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CELIA - Centre lasers intenses et applications

Rapport Hcéres

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HCERES

High Council for the Evaluation of Research
and Higher Education

Research units

HCERES report on research unit:

Centre Lasers Intenses et Applications

CELIA

Under the supervision of
the following institutions
and research bodies:

Université de Bordeaux

Commissariat à l'Énergie Atomique et aux Énergies
Alternatives – CEA

Centre National de la Recherche Scientifique – CNRS

HCERES

High Council for the Evaluation of Research
and Higher Education

Research units

In the name of HCERES,¹

Didier HOUSSIN, president

In the name of the experts committee,²

Alain DUBOIS, chairman of the committee

Under the decree No.2014-1365 dated 14 november 2014,

¹ The president of HCERES "countersigns the evaluation reports set up by the experts committees and signed by their chairman." (Article 8, paragraph 5)

² The evaluation reports "are signed by the chairman of the expert committee". (Article 11, paragraph 2)

Evaluation report

This report is the result of the evaluation by the experts committee, the composition of which is specified below.

The assessments contained herein are the expression of an independent and collegial deliberation of the committee.

Unit name:	Centre Lasers Intenses et Applications
Unit acronym:	CELIA
Label requested:	UMR
Present no.:	5107
Name of Director (2014-2015):	Mr Philippe BALCOU
Name of Project Leader (2016-2020):	Mr Philippe BALCOU

Expert committee members

Chair:	Mr Alain DUBOIS, Université Pierre et Marie Curie
Experts:	Mr Alberto BRAMATI, Université Pierre et Marie Curie
	Ms Pascale HENNEQUIN, École Polytechnique (représentant du CoNRS)
	Mr Paul-Antoine HERVIEUX, Université de Strasbourg (représentant du CNU)
	Mr Reinhard KIENBERGER, Université Technique de Munich, Allemagne
	Mr Gilles MAYNARD, Université Paris-Sud
	Mr Fabien QUERE, IRAMIS CEA
	Mr Roland SMITH, Imperial College London, Royaume Uni

Scientific delegate representing the HCERES:

Ms Sylvie MAGNIER

Representatives of the unit's supervising institutions and bodies:

Mr Bertrand AUDOIN (représentant de l'École Doctorale n°209 - SPI)

Mr Noël DIMARCO, CNRS-INP

Mr Éric FREYSZ, Département Sciences et Technologies

Ms Susana GOTA-GOLDMANN, CEA/DSPG

Mr Francis HARDOUIN, CEA/DAM

Mr Yannick LUNG, Université de Bordeaux

Mr Thierry MASSARD, CEA/DAM

Mr Jean-Luc Pozzo, Département Sciences et Technologies

Ms Pascale ROUBIN, CNRS-INP

1 • Introduction

History and geographical location of the unit

Centre Lasers Intenses et Applications (CELIA) was officially created in 1999 in the context of the launch of the Laser MegaJoule (LMJ) project. It is located in Talence, in a building (C6) owned by the Université of Bordeaux and has partial responsibility for another building at Le Barp, which hosts Institut Lasers Plasmas in the neighbourhood of LMJ. CELIA is a joint research unit (UMR 5107) affiliated to the Université de Bordeaux (UB), to Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA), through Direction des Applications Militaires (DAM) and Direction des Sciences de la Matière (DSM), and to Institut de Physique (INP) and Institut des Sciences de l'Ingénieurs et des Systèmes (INSIS) of Centre National de la Recherche Scientifique (CNRS).

CELIA is composed of 50 permanent staff members, about 40% from CNRS and equally balanced between CEA and UB. CELIA has a rather low ratio of support staff with respect to its involvement in experimental and instrumental activities (13, including research engineers, mainly from CNRS). The support services correspond to administration, IT and technical service, including instrumentation and mechanical design office and workshop. At the beginning of the present contract the research activities at CELIA were organized around five teams, which were restructured into four in 2012:

- team 1: Optics and Femtosecond Lasers Group (GOLF);
- team 2: Harmonics in the XUV, ultra-short processes and applications (HXUV);
- team 3: Particles and Transport, ultra-short Radiation matter Under extreme conditions (PETRUX);
- team 4: Interaction, Inertial Controlled Fusion, and Astrophysics (IFCIA).

Management team

The management team is composed of a director, Mr Philippe BALCOU, one (two) deputy director(s), Mr Vladimir TIKHONCHUK (with, until December 2013, Ms Ghita GEOFFROY) and an administrator, Ms Sophie HEURTEBISE.

HCERES nomenclature

ST2 Physique (main) and ST5 Sciences pour l'Ingénieur (secondary).

Unit workforce

Unit workforce	Number as at 30/06/2014	Number as at 01/01/2016
N1: Permanent professors and similar positions	13	16
N2: Permanent researchers from Institutions and similar positions	24	22
N3: Other permanent staff (without research duties)	12	11
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers (Emeritus Research Director, Postdoctoral students, visitors, etc.)	9	
N6: Other contractual staff (without research duties)	3	1
TOTAL N1 to N6	61	50

Unit workforce	Number as at 30/06/2014	Number as at 01/01/2016
Doctoral students	27	
Theses defended	31	
Postdoctoral students having spent at least 12 months in the unit	18	
Number of Research Supervisor Qualifications (HDR) taken	6	
Qualified research supervisors (with an HDR) or similar positions	18	20

2 • Overall assessment of the unit

Global assessment of the unit

CELIA is a very dynamic research unit covering with coherence a wide domain of laser-matter interaction physics and technology. With an excellent scientific production and an active participation in the community of high-power, high-intensity, ultrafast laser sciences and dense and hot plasmas physics, CELIA holds indisputably a high national and international recognition. The originality of CELIA stems from the mixing of experimental and theoretical activities, with mutual synergy, and also from the good balance between high profile fundamental research and industry transfer activities. The latter have a real impact in the socio-economic environment in Aquitaine.

CELIA is an excellent research center that is immersed in a rich ecosystem and in an outstanding laser environment, in-house, in France (Le Barp and Saclay) and in Europe. This is a fertile ground that will strengthen the expertise and visibility of CELIA staff in the coming years.

Strengths and opportunities in relation to the context

- excellent teams covering a large spectrum of high energy density and ultrafast physics;
- synergy between theory/modeling and experimental activities;
- good expertise and visibility in a very competitive domain;
- proximity with LMJ/Petal facilities;
- strong activity in industry transfer and societal applications, with a very good recognition in the photonics and laser technology world in Aquitaine;
- integration of a new team covering laser-matter interaction thematic and which can open good synergies with CELIA team.

Weaknesses and threats related to the context

- necessity to continuously upgrade lasers chains and equipments in a context of decreasing ANR funding;
- funding of fundamental research projects in the new regional political priority moving towards societal issues;
- low ratio of technical support staff while CELIA is at the same time expanding scientifically;
- decreasing numbers of students in laser and fusion master.

Recommendations

- to upgrade CELIA laser facilities to stay international competitive and in synergy with team scientific strategy with projects set at the scale of CELIA capabilities in terms on human and financial resources;
- to prioritize recruitments to strengthen the technical services and laser engineering;

- to establish a coherent balance between applied and fundamental research for the benefits of all the CELIA teams;
- to fix the recurrent problem of limited office space, especially in the context of the integration of a new team.