



Application Form for MICROKELVIN Transnational Access Project

1. General Information

Project number:		
Project Title:	<u>Novel type of heat exchangers for nuclear cooling refrigerators</u>	
Lead scientist: ¹	Title:	<u>RNDr., PhD.</u>
	First name:	<u>Slavomír</u>
	Last name:	<u>Gabáni</u>
	Birth date:	<u>18th April 1974</u>
	Passport number:	<u>4912551</u>
	Research status/Position:	<u>Physicist/senior research fellow</u>
	New User: ²	<u>Yes</u>
	Scientific Field:	
	Home institution:	<u>Institute of Experimental Physics, SAS</u>
	Is your home institution MICROKELVIN partner?	<u>Yes</u>
	Business address:	
	Street:	<u>Watsonova 47</u>
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	Zip/Postal Code:	<u>04001</u>
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	E-mail:	<u>gabani@saske.sk</u>
	Curriculum vitae (18 lines max): date and place of birth: <i>April 18, 1974 Košice, Slovakia</i> marital status: <i>married</i> wife: <i>Mária Gabániová, RNDr., PhD.</i> children: <i>Mária, Magdaléna</i> home address: <i>Bratislavská 54, 040 11 Košice, Slovak Republic, Europe</i> - 1992/1997 Faculty of Science, P. J. Šafárik University, Košice – course of study: condensed matter physics 1997/2000 Postgraduate study at Faculty of Science, P. J. Šafárik University main course of study: <i>solid state physics and acoustic</i> specialization: <i>low temperature physics and technique</i> 2000/2010 research fellow at Centre of low temperature physics of IEP SAS - Postdoctoral stays: TU WIEN, 01/10/2001-31/10/2001, ³ He cryostat laboratory TU WIEN, 01/04/2002-30/09/2002, High pressure laboratory HMI BERLIN, 26/05-13/06/2003, 31/05-18/06/2004, 15/05-03/06/2006, 04-21/06/2007, V10 – 1D neutron diffractometer Kobe University, 01/09-18/12/2005, NMR laboratory of Dept. of Physics CEA Grenoble, 18/02-17/05/2008, INAC/SPSMS/IMAPEC laboratory	
	Five most recent publications:	
	1- Sluchanko N.E., Bogach A.V., Glushkov V.V., Demishev S.V., Gavrilkin S.Yu., Shitsevalova N.Yu., Filipov V.B., Gabáni S. , Flachbart K., Journal of Experimental and Theoretical Physics Letters 91 (2010) 81-84	
	2- Bogach A.V., Demishev S.V., Flachbart K., Gabáni S. , Glushkov V.V., Levchenko A.V., Shitsevalova N. Yu., Sluchanko D.N., Sluchanko N.E., Magnetism and Magnetic Materials 152-153 (2009) 45-48	

¹ The lead scientist indicated here is expected to participate in the campaign as a user of the infrastructure.

² Indicate 'Yes' only if the user has never visited the infrastructure before this specific project, otherwise write 'No'.

	3- Flachbart K., Bartkowiak M., Demishev S., Gabáni S. , Glushkov V., Herrmannsdorfer T., Moshchalkov V., Shitsevalova N., Sluchanko N., Physica B 404 (2009) 2985-2987		
	4- Derr J., Knebel G., Braithwaite D., Salce B., Flouquet J., Flachbart K., Gabáni S. , Shitsevalova N., Physical Review B 77 (2008) 193107		
	5- Siemensmeyer K., Wulf E., Mikeska H.-J., Flachbart K., Gabáni S. , Maťaš S., Priputen P., Efdokimova A., Shitsevalova N., Physical Review Letters 101 (2008) 177201		
<u>Other participating scientists:</u> ³	Name:	Position:	New User: ²
	1 Emil Gažo,	Leading engineer	<u>Yes</u>
	2-		
	3-		

³ Please list all participating user group members. Expand the table, if necessary.

2. Project Information

<u>Name of host infrastructure:</u>	Ultra low temperature laboratory, University of Lancaster, Lancaster, United Kingdom		
<u>Access provider / Infrastructure Director:</u>	Name: George Pickett/Shawn Fisher	g.pickett@lancaster.ac.uk s.fisher@lancaster.ac.uk	
<u>Planned project dates:</u>	Start date:	10/05/2010	Completion date: 28/05/2010
<u>Project description (12 lines max):</u> The Ultra low temperature (ULT) laboratory at Lancaster University has world leading low temperature facilities, built in-house, with record-high performance dilution refrigerators and nuclear demagnetisation stages capable of cooling samples and devices to micro-Kelvin temperatures. The ULT group at Kosice also uses a custom made nuclear demagnetisation refrigerator and a diffusion welded Cu stage capable of cooling samples down to 150 micro-Kelvin. However, the dilution refrigerator for the Kosice machine does not perform very well due to poor heat exchangers, and subsequently the pre-cooling time required prior to demagnetisations is excessively long, and the cold-time after demagnetisation is relatively short. To solve this, we need to build new heat exchangers for the refrigerator. This project will allow us to use the facilities and skills of the Lancaster group to develop our own skills and to commence building a new set of state-of-the-art heat exchangers. We will also develop our skills and techniques in running high performance refrigerators to maximise the benefit of the new heat-exchangers.			
<u>Scientific objectives of the project (12 lines max):</u> The primary scientific and technological objectives of the proposed project are to use the facilities and skills base at Lancaster to further develop our own skills and specialist techniques to design and manufacture high performance heat exchangers. We will use these skills, and the specialist facilities at Lancaster, to commence building a new set of high performance heat exchangers for our own dilution refrigerator at Kosice which will vastly improve our low temperature capabilities. We will also use the Lancaster facilities to develop our techniques for maximising the efficiency and performance of dilution refrigerators, for measuring and monitoring the temperature of the refrigerator, and for running demagnetisation experiments to cool samples to micro-Kelvin temperatures.			
<u>Technical description of work to be performed (20 lines max):</u> We will work with the Lancaster group to design and manufacture high performance heat exchangers. The timing of the project is ideal, since the Lancaster group will then be commencing their manufacture of the heat exchangers for their new advanced nuclear cooling refrigerator. We will use the Lancaster facilities and apply the vital skills and techniques which we have developed to commence building our own badly-needed new heat exchangers for our machine at Kosice. We will also take part in the running of the high performance dilution refrigerators and nuclear demagnetisation stages at Lancaster to develop our skills at maximising the efficiency of the dilution refrigerator, to learn new skills in measurement techniques and to further develop demagnetisation techniques to perform ultralow temperature experiments. These are vital skills and techniques which we can then use in Kosice to further our low temperature and experimental capabilities.			

3. Joint Proposals / Funding

Is this project in collaboration with other (concurrent) projects at the infrastructure?	No
If yes, please specify:	
Is this proposal submitted to any funding programmes?	No
If yes, please specify:	

The completed Application Form should be submitted to MICROKELVIN Management Office
(Katariina.Toivonen@neuro.hut.fi, fax +358-9-47022969)