Route des Lasers

THE PLACE TO BE

The Bordeaux photonics cluster

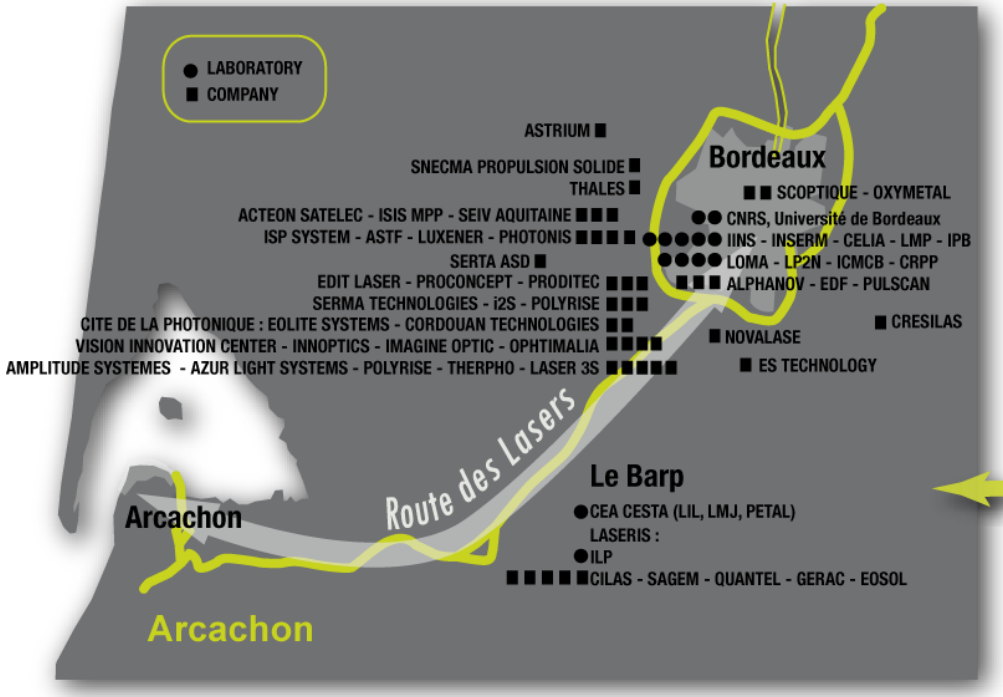
1. Route des Lasers Competitiveness cluster

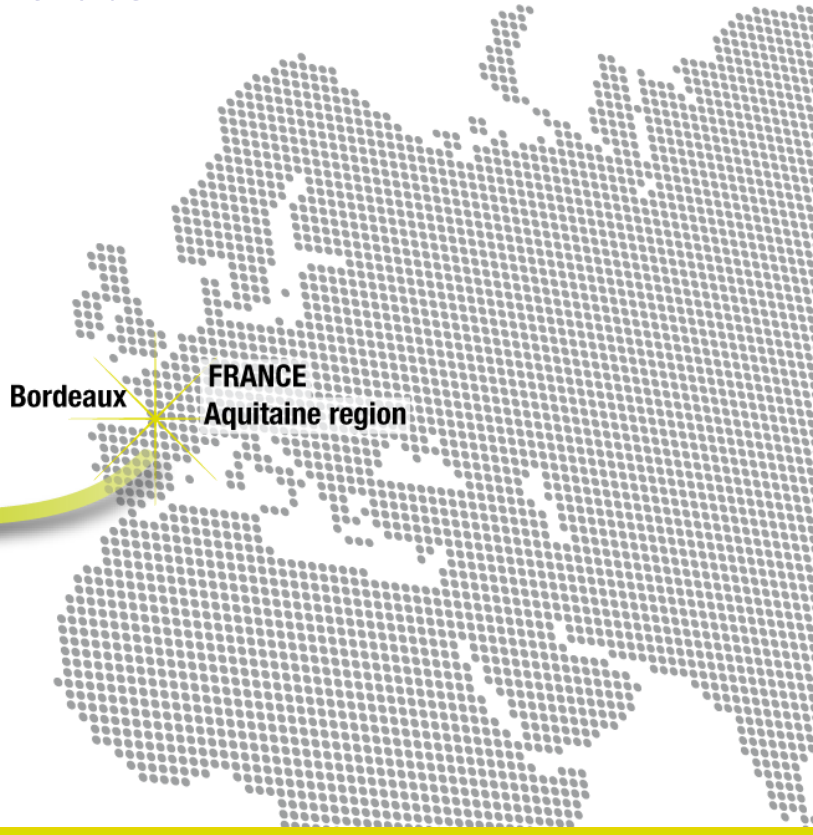
2. A Photonics Region

3. The Cluster's Projects

Bordeaux Route des Lasers competitiveness cluster

- **Governed by ALPhA** – Aquitaine Lasers Photonics and Applications
- **A concentration of expertise and skills**
- **Around 100 members from industry and academic labs**





