

Master project in “**Nanomaterials and energy storage**” research group.

<https://www.umu.se/forskning/grupper/nanomaterials-and-energy-storage/>

Currently active projects:

- Synthesis and characterization of porous carbon materials based on **graphene** and other 2D materials (graphene oxide, Mxenes, COFs etc)
- Applications of porous materials as electrodes in supercapacitors
- Liquid dispersions of high surface area materials for spray deposition of supercapacitor electrodes (in collaboration with international industry, THALES)

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Subject of Master Thesis:

### “**Conversion of waste natural bioproducts into activated carbon with ultra-high surface area.**”

Chemical treatment of natural biomaterials (e.g. coconut shells) allows to synthesise Activated Carbon (AC) with extremely high surface area of about 3000 m<sup>2</sup>/g. That is about the area of football field in 1 gram of material. The project suggests to use natural materials highly abundant in Sweden’s forests instead of coconuts. What is usually considered as a waste in forest industry can be converted into valuable AC materials with many possible applications: electrodes in energy storage devices, removal of pollutants, paints etc.

If you like to work in laboratory and not afraid to make your hands dirty, there is a chance to contribute to better utilization of Scandinavian forest industry waste. The project does not require special prior knowledge. You will learn how to convert natural biomaterials into carbon powder, perform chemical activation, learn how to measure surface area and participate in testing materials in supercapacitors. The research work will be a part of the project, which might result in publication in international journal.

