

# Optical Parametric Chirped-Pulse Amplification - OPCPA

3 DAYS (21H)

Ref. LSL-17

## OBJECTIFS

- To provide a basic knowledge in both linear and non-linear optics
- To understand parametric process
- To learn how to simulate et design the various stages involved in parametric amplification (SHG, OPO, OPA, OPCPA)
- To present state-of-the-art OPA and OPCPA devices
- To foster a network at the national and international level
- To facilitate the exchange of knowledge and to share know-how between the attendees

## PUBLIC

- Users or designers of high-intensity, high-energy or high average power lasers
- Technicians, engineers, researchers
- Undergraduates and Ph.D. students

## ÉVALUATION

- Assessment
- Certificate of completion

## INTERVENANTS

- Internationally renowned speakers experts in their field

## 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 ;  
Architectures involving parametric amplification processes associated with second order and third order ;  
Non-linear materials ; Simulating parametric processes
- OPA based systems  
High energy and high average power SHG ; MidIR ultrashort pulses at 160 kHz ; 2 cycles at 2  $\mu\text{m}$  at 100 kHz ; High-energy OPCPA at 3.9  $\mu\text{m}$  ; 4.5 fs 20 GW at 800 nm ; OPCPA front-end for PETAL 10 PW laser ; Fiber OPA ; Fourier Domain OPA ; 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

## MÉTHODES & MOYENS PÉDAGOGIQUES

- Lectures
- Hands on training
- Calculation and simulations

## + D'INFOS

- Location : University campus Bordeaux-Talence (33)
- Dates : 1 session/year - contact us
- Prerequisite : Degree in physics
- Fee : 2 620 € HT