80 Innovative companies in photonic technologies

- **A network of SMEs** working with optical-photonic technologies and lasers
- **Leading corporate groups** (CILAS, SAGEM / SAFRAN, QUANTEL, THALES)
- **Main applications concerned:**
  - Aeronautics and Space
  - Embedded systems
  - Instrumentation, Metrology
  - Health
  - Agribusiness
  - Energy: thermic solar, photovoltaics
  - Technologies and sustainable development
  - Industrial processes
- **Expertise:**
  - Laser sources
  - Fiber lasers, high-power and high-energy lasers
  - Metrology and imaging, Terahertz applications
  - Instrumentation
  - Digital vision systems
  - Virtual reality
  - Components and materials

One of Europe's highest concentrations of scientific expertise in photonics

- **International reputation laboratories**

  CELIA, CEA, ICMCB, LOMA, LP2N, IMS...

- **Research centered on optics and lasers**
  - Short-pulse lasers
  - Intense lasers
  - Nonlinear optics
  - Spectroscopy
  - Laser-plasma interaction
  - Inertial confinement fusion
  - Optics equipment
- **Multidisciplinary fields**

  Nanophysics, bio-photonics, image processing

- **Collaborative R&D projects**, bringing together industrialists and researchers.

Photo: ALPhANOV

Photo: BIC / Arthur Péquin

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Laser Megajoule (LMJ), a scientific flag for global visibility

Route des Lasers

cea

energie atomique • energies alternatives

- **An exceptional research equipment,** only comparable in the world to the National Ignition Facility (NIF), in California
- **Extreme physical conditions** (millions degrees and tenths millions bars in billionths seconds)
- Soon achieved at the **CEA CESTA** site (Bordeaux area)
- Designed for nuclear deterrence and openly available for use by the **French and International scientific communities**
- **Its prototype, the Laser Integration Line (LIL)** already the most powerfull laser in Europe in terms of energy delivered

Photo: CEA / Hubert Raguet

Photo: CEA / Vertigo

PetaWatt Aquitaine Laser (PETAL), a coupled scientific instrument

Route des Lasers

- **A High Energy Multi-Petawatt Laser** to explorate new high-potential research areas
  - Clean power production (inertial confinement fusion), understanding of the universe, extreme physics and medical science
- **A demonstrator** of physics and laser technology **for the European facility HIPER** (High Power Laser Energy Research)
- Generating pulses of up to 3.5 kJ during 0.5 to 5 ps, coupled with the high power laser LIL (60 kJ, 8 beams, ns, 3ω)

Petal
PETAWATT AQUITAINE LASER

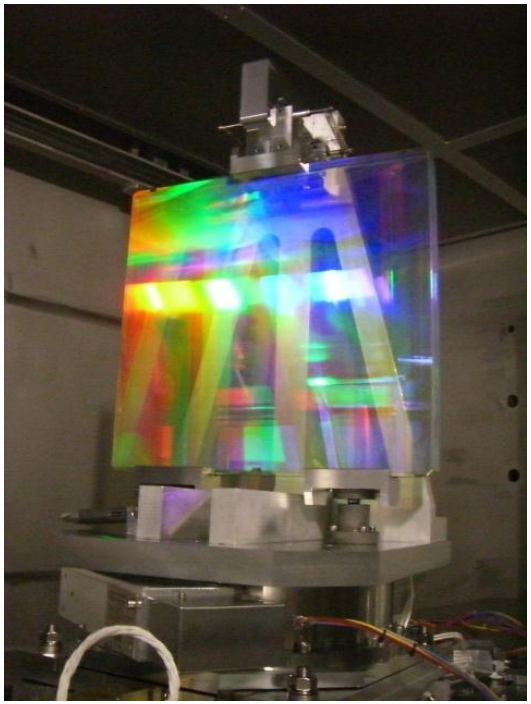

Photo: CEA / Philippe Labeguerie

REGION AQUITAINE

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INSTITUT LASERS ET PLASMAS

HiPER

ALPhANOV, Optics & Lasers Technological Resource Center

- **25 people** (employees, PhDs, engineers and technicians)
- **1.000 m² of specialized premises** at the University of Bordeaux
- **15 lasers**, from continuous to Femtosecond
- **State of the art instrumentation**
- **400 contracts per year**
- **CRT quality label** (technological resource center)
- **Clients ranging from** large companies to SMEs and start-up:
  - Aeronautics, space, defense
  - Electronics, microelectronics
  - Instrumentation, sensors
  - Chemicals, pharmaceuticals, health
  - Luxury goods, cosmetics
  - Energy, Photovoltaics

