AGH University of Science and Technology, KRAKOW, POLAND
UNESCO CHAIR FOR SCIENCE, TECHNOLOGY AND ENGINEERING
EDUCATION AT THE AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY
KRAKOW, POLAND
A. Mickiewicza Ave 30, PL 30–059 Krakow, Poland
E-mail: unesco@agh.edu.pl

UNESCO AGH Fellowships ed. 2012-B in Engineering
Project Proposal 6 months

Naukowa oferta stypendialna UNESCO - AGH 2012 B dla młodych naukowców z krajów rozwijających

UNESCO - AGH 2012 Project B: promoting human resource capacities in the developing countries through intensive training and to enhancing international understanding and friendship among peoples of the world and the people of Poland

(In English)

1. Project title: *Studies Magnetostriction\In Stoichiometric and Doped Magnetite Single Crystals*
Field of research: *Solid State Physics*
Number of fellowships with free tuition sponsored by UNESCO: 1

2. Name of institution: *AGH University of Science and Technology,*
Faculty of Physics and Applied Computer Science
Full address: *A.Mickiewicza Av. 30, PL 30-059 Krakow, Poland*

3. Name, title and full contact data of project supervisor:
prof. dr hab. inz. Andrzej Kozlowski, prof. dr hab. inż. Zbigniew Kąkol
Tel.: +48 12 617 2006
E-mail kozlow@agh.edu.pl, kakol@agh.edu.pl
www.agh.edu.pl

4. Project duration: 6 months
Proposed starting date: 1.10. 2012 /exact date to be agreed upon by the selected fellows and host Institution/
Language: English
Scientific contents: *individual research programme under supervision of tutor* (see next page p.8)

5. Developing countries (specification): *UNESCO Member States please specify if any*
Africa, Asia, Latin America countries

6. Academic requirements: *Candidates should have a B.Sc. or M.Sc. degree in Physics or Technical Physics,*

7. Qualifications required: *be proficient in reading and writing in English;*

be not more than 40 years of age; and be in good health, both physically and mentally;

project description optional:
The project is to study magnetostriction in magnetite-based single crystalline materials in order to see how large the interaction of magnetic moment with the lattice is and if magnetism can participate in the interactions leading to the Verwey phase transformation at T_V =120K. Crystal lattice dynamics was already shown to influence this transition. In case the strong spin-lattice coupling is present then any change in magnetism of magnetite could affect crystal structure, i.e., ultimately, the transition. The possible finding of this effect would constitute a real breakthrough in the science of magnetite since the most common opinion is that the magnetic degrees of freedom do not participate in the interactions leading to the transition. In addition to that problem, the results of magnetostriction measurements will help to better understand our recent measurements of magnetic axis switching phenomenon.

R&D results:
As above

other outputs:
project study

9. Others information:

Stamp of the AGH UST Faculty

Project Supervisor
(signature)
prof. dr hab. inż. Zbigniew Kąkol

Dean of the Faculty
(signature and stamp)
AKADEMIA GÓRNICZO-HUTNICZA
im. Stanisława Staszica
30-059 Kraków, al. A. Mickiewicza 30
tel./fax (012) 633-26-49
tel. (012) 617-20-06, 617-39-00

prof. dr hab. inż. Zbigniew Kąkol, v-ce Rector for Education AGH UST

Place and date: Krakow, February 28, 2012