

Project 4.7 Relation between physical properties and atomic structure of bundles of carbon nanotubes filled with magnetic halide phases

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Unit: SL 1.4

www: <http://www.ifpan.edu.pl/SL-1/html/s-s114.html>

Background:

The project is devoted to the advanced molecular scale structures, consisting of bundles, 2D and 3D networks of aligned carbon nanotubes filled with highly crystallographically aligned magnetic halide phases. Due to the pressure of the walls of the nanotubes, the classic limits of thermodynamics of crystals can be exceeded using this type of approach. We assume that the cleaned, refined and oriented filled nanotube bundles will create magnetic 2D and 3D superstructures which will have unusual magnetic properties.

Aim:

The project, will be carried out in the frame of NCN project “In-situ TEM determination of the structure and nanomagnetism of bundles of carbon nanotubes filled with aligned magnetic phases” performed in scientific cooperation with the University of Warwick (Prof. Jeremy Sloan group <https://warwick.ac.uk/fac/sci/physics/staff/academic/jsloan/>).

Reserch program concerns, investigation of atomic structure of single walled carbon nanotubes (i.e. SWCNTs) filled with transition metals halides, using advance transmission electron microscopy methods coupled with numerical modeling. In following, linking this atomic structure with magnetic and optic properties of such nano-structures .More information about NCN project can be found <https://ncn.gov.pl/sites/default/files/listy-rankingowe/2021-03-15bhga1/streszczenia/523873-en.pdf>

Requirements:

- the master degree in physics or chemistry or material science or similar domain ,
- sufficient proficiency in English,
- knowledge about the crystal structure of nanostructures,
- programming skills in one of the languages: Payton, C++ or similar,
- the ability to use the transmission electron microscope is an additional advantage

Funding:

e.g. Scholarship: grant funding of 5000 PLN per month, before subtracting obligatory employer and employee social security contributions (~15%), for 45 months. Afterwards, standard Polish PhD scholarship (3240 PLN/month net in remaining part of 4th year).

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Application details:

Application deadline: 04.06.2022. Applications after the deadline are not considered.

Required materials:

- M.Sc. diploma,
- Curriculum Vitae
- recommendation letter or e-mail to supervisor of M.Sc.,
- list of publications,
- motivation letter,
- consent to process your personal data (expressed on the form attached to this announcement).