ALPhANOV
Optics and Lasers Technological Center

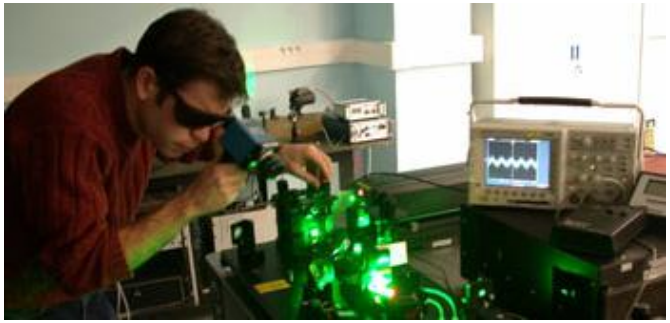

Photo: ALPhANOV

CRT CENTRE DE RESSOURCES TECHNOLOGIQUES

↑ BACK

PYLA, Optics & Lasers Training Center

- Sharing the skills of academic and industrial partners in **a joint catalog of optics and laser training programs**
- From 2 to 8 days training courses with **expert speakers on dedicated facilities**
- **Over 40 training courses:**
  - Basic knowledge
  - R&D
  - Laser security
  - Industrial lasers
  - Medical lasers (DIU Laser & Medicine)
  - Ultracleanliness
  - Intensive programs (Ultra Short and Ultra Intense Laser Sources, Optical Metrology and High Fields Physics)
- **Training sessions on request,** regarding to special needs (onsite or inter companies)

Photos: PYLA / ALPhANOV

↑ BACK

Bordeaux IOGS

- Starting in 2012, **a branch of the Institut d'Optique Graduate School (IOGS)**, associated with the University of Bordeaux:
  - 250 people in teaching and research
    - 100 student-engineers (competitive exam + international)
    - 50 masters students (international + French)
    - 60 doctoral and postdoctoral students
    - 30 instructor-researchers
    - 10 technical support and administrative personnel
- **Original and exclusive themes**
  - Optics and digitization
  - Optics, nanosciences and complex systems
  - Optics and neurosciences
- **Located in the new "Centre optique" building** (14.000 m²) on Bordeaux University campus

Future IOGS / ALPhANOV / PYLA center – Aquitaine Region
Architects: Nicolas Ragueneau, Antoine Roux

↑ BACK

SEML Route des Lasers, a dedicated real estate

- A range of business and technology sites, in particular those **suited to industrial needs**
- Shared services and resources
- Two parks dedicated to the optics-laser sector:
  - Near the Laser Megajoule: **LASERIS 1** scientific & technological park for industry, and **LASERIS 2**, for industry related services
  - Near the university campus: **Cité de la Photonique - Unitec** brings together industrialists and research laboratories in the sector

LASERIS park and
Khara building (Cité de la Photonique – Unitec)
Photo: SEML Route des Lasers

Invest in Photonics ®, the international partnering convention

- Facilitating the meeting between:
  - Entrepreneurs and Executives of emerging companies (energy, environment, telecoms, health, industry, consumer technology…)
  - Investors and Analysts working in the entire photonics applications sector
- Addressing the current business issues facing the industry with opinion leaders
- Increasing the visibility of the Photonics Industry
- An International organizing committee
- 3rd edition in preparation for 2012

Invest in Photonics 2010, Market Time

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3. The Cluster's Projects

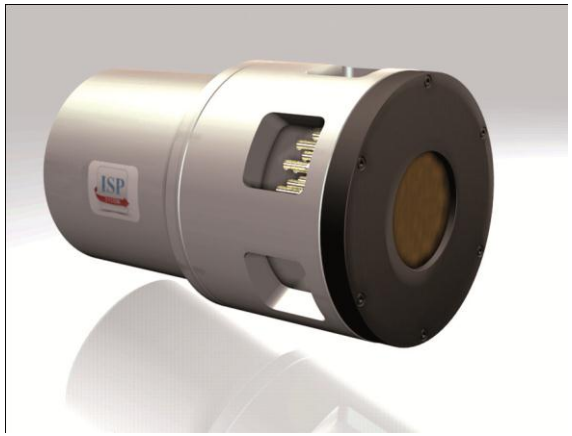
Research / Industry projects - Grants management

- **Competitiveness cluster project support: core of "Route des Lasers" action**
  - Projects identification & setting up
  - Projects labeling
  - Projects coordination
  - Projects follow up

