welcome to the
European Microkelvin Collaboration

CAPACITIES

MICROKELVIN Transnational Access Project Report

1. General information

Project number:	**TKK 02**	
Project Title:	Design of mechanical cantilevers for a sub-mK experiment	
Lead scientist:[1]	**Title:**	Dr.
	First name:	Tjerk
	Last name:	Oosterkamp
	Birth date:	9 October 1972
	Research status/Position:	Associate professor
	New User:[2]	Yes, I have seen the facility, but never used it.
	Scientific Field:	Physics – microcantilevers
	Home institution:	Leiden University
	Home institution is MICROKELVIN partner:	Yes ☒ No ☐
	Business address:	
	Street:	Niels Bohrweg 2
	Street No.:	2
	PO Box:	
	City:	Leiden
	Zip/Postal Code:	2333 CA
	Country:	The Netherlands
	Telephone:	+31-71-5275424
	Fax:	+31-71-5275404
	E-mail:	oosterkamp@physics.leidenuniv.nl

[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'.

2. Project information

Please, give a brief description of project objectives: (250 words max)	**In Leiden we have developed a system by which to detect a cantilever with very good force sensitivity and position sensitivity that does not require optical detection. Instead it uses a SQUID to read out the change in flux in a nearby coil due to a magnetic particle that is attached to the cantilever. This cantilever may be applied in a range of situations, e.g. as a force sensor for Magnetic Resonance Force Microscopy, as a viscosity measuring device in mixtures of He3 and He4, or possibly as a low temperature thermometer.** **Learned about experimental details and design a sub-mK experiment for the cantilevers employing a copper nuclear demagnetization stage. For this it was important that there were one or two discussion partners with the necessary expertise that were willing to help me out.**
Technical description of work performed: (250 words max)	**In preparation of the experimental part of my visit I think we should go over the technical requirements in detail together.** - Learned about nuclear demagnetization experiments. **Discussed vibrations and interference in pulse tube refrigerators.** **Discussed SNS cryo coolers.** **Discussed low temperature resonators.**
Project achievements (and difficulties encountered):[5] (250 words max)	**Reality check when it comes to ultralow temperature experiments.**
Expected publications and dates:	▪ ▪ ▪
Submission date of user group questionnaire:	24.11.2009