

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:	CNRS17	
Project Title:	Late-time dynamics of quantized vortices generated after absorption of a neutron in superfluid 3He-B	
Lead scientist: ¹	Title:	Dr.
	First name:	Anna
	Last name:	Pomyalov
	Home institution:	The Weizmann Institute of Science
Host scientist: ²	Title:	Directeur des recherches
	First name:	Yury
	Last name:	Bunkov
	Home institution:	Institut Néel, CNRS - Grenoble
Project scientist: ³	Title:	Dr.
	First name:	Anna
	Last name:	Pomyalov
	Birth date:	18/12/1964
	Passport number:	10187585
	Research status/Position:	Staff Scientist
	New User: ⁴	Yes
	Scientific Field:	Turbulence in helium superfluids
	Home institution:	Weizmann Institute of Science, Rehovot, Israel
	Is your home institution MICROKELVIN partner?	No
	Business address:	The Weizmann Institute of Science
	Street:	Hertzl str, 234
	PO Box:	
	City:	Rehovot
	Zip/Postal Code:	76100
Country:	Israel	
Telephone:	+972-934-2308	
Fax:	+972-934-4123	
E-mail:	Anna.pomyalov@weizmann.ac.il	

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

<u>Please, give a brief description of project objectives:</u> (250 words max)	The main objective of the project was to clarify the uncertainty in the interpretation of different dynamic measurements at the lowest temperatures, in particular, to perform a careful analysis of the relative importance of different physical mechanisms underlying the experimental observations. This is a necessary step before any further use of the helium superfluids as laboratory model systems of coherent quantum matter in the vacuum $T \rightarrow 0$ limit can be made.
<u>Technical description of work performed:</u> (250 words max)	A detailed analysis of the experimental data from the DN1 cryostat of the Microkelvin facility in Grenoble was performed. The applicability of the "standard" Kibble-Zurek model of the nucleation of topological defects in homogeneous conditions was confirmed: the energy stored in the tangle of quantized vortex lines agrees well with the experimentally observed energy deficit. To rationalize the long life time of the energy deficit we reconsidered several new mechanisms in the tangle evolution and showed, for example, that vortex production by counterflow should be disregarded, while the emission of small vortex loops was found to be very important.
<u>Project achievements (and difficulties encountered):</u> ⁵ (250 words max)	Based on the new understanding achieved during this visit and the results obtained during previous visits of profs. V. L'vov and A. Golov , a manuscript with the title "Evolution of Neutron-Initiated Micro-Big-Bang in superfluid He-3B" by Y. Bunkov, A. Golov, V. Lvov, A. Pomyalov, and I. Procaccia was written and uploaded to the Los Alamos electronic archive: arXiv:1309.1005. This manuscript will be submitted to Phys. Rev. B shortly. The results provide a basis for further studies, in particular for analytical and numerical modeling.
<u>Expected publications and dates:</u>	The manuscript "Evolution of Neutron-Initiated Micro-Big-Bang in superfluid He 3B" by Y. Bunkov, A. Golov, V. Lvov , A. Pomyalov, and I. Procaccia will be submitted to Phys. Rev. B in 2013.
<u>Submission date of user group questionnaire:</u>	6/09/2013

Completed Project Reports should be returned to MICROKELVIN Management Office

(Sari.Laitila@aalto.fi, Fax: +358 9 47022969).

CERTIFICATION OF VISIT at MICROKELVIN Transnational Access Site

I herewith confirm that the following project was carried out at our Transnational Access Site
TA2 CNRS Grenoble

in the context of MICROKELVIN Transnational Access:

**Late-time dynamics of quantized vortices generated after absorption of a neutron
in superfluid $^3\text{He-B}$**

The amount of access¹ delivered to the project group (project users) is as follows:

	Participant name	Duration of stay (start – end date)	Amount of access ²
Project leader:	Dr. Anna Pomyalov	5/8 -20/8/2013	16 days
Project user 1:	<i>— // —</i>	<i>— // —</i>	<i>— // —</i>
Project user 2:			
Project user ... ³			
Total amount of access delivered to project group:			<i>16 days</i>

Aalto Univ. Helsinki 5.09.2013
Location and date

[Signature]
Signature of access provider
Yu. Bunkov

Rehovot, Israel 5/09/2013
Location and date

[Signature]
Signature of project leader
Anna Pomyalov

Completed Certification of Visit should be returned to MICROKELVIN Management Office
(sari.laitila@aalto.fi, fax: +358 9 47022969)

¹ TKK Helsinki, CNRS Grenoble, or Lancaster University

² The amount of access is defined as the time, in days, spent by the user at the infrastructure for this project, including weekends and public holidays (e.g., a scientist who spent 5 days at the infrastructure must indicate '5'). The total amount of access of the project group is the sum of access days of each project user.

³ Please, expand if necessary