

Report on the Transnational Access Activity carried out within MICROKELVIN

The eligibility of transnational access to a MICROKELVIN TA site implies the submission of the following:

1) The Certification of visit

The form "Certification of visit" must be completed and signed by the access provider in charge of the infrastructure and the leader of the project.

2) A TA project report

The form for the TA project report is contained within this document. It should be completed after project end by the group leader of the project. You must respect the limited number of words specified, longer descriptions will be rejected. Figures/tables may be attached at the end of the document. The document must be submitted in an editable format (doc, rtf).

3) A User group questionnaire

To enable the Commission to evaluate the Research Infrastructures Action, to monitor the individual contracts, and to improve the services provided to the scientific community, each project leader of a user-project supported under an EC Research Infrastructure contract is requested to complete a "user group questionnaire". The questionnaire must be submitted once by each user group to the Commission as soon as the experiments on the infrastructure come to end.

The user group questionnaire is not part of this document and must be completed on-line. It is accessible at:

http://cordis.europa.eu/fp7/capacities/questionnaire_en.html.

► **Please note that any publications resulting from work carried out under the MICROKELVIN TA activity must acknowledge the support of the European Community:**

“The research leading to these results has received funding from the European Community’s Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 228464 (MICROKELVIN).”

MICROKELVIN Transnational Access Project Report

1. General information

Project number:	LANC08	
Project Title:	Development of Cable and Filter Protocols for Nano-electronic Device Measurements at Microkelvin Temperatures	
Lead scientist: ¹	Title:	Prof. Dr.
	First name:	Stefan
	Last name:	Ludwig
	Home institution:	LMU-Munich
Host scientist: ²	Title:	Prof
	First name:	George
	Last name:	Pickett
	Home institution:	Lancaster University
Project scientist: ³	Title:	Dipl. Phys.
	First name:	Daniel
	Last name:	Harbusch
	Birth date:	30.03.1981
	Passport number:	802441828
	Research status/Position:	PhD-Student
	New User: ⁴	Yes
	Scientific Field:	Quantum Transport
	Home institution:	LMU-Munich
	Is your home institution MICROKELVIN partner?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Business address:	Fakultät für Physik, LS Kotthaus, Ludwig-Maximilians-Universität	
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¹ The lead scientist indicated here is expected to participate in the campaign as a user of the infrastructure.

² The host scientist is supervising the work of the visiting project scientist at the infrastructure.

³ The project scientist is the person who will be visiting the infrastructure.

⁴ Indicate 'Yes' only if the user has never visited the infrastructure before this specific project, otherwise write 'No'.

2. Project information

<p><u>Please, give a brief description of project objectives:</u> (250 words max)</p>	<p>The primary scientific and technologic objective of this access collaboration is to investigate nano-electronic circuits in a hitherto unrivalled range of ultralow temperatures. This will allow the Ludwig group (LMU Munich) to reach lower energy scales and investigate collective phenomena such as the Kondo effect in coupled quantum dots, the 0.7 anomaly in quantum point contacts or the hyperfine interaction between confined electrons and many nuclear spins in much greater detail compared to the current state-of-the-art. Future possibilities include the study of coherent dynamics in semiconductor-based qubits at ultralow temperatures. The combination of the expertise in ultralow temperature physics in Lancaster and in our low temperature nano-electronic measurements in Munich provides the framework for a successful collaboration. Nanostructures will be produced and initially characterized in Munich while the final ultralow temperature measurements will then be performed in Lancaster. The short term objective of this initial visit was to ensure that the Lancaster facility has the necessary equipment, cables and noise-filtering systems in place to facilitate the planned future experiments.</p>
<p><u>Technical description of work performed:</u> (250 words max)</p>	<p>This visit was intended to lay the groundwork in Lancaster for designing and installing customized filters and cabling for our new measurements on the new Lancaster MICROKELVIN machine. Furthermore, it was also used to verify that nanodevices fabricated and tested in Munich can be easily transported to and installed on the Lancaster apparatus.</p>
<p><u>Project achievements (and difficulties encountered):</u>⁵ (250 words max)</p>	<p>We discussed cable and filter options at great length, and worked on new designs with the Lancaster group. The design discussions were very useful and also made us aware of other issues that would be involved in mounting new experiments on an access facility, for example the ancillary room-temperature electronics that will be required, how they will be provided, and how to achieve an extreme low-noise environment with shielding protocols that we have developed in Munich. The exchange of knowledge and expertise was very fruitful. Further achievements included agreement on exactly what specific cable and connectors would be purchased and used, and on the custom passive devices to be built by each party of the collaboration.</p>
<p><u>Expected publications and dates:</u></p>	<p>Publication is expected after the first access experiments have taken place.</p>
<p><u>Submission date of user group questionnaire:</u></p>	<p>13 Feb, 2012</p>

Completed Project Reports should be returned to MICROKELVIN Management Office
(Sari.Laitila@aalto.fi, Fax: +358 9 47022969).