- **Competitiveness cluster grant management:**
  - **French Ministry of Industry (FUI projects):** 2 AAP / year, support and labeling
  - **French Ministry of research (ANR projects) :** financial bonus (6%) through labeling
  - **Investment for the future:** R&D structurant, PFMI, IRT….
  - **Aquitaine Region industrial and R&D projects :** strategic development, bonus through labeling
  - **European projects (FEDER, FP7, Eureka…) :** support and project development

Some “Route des Lasers” projects

- **CALAS:** Laser ignition
- **EFESO:** Polishing techniques for high precision optics
- **ULTRASTENT:** Laser micro-milling of cardiac implants
- **PLUS:** Sight positioning in aeronautics helmets
- **CLEANLASE:** Laser cleaning
- **MEDOXIS:** Laser instrument for eye surgery
- **TERABOOK:** Advanced document digitization technology
- **HIPAO:** Adaptive optics for power lasers
- **LNP KEY**: Laser nanoparticles fluorescence for traceability in the wood industry
- **ISOCEL** : Innovative solar cells in Aquitaine

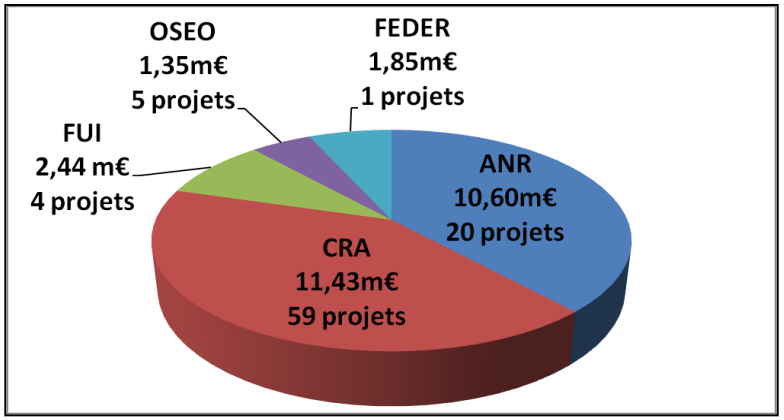


Projet HIPAO
Photo: ISP System

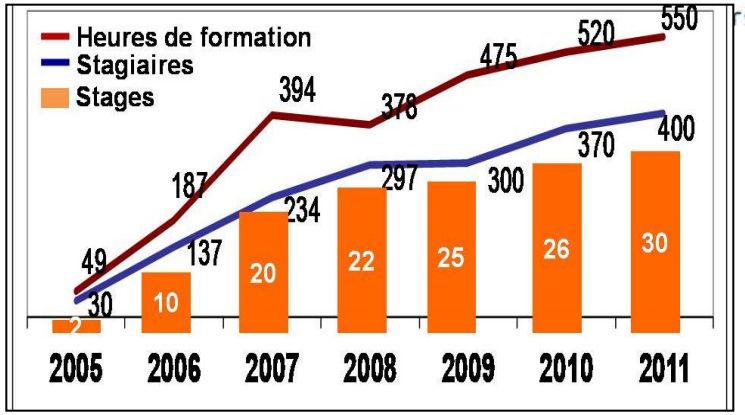
Projet CALAS
Photo: Turbomeca

Summary

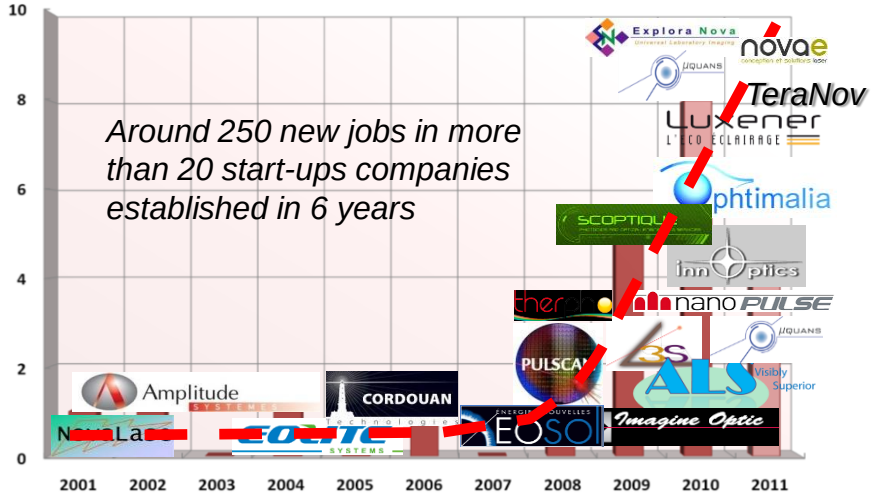
Key figures:



2005 - 2010 Collaborative projects



In-service Training



Start-ups / new setting up companies

Exhibition shows participation

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