

# OPCPA

3 DAYS (21H)

Ref. LSL-07en

## 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.

## 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

## TOPICS

### METHODS AND EDUCATION TOOLS

- Theoretical background
- Practice and Lab
- Computation and simulations

## TRAINING SESSION CHAIR

Pr Eric CORMIER - Bordeaux University, CELIA

## PROGRAMME

- 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:YVO<sub>4</sub> 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

## METHODS AND EDUCATION TOOLS

## + D'INFOS

- Venue :Bordeaux University
- Dates : contact us
- Registration fee : contact us