

## Nanoparticles for Energy

From nanoparticles synthesis to controlled energy conversion on small scales –  
Application to hyperthermia

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Nanomaterials and nanoparticles have sparked intense research activities for decades and cover different fields, going from the most fundamental interests (in chemistry and physics), to the most concrete applications (in medicine, in process and engineering sciences). This mini-symposium aims to bring together these different communities under the prism of applications linked to energy, such as hyperthermia (magnetic or plasmonic) and to take stock of advances in the field.

The control of the spatio-temporal temperature profile in hyperthermia requires a detailed understanding of the underlying phenomena, ranging from the intrinsic properties of the isolated nanoparticle to the emergence of collective effects of the assembly of nanoparticles in a matrix. To this end, it is essential to determine the most suitable chemical synthesis to have a hand on the size, and shape of the nanoparticles, as well as the overall organization of the assembly. Likewise, the role of collective effects due to long-range interactions deserves to be clarified and remains a major issue both theoretically and in experimental developments to characterize its implications. The “Nanoparticles for Energy” mini-symposium will address the following questions in particular:

- How to control the nanoparticles' shape and size during synthesis?
- How to disentangle intrinsic contributions and collective effects in nanoparticle assemblies?
- What are the most relevant and reliable observables to determine conversion efficiency? How to implement them?

**Answering these questions implies that this mini-symposium necessitates bringing together the communities of chemists, solid-state physicists and energy scientists.**