

## **Fabrication and characterization of nanostructures for thermoelectric applications**

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This lecture will focus on the fabrication processes and on the morphological, thermal and electrical characterization of nanostructures and nanomaterials which are suitable for thermoelectric applications.

In the first part of this lecture the advantages of the use of nanostructured materials for thermoelectric conversion will be enlightened. In particular, the reduced thermal conductivity of nanostructures opens the possibility of exploiting materials, such as silicon, which are cheap and sustainable but which have a high thermal conductivity in their bulk status.

In the second part we will describe the main top-down fabrication techniques for the production of nanostructured materials, giving particular emphasis to silicon.

In the last part, techniques for the morphological and electrical characterization of nanostructured devices will be described. A particular focus will be given on the advanced characterization techniques for the measurement of the thermal properties, and in particular of the thermal conductivity, at nanoscale.