



agence d'évaluation de la recherche
et de l'enseignement supérieur

Section des Unités de recherche

Report from the visiting committee

Research unit :

Physique des Liquides Milieux Complexes – EA 3954

University Paris 12



February 2008



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Section des unités
de recherche

Le Directeur

Jean-Jacques Aubert

February 2008



Report from the visiting committee



The research unit :

Name of the research unit : Physique des Liquides Milieux Complexes

Requested label : EA

N° in case of renewal : 3954

Head of the research unit : M. Said AMOKRANE

University or school :

University Paris 12

Other institutions and research organization:

Date(s) of the visit :

February, 19th of 2008



Members of the visiting committee

Chairman of the committee :

Mr David DEAN, IRSAMC, Toulouse

Other committee members :

Mr Jean-Pierre HANSEN, Cambridge University

Mr Marek KUS, Polish Academy of Sciences, Warszawa

Mr Alain BARRAT, LPT, Orsay

CNU, CoCNRS, CSS INSERM, représentant INRA, INRIA, IRD.....) representatives :

Mr Pierre PUJOL, Irsamc, Toulouse, CNU section 29

Observers

AERES scientific representative:

Mr André NEVEU

University or school representative:

Mr Frank PACARD



Report from the visiting committee

1 • Short presentation of the research unit

- Effectif : enseignants chercheurs : 6, doctorants : 2, administratifs : 0.25
- Nombre de HDR : 2
- Nombre de HDR encadrant des thèses : 2
- Nombre de theses : 1
- Nombre de theses en cours : 2
- Nombre thesards finances : 2
- Nombre de membres bénéficiant d'une PEDR : 1
- Nombre de publiants : 6

2 • Preparation and execution of the visit

The committee was satisfied with the presentations made during the evaluation.

The opportunity was given to talk to all academic members of the laboratory.

The presentations were clear and concise and the representative of Paris 12 was able to answer our questions about how the laboratory is situated in Paris 12 and its perspective for future development. It would have been useful to have had the full version of the laboratories activity report before the evaluations rather than the less detailed version that was sent to the committee before.

3 • Overall appreciation of the activity of the research unit, of its links with local, national and international partners

The laboratory consists of one research group working on integral equation approaches to complex fluids and the evaluation of their accuracy via numerical simulations. All researchers are enseignant chercheurs. They all publish and the overall scientific output is quite good given the heavy charges of teaching and administration undertaken by its members. The level of production is somewhat lower than that of university staff of the leading scientific nations. This observation should be tempered by the fact that the teaching and administrative load is higher than that in leading scientific nations while at the same time the level of financial, administrative and technical support is considerably lower.

The main topic of research, integral equation approaches such as HNC and mode-coupling theory tested against numerical simulations, exhibits a high degree of technical competence, however this line of research is not mainstream and risks to be seen as somewhat secondary to the main preoccupations and new subjects being developed in the wider community. However the fact that the laboratory has been solicited to write articles by certain journals indicates an interest in their work and the fact that in what they do they are recognised as being near the forefront.



The evolution of the laboratory has been positive with a number of recruitments of MCFs of good quality. This is a very satisfactory performance given the difficulty that the physics department in Paris 12 has - few students wishing to study physics and the fact that physics does not appear to be a scientific priority for Paris 12 which places emphasis on more applied science (medicine and environmental sciences for example). The laboratory appears to function well on the level of internal collaborations but certainly lacks collaborations on a national, European and wider international level. What is surprising is the low degree of collaborations with other institutions in the Paris area, as there are many studying the same and related areas of physics.

4 • Specific appreciation team by team and/or project by project

See above as there is basically one project (with subprojects within it).

5 • Appreciation of resources and of the life of the research unit

Given the size of the laboratory there are not many management issues, the younger members of the laboratory should be encouraged to be more independent.

The laboratory clearly suffers from a lack of administrative and technical support. The recent recruitments are of quality.

Communication within the laboratory is presumably good given the size of the laboratory. There does not appear to be any regular seminar activity and there is a lack of visitors, these points are clearly a consequence of the small size of the laboratory. There were no invitations to international conferences.

6 • Recommendations and advice

– Strong points :

The laboratory has a strong expertise in integral equation and other closure scheme approaches that it has been applying and extending to more complex liquids and in particular cases of high polydispersivity. They have been able to recruit young enseignant chercheurs of a good scientific level. Despite their size and the absence of any full time researchers they have a respectable level of scientific production.

– What needs to be improved :

The expertise used should be applied to more mainstream and newly developed areas in complex fluids and soft condensed matter. The level of collaboration with other laboratories, especially in the Paris area, should be increased and the research activity somewhat diversified.

The laboratory should develop collaborations that will help it acquire more research funding, for example from the ANR and possibly industrial sources.



– Recommendations :

At the moment despite its small size, lack of funding and relative isolation the laboratory has a good scientific activity. The situation is however very difficult and one could say that the laboratory is surviving rather than flourishing. If the laboratory wants its working conditions to improve, the only long-term option is to become a component of a larger laboratory.

