

**Scientific and Economical Report of the PETAL Workshop / HiPER Meeting
Bordeaux, Hotel de la Region, 8 /9 December 2011-12-23**

Location: Palais de la Region, Bordeaux

Workshop Organiser: Dimitri Batani

The goal of the workshop was to address the "Physics with Petal", the new laser facility, which will be available to the scientific community for, experiments starting from 2014 (for what concerns the characterisation of the laser systems and diagnostics) and 2015 (for physics experiments).

PETAL / LMJ will be a unique facility where new domains of physics can be explored. These includes on one side studies of matter in extreme conditions and the so-called laboratory astrophysics experiments, and on the other side science related to Inertial Fusion for the future production of Energy (in particular study of advanced ignition schemes like fast ignition and shock ignition). This last topic is also strictly related to the European HiPER project, which is indeed closely related to the PETAL system as main French contribution to the project. For this reason, the present workshop was coupled to the annual meetings of the Working Packages 10 and 12 of the HiPER project.

The first day was devoted to the discussion of :

- i) the characteristics of the laser system
- ii) the work which is in progress for the development of the diagnostics
- iii) the physics topics which will be possible to study and first ideas of possible experiments
- iv) starting ceremony of the PETAL+ project (related to the construction of the diagnostics for PETAL)

Details of funding:

The Funding has been used as follows:

Association Lasers et Plasmas (France)	5000	(meals on December 8, Travels for French Participants needing support)
Region Aquitaine	2000	(for location of workshop)
University of Bordeaux	3000	(welcome party on Dec. 8 and travels of Members of PETAL Technical Advisory Committee)
European Science Foundation:	5000	of which:
		1300 for meals on December 8
		3700 for supporting travels, as follows:
		Leonida Gizzi, Pisa, Italy, 350 €
		Luca Labate, Pisa, Italy, 300 €
		Maria Richetta, Roma, Italy, 450 €
		Luca Antonelli, Roma, Italy, 450 €
		Petra Koester, Italy-Germany, 350 €
		Michaela Martinkova, Czech Republic, 350 €
		Milan Kalal, Czech Republic, 300 €
		Anatoly Faenov, Russia 550 €
		Biljana Gakovic, Serbia 600 €

No support has been directly given to French researchers using ESF funds since France does not support the SILMI programme.

About 90 researchers attended the workshop (the full list is available on <http://www.doodle.com/bud2upvfbw5gz8kq> and <http://www.doodle.com/qzpqz8akhd3ambd>). Only the supported speakers and participants have been listed I the ESF report.

The programme of the two days is also included in the report.



WORKSHOP : Physics with PETAL

8 -9 December 2011, Conseil Régional d'Aquitaine
14 Rue François de Sourdis, 33077 Bordeaux, France – Tel. +33 5 57 57 80 41

8th of December 2011

8h30–9h00 **Welcome**

9h00 -9h07 **MATHIEU HAZOUARD** • Regional council of Aquitaine

9h07-9h14 **PATRICK MORA** • ILP

9h14-9h20 **DIMITRI BATANI** • PETAL

9h20–13h00 **Workshop – PETAL-LMJ: overview of the facility, diagnostics & targets design**

Modérateur : Philippe Balcou - CELIA

9h20–9h35 **NATHALIE BLANCHOT** — CEA/DAM/CESTA
The PETAL laser system, concept and performances

9h35–9h50 **DIDIER RAFFESTIN** — CEA/DAM/CESTA
Diagnostics in a PW environment

9h50–10h05 **JULIEN GAZAVE** — CEA
EMP issues on Short Pulse Laser Facilities

10h05–10h20 **ANTOINE COMPANT LA FONTAINE** — CEA
Estimation of the sources terms on PETAL

10h20–10h30 **Coffee break**

Modérateur : Philippe Moretto - CENBG

10h30–10h45 **ALEXIS CASNER** • CEA/DAM/CESTA
Diagnostics on PETAL/LMJ, what is available, what are the possibilities?

10h45–11h00 **JEAN-ÉRIC DUCRET** • CELIA/Univ. Bordeaux
PETAL+, the proton spectrometer

11h00–11h15 **SÉBASTIEN HULIN** • CELIA/Univ. Bordeaux
PETAL+, the X-ray spectrometer

11h15–11h30 **SANDRINE DOBOSZ** • CEA Saclay
PETAL+, the electron spectrometer

11h30–11h45 **COLIN DANSON** • AWE, UK
Development and commissioning of ORION laser facility

11h45–12h00 **DIDIER MASON** • CEA Cadarache
Possible synergies between MCF and ICF: GEM detectors

12h00–12h15 **LEONIDA GIZZI** • INO, CNR, Pise, Italy
Development of EEPHC for imaging on large laser facilities

12h15–12h30 **WIGEN NAZAROV** • Univ. St. Andrews, UK, *Production of Laser Targets containing foams: problems, limitations and solutions for present and the future*

12h30–12h45 **CHRIS SPINDLOE** • RAL, UK
Developments for the delivery of advanced laser target designs



