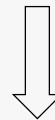


Figure 1: Scanning electron microscopy micrographs for first CNTs morphology obtained by **flame synthesis** in Laboratory of Thermofluids, Combustion and Energy Systems.



**Why?**

**NH<sub>3</sub>** has now accepted as the possible **fuel of the future** [1].