

## Research Topics for Doctorate in Science & Technologies of Chemistry & Materials, curriculum in Nanochemistry

### Research Topics

1. From macro- to micro-batteries..... 1
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#### 1. From macro- to micro-batteries

##### Tutor

Remo Proietti

##### Description

Tremendous efforts have been done in the last decades towards the development of highly efficient secondary batteries. Li-ion batteries, with their well-established fundamentals, do represent a very viable energy storage solution, surely very safe and characterized by affordable cost. Here, we aim to extend the operational scenario of secondary batteries to the micro-world by establishing a route for the realization of micro-batteries through top-down fabrication techniques. The final goal is to approach the battery design and construction by following an engineering vision, in opposition to the more stochastic chemical approach. The adopted chemistry will be based on lithium-ion solutions although an extension towards lithium-sulphur chemistry will be carefully evaluated.

The experimental activity will be run within the DELTA Lab of the Italian Institute of Technology, where state of the art instruments both for synthesis, fabrication and characterization will be at disposal of the candidate.

##### Requirements

The candidates should have an experimental background in electrochemistry, material science, chemistry or physics with possibly some experience in battery preparation and analysis. Importantly, candidates should be driven by strong work dedication. Work experience in the theoretical design of a battery will be positively considered.

##### Contact

[remo.proietti@iit.it](mailto:remo.proietti@iit.it)

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