nanoSeminar Series 2022

Institute for Materials Science

Dr. Elena Diaz

Materials Physics Departament, Universidad Complutense de Madrid

Biosensors based on upconversion nanoparticles

Thursday, July 21st 2022
13:00 – 14:00

Normal: Seminar Room 115, Hallwachsstr. 3 (HAL)
Pandemic version: https://tinyurl.com/nanoSeminar-GA

The design of new heterostructures based on several optically active nanoparticles that get assembled due to the presence of short sequences of nucleotides as those expressed in a viral processes like the so called miRNAs, has a huge potential in bionanotechnology to detect certain infections. This approach allows us to design biosensors as molecular switchers whose functioning (on or off) depends on the presence of the miRNA in the biological sample. The efficiency of these biosensors is closely related to the proper selection of the nanoparticles (fluorescent, metallic, quantum dots…) acting as donors and acceptors within the heterostructure.

In the last years upconversion nanoparticles have acquired a lot of attention in this regard due to their optical and chemical properties. In this seminar some proposals of biosensing platforms based on upconversion nanoparticles will be discussed.

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Elena Díaz García has been hired as lecturer and researcher at the University Complutense of Madrid since 2007, being tenured professor since April 2019 at the Materials Physics Department, where in addition she currently holds the position of Academic Secretary.

She finished her physics Bachelor in 2005 and her physics phd in 2009 with her Thesis titled “Optical and transport properties of complex molecular systems”. In both cases she was awarded with extraordinary distinctions of her promotion. Her predoctoral training was completed with several research stays in well-recognized institutions as the University of Bayreuth (Germany) , University of Groningen (The Netherlands) and Duke University (NC-US). After her Phd she worked as a postdoctoral researcher for 18 months at the Technische Universitaet in Dresden (TUD, Germany) where her studies were devoted to the study of the energy and heat transport in helical molecules. The collaboration with the TUD continued within the frame of an Integrated Project Spain- Germany that was led by Dr. Díaz.

She accounts with 41 articles published in well-recognized peer-review journals, some of them of particularly high-impact: Physical Review Letters, Optics Letters, Journal Physical Chemistry Letters or Nanoscale. She also managed to acquire financial support from regional, national and european sources.

On the other hand more than 20 bachelor and master students have been tutored by Dr. Díaz with great success. Among them it’s worth noticing the Doctoral Thesis of Alvaro Díaz Fernández titled "Reshaping dirac cones by Floquet engineering" defended in 2019 that has been awarded by the Springer Theses program.

Most recently in June 2021, Elena Díaz García got the positive qualification aprofessor by the spanish national agency ANECA.

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