



# Institute of Physics of the Polish Academy of Sciences

## Scholarship for a PhD Student



Job ID: #JOB 31/2020

### Job Description

#### Job Title: PhD Student –scholarship holder

Experimental studies on magnetic structure of inherently laminated MAX phase magnets.

#### Job Description:

The student will join the Nuclear Magnetic Resonance Laboratory in the Division of Physics of Magnetism in the Institute of Physics Polish Academy of Sciences. He/She will work on the project “Magnetic structure of the inherently nanolaminated MAX phase magnets – NMR study “ funded by National Science Center (Narodowe Centrum Nauki – NCN).

Novel, inherently nanolaminated magnetic materials from the MAX phase family  $M(n+1)AX_n$  (M is a transition metal, A is an A-group element, and X denotes carbon or nitrogen) can potentially lead to the fascinating phenomena similar to those observed in the artificially prepared multilayers, such as oscillatory magnetic coupling, giant magnetoresistance, tunneling magnetoresistance, exchange bias, perpendicular anisotropy, magneto-electric coupling etc. In order to control their magnetic behavior and design new magnetic compositions it is essential to understand the complex magnetic interactions between elements forming these quasi two dimensional structures.

The PhD project aims at defining the magnetic structure in a number of nanolaminated MAX phase ( $M_{n+1}AX_n$ ) thin films derived from  $Mn_2GaC$ . To determine the type and strength of magnetic interactions within the magnetic M(Mn, Cr, V) layers and between them (across the A and X layers, respectively) the Nuclear Magnetic Resonance (NMR) techniques will be used. The NMR experiment will be performed in zero field and in presence of the external magnetic field up to 6 T applied in different orientations with respect to the film geometry.

#### Requirements:

- M.Sc. degree in Physics (solid state physics) (or an equivalent that qualifies one for PhD studies in physics in the country of issue).
- Good command of the English language.
- Ability and interest to work in a team.
- Knowledge of the programming C language.
- Some experience of working in experimental laboratory environment.
- To be employed, the candidate must be accepted into the PhD school co-organized by the Institute of Physics . Applications for the advertised PhD position should be made , online at <http://warsaw4phd.eu> .

**Main research field:** Physics

**Sub Research Field:** Solid State Physics/Physics of Magnetic Materials,

**Career Stage:** Early stage researcher or 0-4 yrs (Post-graduate)

**Research Profile** ([details](#)): First Stage Researcher (R1)

**Type of Contract:** Fixed term (45 months)

**Status:** Full-time

**Salary: 5000 PLN** per month (grant funding, before obligatory employer and employee social security contributions).

## Contact

More information can be obtained from  
Marek Wójcik (e-mail: [wojci@ifpan.edu.pl](mailto:wojci@ifpan.edu.pl))  
Please make contact.

## Application details

**Application deadline: August 18<sup>th</sup> 2020** Later applications will not be considered.

### Required materials:

- Scientific CV
- Cover letter
- Scan of MsC diploma or equivalent (or an explanation of when one is expected)
- Academic record (for finalized semesters)
- Recommended: A recommendation letter by an academic, or their contact email.

All materials should be submitted in electronic form by application to the PhD school <http://warsaw4phd.eu>, choosing the project: "*Magnetic order in nanolaminated MAX phases based on Mn<sub>2</sub>GaC*". (The application system will be active from August 05<sup>th</sup> 2020 until August 18<sup>th</sup> 2020 ).

Results regarding the position will be made available by September 18<sup>th</sup> 2020.  
iki konkursu o stanowisko zostaną ogłoszone do 18 września 2020 r.