Éducation et culture
Éducation et formation tout au long de la vie
ERASMUS

ERASMUS Intensive Program
USIL 2010 Bordeaux University
Ultrashort and Intense Laser Technology and Metrology

November 29 – December 10, 2010

Salle de Conférence PYLA
Centre Technologique Alphanov, Bât A11, 2ème étage

Plateforme de formation OPTIQUE, LASER & ENVIRONNEMENT CONTRÔLÉ

Plateau pédagogique : Bât A11 - 351 cours de la Libération - 33405 TALENCE CEDEX

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PROGRAMME
WEEK 1: November 29 – December 3

Ultrashort Lasers

Monday nov, 29th	AM PM	• Base of Linear and nonlinear optics • Laser Theory 1. Principle of operation • Laser Theory 2. Spatial characteristics of Lasers • Laser theory 3 Mode locking techniques • *Numerical activities:* Laser simulation and Laser propagation
Tuesday dec, 30th	AM PM	• Ultrashort laser oscillators : Materials (including fiber) and pumping sources • *Practical Labs* : Ti saph and Yb KGW femto oscillators : performances and limits
Wednesday dec, 1st	AM PM	• Laser Amplification • Amplifier architecture • Pumping sources and performances • Limitations and contrains • *Practical Labs :* Regenerative amplifier, Fiber amplifier
Thursday dec, 2nd	AM PM	• Advanced nonlinear Optics • Non linear technique of Amplification : NOPA and OPCPA • Tunable femtosecond laser sources • *Practical Labs :* Demonstration of non linear amplification & conversion
Friday dec, 3rd		• Visit of large Laser installations : CELIA/CPMOH-COLA (CEA) ALISE • Training evaluation

PROGRAMME
WEEK 2: December 6 – December 10

Metrology and Applications

Monday dec, 6th	AM PM	• Laser field representation • Laser parameters: what to measure? • Optronics detectors: elementary bricks • *Numerical activities:* time space representations
Tuesday dec, 7th	AM PM	• Time frequency metrology amplitude and phase : principales and limitations • Time frequency measuring techniques • *Practical Labs*: autocorrelations and frequency time technique (Spider…) • *Industrial workshop: demonstrations and discussions*.
Wednesday dec, 8th	AM PM	• Spatial metrology in amplitude and phase: principles and limitations • Laser spatial control and shaping • *Practical Labs:* spatial measurements (HASO, interferometric, propagation…) Demonstration of adaptative optics for laser beam control

Thursday dec, 9th	AM
	
	PM
		• Intense laser fields applications seminars
		  • High harmonic generation
		  • Petawatt domain
		  • Secondary sources
		
		• Discussion and round table on applications

Friday dec, 10th		• Practical labs: Complex metrology at large laser facilities: work at COLA's platforms CPMOH/CELIA Bordeaux1 • Training Evaluation