



# Evaluation Report for the Global COE,

The Next Generation of Physics, Spun from Universality and Emergence,  
Department of Physics, Kyoto University  
<http://www.scphys.kyoto-u.ac.jp/gcoe/>



This is a Format Sheet for evaluation.

**To: Hikaru Kawai / The Global COE Leader of**  
The Next Generation of Physics,  
Spun from Universality and Emergence,

(Evaluated by)

Name	BERTHIER Claude	Title	Emeritus Director of Research
Affiliation	LNCMI, CNRS, UPR3228, UJF, UPS, INSA, Grenoble France	Date	6 <sup>th</sup> December 2012

## 1. Comments / Suggestions / Evaluations of our GCOE program

\*Please find the attached descriptions about this report and the GCOE project.

### 1.1 Research

My stay in the group of Professor Ishida was in the framework of the "The physics of new quantum condensate phases".

. On the experimental point of view, I introduced my experience and that of my NMR group at Grenoble of doing NMR on very small single crystals using micro coils adapted at the size of samples (typically  $1 \times 1 \times 0.2 \text{ mm}^3$ ).

We have also discussed about future collaboration for NMR experiments in the resistive Magnets of the High Magnetic Field Laboratory in Grenoble. Two topics seem very attractive but require initial preparation by experiment in conventional superconducting magnet. The pnictide compound  $\text{LiFeAs}$  is expected to present anomalous behavior in high magnetic field related to a strong anisotropy. Another very interesting topic is  $\text{Li}_{0.9}\text{Mo}_6\text{O}_{17}$ , which presents some kind of reentrant superconductivity at high field. We shall continue to elaborate these projects during the forthcoming months.

### 1.2 Education

During the two months I spent here,

I gave two lectures on Quantum Spin Systems in High Magnetic Field, illustrated by High Field NMR experiments. I also gave a GCOE seminar on freshly discovered Field Induced Charge ordering in underdoped cuprates. During my stay, I also gave an invited talk at a workshop organized at the Yukawa Institute on quantum spin systems.

### 1.3 Collaboration in Different Fields

I have also discussed about future collaboration for NMR experiments in the resistive Magnets of the High Magnetic Field Laboratory in Grenoble with Prof. K. Ishida, Prof. Y. Matsuda, Prof. Y. Maeno, and other faculty staffs here.

I am also very happy to have been able to have many fruitful discussions with students, Prof. K. Yoshimura, Assistant-Professor S. Yonezawa and visitors (Prof. Y. Yanase).



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## 1.4 Outreach

This did not come up during my stay.

## 2. Suggestions for Improvements

I discussed various ideas with Profs, K. Ishida and Y. Maeno.

## 3. General Comments on our GCOE project

BIEP (Bilateral International Exchange program) is an excellent program encouraging PHD students to know oversea research institute and the culture and life there.

Mr. Tetsuya Iye visited our high-field institute in Grenoble for three months. This gives us a good opportunity to collaborate on NMR studies with Prof. K. Ishida' group again.

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