12h45-13h00 **General discussion**

13h00-14h30 **Déjeuner -Salons de l'Hotel de Region (1^e étage)**

14h30-16h15 **Workshop – Physics on PETAL-LMJ**

Modérateur : Vladimir Tikhonchuk – CELIA

14h30-14h45 **CHRIS EDWARDS** • HiPER

The next steps of the HiPER programme

14h45-15h00 **SYLVAIN TURCK-CHIÈZE** • CEA Saclay

EOS and spectral opacity measurements for stellar physics with PETAL

15h00 -15h15 **JOAO SANTOS** • — CELIA/Univ. Bordeaux

PETAL and fast ignition

15h15-15h30 **EMMANUEL D'HUMIERES** • CELIA/Univ. Bordeaux

Simulation of secondary sources produced PETAL

15h30-15h45 **ALESSANDRA BENUZZI-MOUNAIX** • LULI laboratory

Recent LULI results on Warm Dense Matter and perspectives with LMJ/PETAL

15h45-16h00 **ALESSANDRA RAVASIO** • LULI laboratory

Laboratory astrphysics: possible developments on PETAL/LMJ

16h00-16h15 **PIOTR RACZKA** • IPPLM Warsaw, Poland

HEDP and FI-related experiments at PETAL using laser-induced cavity pressure acceleration

16h15-16h45 **General discussion**

16h45-17h00 **Coffee break**

17h00-18h40 **Cérémonie de lancement de l'Equipex PETAL+ - Amphi Chaban-Delmas (2^e étage)**

17h00-18h00 **ALAIN ROUSSET** • Conseil régional d'Aquitaine

ANDRE TOUBOL • Délégué régional à la recherche et à la technologie pour l'Aquitaine

BERTRAND GIRARD • CNRS

RADJINI RACINE • ANR

FRANCIS HARDOUIN • Association Lasers et Plasmas

THIERRY MASSARD • CEA/DAM

PHILIPPE BALCOU • Université de Bordeaux

18h00-18h20 **DIMITRI BATANI** • Coordinateur scientifique de PETAL+

Stratégie scientifique, organisation PETAL/PETAL+

18h20-18h40 **LAURENT SERANI** • Chef de projet PETAL+

Objectifs, moyens et calendrier

18h40 **Cocktail – Niveau 2 de l'Hôtel de Région (2^e étage)**



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 14, Rue François-de-Sourdis 33 077 Bordeaux, France T el : + 33 5 57 57 80 41

MEETING OF THE WORKING GROUPS 10 & 12 OF THE HIPER PROGRAMME

9th of December 2011

9.00 - 9.15 **Welcome**

MICHAEL TATARAKIS, COORDINATOR WP12 • INTRODUCTION
DIMITRI BATANI, COORDINATOR WP10 • INTRODUCTION

9h15-10.30 **DISCUSSION OF EXPERIMENTAL RESULTS OBTAINED BY VARIOUS GROUPS IN THE FRAMEWORK OF THE HIPER PROJECT**

Chair :

Benjamin Vazour "The cylindrical fast electron propagation experiment at RAL"
 Maria Richetta "Shock Ignition experiments at PALS"
 Fabien Dorchie "WDM with small and big lasers"
 Yoing joo Rhee "Simulation of high density plasmas of HiPER experiments"
 Milan Kalal "Self-navigation of drivers on injected pellets using SBS PCM"

10h30-10h40 **Coffee break**

10h40-12.10 **DISCUSSION OF EXPERIMENTAL PROGRAMMES WHICH ARE RELEVANT TO HIPER**

Chair:

Philippe Nicolai et/ou Jean-Luc Feugeas et/ou il Jerome Breil CELIA "Future cylindrical experiment at ILE"
 Guy Schurtz "Shock Ignition and PDD on experiments with LMJ"
 Edouard Lebel et/ou Xavier Ribeyre CELIA "Path towards shock ignition with LMJ and preliminary steps with LIL"
 Vladimir Tikhoncuk "LPI problems for shock ignition"
 Jacob Trier Frederiksen "Activities at the Niels Bohr Institute, outline of codes, past, present and future projects"
 Sophie Baton "Shock Ignition Expt at LULI"

12h25-13h00 **General discussion**

13h00-14h30 **Déjeuner -Salons de l'Hotel de Region (1^e étage)**



14h30-15h30 Discussion on the continuation of the HiPER Experimental Programme

Chair:

Dimitri Batani "PETAL, LMJ and WP10 (Fusion Experimental Programme) of HiPER"

Michael Tatarakis "PETAL, LMJ, and the European Laser Park for WP12 (Basic Science) of HiPER"

Francois Amiranoff "The French approach to the Phase 2 of the HiPER programme"

John Collier "Continuation of the HiPER Programme"

15h30-16.45 Discussion on the continuation of the HiPER Experimental Programme

Chair:

16h45-17h00 Coffee break

17h00-18h30 General Discussion

Chair:

18h30 CLOSING OF WORKSHOP