

Wednesday, February 07, 14:00-15:00

Physics Department - H Block Seminar Hall (Tea & coffee at 13:45)



Electromagnetic properties of magnetic nanoparticles under thermal deformations

(Image credit: <https://nano-magazine.com/news/2019/2/14/what-happens-to-magnetic-nanoparticles-in-cells>)

In the first part of our presentation, we will make a brief introduction to the magnetic behavior of magnetic nanoparticles (MNPs) in a wide temperature range. We will discuss dipole-dipole interaction between MNPs and compare electromagnetic properties of MNPs depending on their synthesis method.

In the second part, we will present experimental results obtained using electron spin resonance spectroscopy technique at 4.2-300 K, focusing on ferrite spinel and lanthanum strontium manganese oxide MNPs. We will discuss thermal deformations of core-shell MNPs.

In the final part, we will give a short overview of the practical applications of MNPs in medicine and technology.

Keywords: magnetic nanoparticles, ferromagnetic resonance, millimeter and centimeter waveband, magnetic and electromagnetic properties, magnetic anisotropy, low temperatures.



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Kateryna Sova obtained her Ph. D. in 2023 in Physics and Astronomy from O.Ya. Usikov Institute for Radiophysics and Electronics of NAS of Ukraine (Kharkiv, Ukraine). She worked at O.Ya. Usikov Institute for Radiophysics and Electronics of NAS of Ukraine at the Radiospectroscopy Department. Currently, she works at Gebze Technical University. Her research interests include radiospectroscopy of magnetic nanoparticles and thin films, quantum conversion systems.