QUESTIONNAIRE

Please, fill in the Questionnaire and return it to contact person in Moldova:

depintrel@asm.md. Phone: 272254

(*) – mandatory fields

	Details about organisation
* **Organisation name**	Institute of Electronic Engineering and Industrial Technologies ASM
Organisation acronym	IEEIT ASM
* **Organisation Activity** Type (**RES** - Research, **HE** - University, **SME** - Small and Medium Enterprise, **IND** - Industry, **OTH** - Other)	RES
* **Keywords of main research areas**	Electronics, Superconductivity, Nanotechnology
* **Head of organisation (first name, family name)**	Dumitru Ghitu
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* **Description of organisation and its research achievements for the last five years (~ 5000 signs)**

	Contact Information
* **Contact person (first name, family name)**	Anatolie Sidorenko
* **Department / Laboratory**	Cryogenic Laboratory
* **Position**	Head of Laboratory
* **Qualification and research experience**	Prof.Dr.hab. phys.-math.scien. Superconductivity of layered and low dimensional structures
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International co-operation / Participation in EU RTD programmes or other bilateral / multilateral actions INTAS, TACIS, TEMPUS, COST, EUREKA, other RTD programmes (please specify programme/s, project title/s and year/s
- Volkswagen Bilateral Project Nr. I/72170 "Interface and Surface Superconductivity in Prox-imity-Effect Coupled Multilayers", with Universitat Karlsruhe, Duration: 01.01.1997- 30.04.2000. - INTAS Project Nr. 99-00585 "Microstructure and chemistry of buffer layers in multi-layered structure based on high temperature superconducting thin films for ULSI interconnections and passive microwave devices" Duration: 01.05.2000- 30.04.2003. - BMBF Bilateral Project Nr. MD02/002, "Spin-polarized electron transport in S/F microelements", with Institut fur Physik Universitat Augsburg. Duration: 01.07.2003- 31.12.2005. - RFBR-Moldova Bilateral project Nr.R18 “Nanostructures superconductor/ferromagnet for superconducting spintronics”, with Moscow State University, Duration: 01.01.2006- 31.12.2007 - BMBF Bilateral Project Nr. MD01/007, " Superconducting Magnesium Diboride Films for Technical Applications", with Institut of Nanotechnology, FZK, Duration: 01.03.2007- 31.03.2008. - RFBR-Moldova Bilateral project “Investigation of pinning force and the possibility of critical

temperature and critical current enhancement for MgB_2", with ISSP RAS, Moscow-Chernogolovka, Duration: 01.07.2008- 31.12.2009.

	* Please, use "X" to indicate the scientific area/s of your potential project
CHEMISTRY	
SOCIAL AND HUMAN SCIENCES	
ECONOMIC SCIENCES	
ENGINEERING SCIENCE	
ENVIRONMENT	
AGRICULTURE AND FOOD	
HEALTH	
MATHEMATICS	
INFORMATION SCIENCE	
PHYSICS	X
NANOTECHNOLOGIES	X
ENERGY	
TRANSPORT	
SPACE	

*** Summary of potential research project envisaged hosting of European researcher for the period of between 1 and 2 years**

1) **Superconductor/Feromagnet hybrid structures**.

The so-called Fulde-Ferrell-Larkin-Ovchinnikov (FFLO) state can be realized in artificially layered superconductor-ferromagnet (S/F) nanostructures, i.e. in S/F layers with film thickness in the nanometer range. The most spectacular effect predicted by the theory for quite some time, the re-entrance of the superconducting state, could be detected convincingly only very recently. The main goals of the proposed project are: (1) study of T_c oscillations in S/F bilayers utilizing different ferromagnetic alloys to achieve different limits of the ratio of exchange energy to thermal energy to maximize the oscillation amplitude and the temperature range in which superconductivity vanishes for samples with re-entrant behavior; (2) study the influence of an external magnetic field on the T_c oscillations and the re-entrance phenomenon; (3) elaborate the theoretical description for the experimental results; (4) apply knowledge, collected from bilayers, to T_c oscillations in F/S/F trilayers to built a superconducting spin-valve for spintronics.

2) **Superconducting Magnesium Diboride Films with artificial pinning centres for Technical Applications**.

In course of the possible project, it is planned to develop a novel technological usable method for pinning enhancement of thin MgB_2 (magnesium diboride) films. This is one necessary step to overcome the Thermally Activated Flux-Flow driven dramatic dropdown of the critical current for MgB_2 in strong external magnetic field. If this problem could be solved, MgB_2 would be the cheapest and suitable material for technical applications for cables, wires or coils fabrication. The original process, which was accepted for patent procedure at 15.02.2008, means to cover the surface of MgB_2 with artificial pinning centres. To reach the main goals of the project it is also important to investigate the pinning-depinning process in MgB_2, both for fundamental research to clarify the intrinsic properties of the novel superconducting material, and for practical reason taking into account the possibility of the preparation of MgB_2 layers and wires with high critical current to be used in technical applications.

	Please, confirm your agreement on data publication and dissemination
I agree with the publication of the data on the web-site **http://www.inco-eeca.net**, and **dissemination** among Mobility National Contact Points of the EU MS and AC **(YES /)**	YES.
Date 12.06.2008	