

OPCPA

A training session organized by University Bordeaux, CELIA and PYLA.
Sponsored by CNRS and Laserlab Europe



Objectives

- Acquire the basic concepts in optics and non-linear optics and understand parametric processes
- Learn how to simulate and design parametric stages (SHG, OPO, OPA, OPCPA)
- Get an overview of state of the art achievements with OPCPAs
- Build a network of users within the European community and exchange knowledge and how-to among the participants. Initiate collaborations.

Duration

- Lectures: 2 days. Hands on training: 1 day

Prerequisites

- Degree in lasers and optics

Public

- Users or designers of high intensity/high energy/high average power lasers based on optical parametric processes
- Technicians, Engineers, Researchers
- Undergraduate and PhD students

Dates

- Lectures: 19-20 January 2015
- Lab work: 21 January 2015 (limited to 20 people)

Venue

PYLA/University of Bordeaux

Teachers

- A. Baltuska (TU Wien)
- J. Biegert (ICFO Barcelona)
- D. Bigourd (FEMTO-ST, Besançon)
- E. Cormier (CELIA, Bordeaux)
- JC. Delagnes (CELIA, Bordeaux)
- F. Druon (IOGS Palaiseau)
- J. P. Goossens (CEA Cesta)
- F. Legaré (INRS Montreal)
- J. Limpert (IAP Jena)
- C. Manzoni (Politecnico Milano)
- G. Mennerat (CEA Saclay)
- S. Weber (CEA Saclay)

Program

Basic concepts:

- Ultrashort pulse propagation, dispersion, CEP
- Principles of linear and non-linear optics. Second or third order susceptibility. Phase matching. Non-linear processes (SHG, DFG, OPA, ..., SPM, XPM, XPW, 4WM ...)
- Architectures involving parametric amplification processes associated with second order (3 wave mixing) and third order (4WM)
- Non-linear materials (crystals, glass, fibers, ...)
- Simulating parametric processes (SNLO, Commod Pro, MIT, 2D, 3D, ...)

OPA based systems:

- High energy and high average power SHG
- MidIR ultrashort pulses at 160 kHz (Nd:YVO₄ pump source)
- 2 cycles at 2 μm at 100 kHz (Yb-fiber pump source)
- High-energy OPCPA at 3.9 μm (Nd:YAG pump source)
- 4.5 fs 20 GW at 800 nm (Yb-fiber pump source)
- OPCPA front-end for PETAL 10 PW laser (Nd:glass pump source)
- Fiber OPA (Yb-fiber pump source and non-linear medium)
- Fourier Domain OPA (Ti:Sapphire pump source)
- Visible OPA
- High-intensity / high-energy OPCPA
- High-contrast OPCPA front-end

Lab work:

- Simulations
- Frequency doubling, phase matching, angular-spectral-temperature acceptance,
- Supercontinuum generation and DFG
- CEP control and measurement
- OPA
- Fiber OPA
- 4WM
- ...

Registration fees

French VAT included (20%)

	Lectures (2 days)	Lectures + Lab work* (3 d.)
Full registration	600 €	840 €
Academic	340 €	480 €
Undergraduate & PhD students	250 €	350 €

* Lab work is limited to 20 people (the 20 first applications will be registered. If 15 more applications are received, an additional training day will be organized)

Training session chair

- **Pr. Eric CORMIER**, CELIA, Bordeaux University, Scientific Director of PYLA
e.cormier@pyla-routedeslasers.com

Coordination

- **Sonia GEAY**, PYLA
+33 (0)5 57 01 74 00
s.geay@pyla-routedeslasers.com

