

## **2<sup>nd</sup> Annual Meeting NAUUL - 16<sup>th</sup> June 2011 Salamanca, Spain**

CLPU organized the 2<sup>nd</sup> annual meeting of the Networking Activity on Ultra-High Intensity Ultrashort Lasers (NAUUL) of Laserlab the 16<sup>th</sup> of June 2011 in Salamanca, Spain. The theme for this year's meeting was "New European PW laser facilities: perspectives and challenges". The meeting aimed at bringing together representatives of the main European projects on ultra-high intensity lasers, in order to share and discuss their technological challenges and perspectives for the future. It was attended by:

Luis Roso, *Centro de Láseres Pulsados Ultracortos Ultraintensos, Salamanca, Spain*

Rajeev Pattathil, *Central Laser Facility, STFC, UK*

Christoph Skrobol, *Max Planck Institut für Quantenoptik, Garching, Germany*

Karoly Osvay, *University of Szeged, Hungary*

Georg Korn, *ELI – Beamlines, Czech Republic*

Liviu Neagu, *National Institute for Laser, Plasma and Radiation Physics, Romania*

Jean-Paul Chambaret, *Institut de la Lumière Extrême, France*

Marco Hornung, *Institute for Optics and Quantum Electronics, Jena, Germany*

Mathias Siebold, *Helmholtz-Zentrum Dresden-Rossendorf, Germany*

Nelson Lopes, *Instituto Superior Técnico, Lisbon, Portugal*

This event attracted widespread attention from the local press on the 16<sup>th</sup> and 17<sup>th</sup> of June. An extract of the news (in Spanish) can be found in <http://www.clpu.es/secciones/newsroom.html>

The following is a brief account of the contents of each talk:

### **Luis Roso – The Centre for Ultrashort Ultraintense Pulsed Lasers of Salamanca**

CLPU was presented, describing its situation in the ICTS (Singular Scientific and Technological Infrastructures) roadmap, its organization and structure. A detailed overview was given of the laser systems and the building that will host them. Other activities related to CLPU were presented, like the Master in Laser Physics and Technology, the Latin LaserLab initiative, and the plans to create a lobby of Spanish scientists to prepare a formal bid to host the fourth pillar of ELI in Spain.

### **Rajeev Pathattil – Gemini and Vulcan 10 PW Facilities**

A description of the Gemini facility at Rutherford Appleton Laboratory (UK) was given, highlighting its main technical difficulties, namely, the pointing stability of the twin beams and the pulse contrast. The latter is greatly increased by using double plasma mirrors and low scattering gratings for the compressor. The plans to upgrade the existing Vulcan 1 PW facility to 10 PW was also presented, consisting in an additional amplification stage based on OPCPA technology.

### **Christoph Skrobol – The Petawatt Field Synthesizer**

A detailed account of the progress on the Petawatt Field Synthesizer at the Max Plank Institut für Quantenoptik, Garching, Germany was presented. Its approach, based on OPCPA chains allows reaching the PW power in laser pulses as short as 5 fs.

### **Karoly Osvay – ELI – Attosecond Light Pulse Source**

The Hungarian site for ELI was presented in this talk. ELI-ALPS will specialize in attosecond light beams. The overall cost of the site will be 244 € and it will be developed by three different Hungarian institutions. The site is scheduled to be operative by the end of 2015 and therefore the

choice over the equipments will be done based on currently tested technologies. The scientific case includes time resolved studies of dynamics of valence and core electrons, sub atomic 4D imaging, and the production of secondary beams of light and particles.

### **Georg Korn – ELI - Beamlines**

The talk started with a presentation of the White Book of ELI which provides all the technical information about the project. The ELI site in Czech republic will focus mainly in secondary particle sources. The most interesting ones are the 2 GeV electron source at 10 Hz, and >10 GeV at lower repetition rate. A proton source will produce some 200-400 MeV particles at 10 Hz, and > 3GeV at lower repetition rate. The applications range from K alpha sources, betatron radiation, x-ray free electron lasers, etc. The project will incorporate technology currently under development and is also expected to boost the diode pump technology.

### **Liviu Neagu – PW laser systems at NILPRP – Bucharest**

The National Institute for Laser, Plasma and Radiation Physics of Romania is setting up a PW laser facility called CETAL, with 30 J, 30 fs pulses at 0.1 Hz, provided by the company Thales. Romania is also the planned host for the ELI – Nuclear Physics facility. This will consist of two 10-PW lasers plus a high-brilliance gamma ray source. Regarding the technology of the 10 PW lasers, the ELI-NP team is considering three options: (i) two Apollon-type lasers; (ii) two National Energetics type lasers (with a combination of different types of crystals); or (iii) one of each. The advantages and disadvantages of each option was discussed.

### **Jean-Paul Chambaret – Apollon/ILE 10 PW Laser Project**

The Institut de la Lumière Extrême (ILE) in Paris is developing its own 10 PW Laser Project called Apollon. It relies on Ti:Sapphire technology with large size crystals, large size monolithic gratings, and a pumping architecture based on a few high energy (up to 100 J) green lasers.

### **Marco Hornung – The Polaris Laser**

The Polaris Laser in Jena, Germany, is a fully diode pumped laser which uses the Ytterbium doped crystals as the active material. The architecture consists in a series of amplifiers with increasing energy. Today the amplifier A4 made of forty diode stacks is functional and the next step called A5 is under construction. This laser will deliver pulses of 1 PW and will serve as a proof of principle of the diode pump technology for high power lasers.

### **Mathias Siebold – Draco Upgrade and the Diode Pumped PW Laser Penelope**

Helmholtz-Zentrum Dresden-Rossendorf operates the 150 TW Ti:Sapphire laser Draco for electron and ion acceleration experiments. A brief overview of its activities as well as plans to upgrade Draco to 500 TW was presented. There are also plans to build a 1 PW laser system based on diode pumped Yb:CaF<sub>2</sub> crystals. A detailed account of the performance of these crystals was given.

### **Nelson Lopes – High power laser research at IST**

The IST activities on laser plasma physics were presented in this talk. The two main activities are the large simulation code OSIRIS and the plasma laboratory where they specialize in large channel formation. The most important activities are dedicated to build long channels of plasma for electron acceleration. New plans at IST include expanding the current installations and renewing the current equipment.

## Round Table

After the talks a debate between the speakers and the audience was arranged and moderated by Camilo Ruiz (CLPU). The subjects discussed included:

- The limits and perspectives of Ti:Sapphire technology.
- The architecture of compressors.
- The need of a standard method for measuring pulse contrast.
- Radioprotection schemes.
- Human resources issues.

The presentations will soon be available for registered users in the NAUUL section of CLPU's website.

## Picture gallery

