



Nanobio Spectroscopy Group and ETSF Scientific Development Centre
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Questions Nanostructural Properties (Master in Nanoscience 2013-14)

Please provide a detailed answer to the following questions and send them to me (angel.rubio@ehu.es) before the end of February

1. *Optical versus electron spectroscopies: which quantities can be access and how they can be complementary.*
2. *Describe a general time dependent pump-probe spectroscopy. Determine some quantities that can be directly measure and how they can be linked to specific response functions*
3. *Heat versus electron transport: analyze the concept of thermoelectricity at the nanoscale. What is the figure of merit of a thermoelectric material? How nanostructured materials can help in improving it?*
4. *How going to the nanoscale could help in your opinion to improving the mechanical response of materials or the design of new molecular-based materials.*
5. *Please provide an analysis of the following homework on Simple models of conjugate polymers see http://nano-bio.ehu.es/files/hw_assignment.pdf*