Plans in this direction were presented to the committee but they were very preliminary. Given that there are a significant number of researchers at the beginning of their careers in this laboratory, it is important to pay close attention to the laboratories development to ensure that their research potential is realised. We recommend that the laboratory be evaluated in 2 years time and that at that moment they should be able to present concrete plans for their integration into a structure that will enable its members to fully realise their potential in good working conditions.



**Réponse de la Présidence de l'université Paris 12 - Val de Marne
au rapport d'évaluation des experts de l'AERES
pour le laboratoire « Physique des Liquides, Milieux Complexes »
(EA 3954)**

To the director of the unit section.

We carefully read the report from the expert committee of the research unit Physique des Liquides Milieux complexes EA 3954 and agree with their conclusions.

Specific comments are answered by the director of the unit. The direction of the university agrees that the main point for this unit is to develop new fields and find new collaborations. It must be mentioned that during the last two years the head of research of the university has tried to find a place within the components of Paris 12 including an association of this team with the large department of chemistry (ICMPE) in Thiais. Clearly, this option has been denied by the director of the unit. We are now trying to facilitate collaborations between this unit and a larger group of Physic in Marne la Vallée. The discussion just began but no clear statement has been made so far. The head of the department of research of the university will try to find a solution where the team would be able to develop within the next two years and help the team to get more research funding.

Simone Bonnafous
Présidente de l'université



**Réponse du directeur du laboratoire « Physique des Liquides, Milieux Complexes »
(EA 3954) au rapport d'évaluation de l'AERES, volet particulier**

Overall appreciation of the activity.

- Level of production

A quantitative comparison should also take into account the fact that our production results almost exclusively from the work of the members of the group ¹ – whereas university staff in large scientific departments usually benefit from collaborations with post-docs, visiting scientists, colleagues from other institutions etc..

1. Until 2007 the group had only four permanent members.

- Main topic of research

The committee has underlined a technical expertise in integral equations approaches: we stress here that this is developed in the domain of complex fluids, which is all but a fully explored one (minor details: we precisely work on methods well beyond the HNC approximation, in the regime of high size asymmetry – not “polydispersivity”). However, our activity involves also a significant part of modelling – see for example our recent invited paper on strongly confined colloids (noticed in the report).

The comment on the main topic of research suggests that a risk exists that it might be considered as “marginal” with respect to what is done elsewhere. We stress the following arguments against this view:

- (1) what has just been said on the work on confined colloids – a still developing field;
- (2) the development of experimental methods capable of probing and manipulating complex fluids at the level of particles. As emphasized during the oral presentation this is precisely the level of description used in the group;
- (3) the number of groups throughout Europe, especially in the UK, Germany, the Netherlands, Spain, Italy (also in France, albeit to a lesser extent) and the rest of the world (in particular in the USA, Japan and more recently China) working on similar subjects with the same methods;
- (4) finally, it is also our choice to not always follow the “trendy” subjects but rather use rigorous quantitative methods even if they are confronted - in the first stage - to more conventional subjects.

Our group is thus not away of the mainstream research in the field of soft condensed matter but it works in one of its branches (that of microscopic approaches) that is potentially rich of applications. Our group is actually often solicited for reviewing papers in the same field by top-level journals such as Physical Review E and Journal of Chemical Physics (about ten times last year).

As announced in the scientific project, an effort will nevertheless be made towards mesoscale approaches and the emphasis put on dynamical properties. This should diversify

our research activity and facilitate future collaborations.

Recommendations, advice.

- Collaborations

New collaborations should take place in the framework of the new projects cited above (see also *recommendations* below).

- Funding

An effort will also be made to search additional funding, through the ANR in particular, especially for financing PhD theses and post-docs.

- Recommendations.

It is stated in the report that “ ... at the moment... the laboratory has a good scientific activity. The situation is however very difficult and one could say that the laboratory is surviving rather than flourishing”. We recall what was said about this in the main document (§ II.3.2) that has been transmitted to the ministry of education :

“ Rappelons d’abord comment se pose cette question de l’évolution de l’équipe :

D’un côté, l’autonomie au plan scientifique, une recherche peu coûteuse, une production qualifiée (3) de « bonne » et un effectif réduit, certes, mais non insignifiant (six permanents, un ATER et quelques doctorants), militeraient en faveur du maintien de l’équipe dans l’état.

Par ailleurs, nous sommes conscients des difficultés qu’occasionne à l’équipe le fait d’être à l’écart des axes que l’université souhaite développer (chimie et matériaux d’un côté et « environnement » de l’autre) et de la politique de regroupement prônée par la tutelle. ”

We are fully aware of the advantages of a possible association with a larger Laboratory, provided that it is scientifically sound and does not result in a physical or scientific dispersion of the group. This is however a real issue and the present lack of such an association is not a matter of “mauvaise volonté” from our side. This is testified by several contacts we have initiated with colleagues from different laboratories, locally and in the Paris area. They emphasized the fact that strongly structured laboratories are often reluctant to welcome additional research teams. These efforts will however be pursued even more intensively in the coming months and hopefully, a satisfactory solution will be found soon.

Créteil, le 18 mars 2008



Saïd Amokrane
Responsable du Laboratoire



Simone Bonnafous
Présidente de l’université