OPTICS-PHOTONICS IN PROVENCE

Land of light, Provence has always inspired artists and photographers. The first film in the world was shot in la Ciotat by the Lumière brothers. Our present bears withness to this past : today, the region Provence-Alpes-Côte d'Azur is the second region in France for optics.

Areas of excellence

-Aerospace
-Environment
-Instrumentation & Earth observation
-Submarine optics
-Nuclear fusion
-Microelectronics
-Medical imaging
-Bio-photonics
-Laser processes

Key Figures

- 80 companies
- 25 laboratories
- 4 5020 qualified jobs (including 1500 researchers)
- GDP of this sector in PACA : €720 million
- 20 % of French R&D in optics

A site dedicated to industrial innovation : the Marseilles-Provence Technopole in Château-Gombert

- First French site dedicated to energetic mechanics, optics-photonics and astronomy.
-The Marseilles-Provence Technopole provides a system of reception to accompany a business through all the stages of its development, from innovation and creation of new products through to industrial production.

An industry in full light

Provence, with 80 companies in the sector, represents one of the most important regions in France in terms of optics, electro-optics and image processing, with leading positions in the fields of aerospace, microtechnology, medicine, telecommunications, energy and industrial equipment.

A leading edge research and international programs

In the region, more than 1500 researchers are working directly in the optics, electro-optics and image processing sector in laboratories that enjoy international reputations: The National Center for Scientific Research (CNRS), the Fresnel Marseilles Institute, the Marseilles Astrophysics Laboratory, the Lasers Plasmas and Photonic Processes Laboratory (LP 3), ONERA, the French atomic energy commission (CEA), CEMAGREF, CP2M…
These laboratories play a leading role in international research and important facilities like Antares, submarine telescope, ITER, nuclear fusion experimental reactor in Cadarache.

Among the companies in the optics, electro-optics and image processing sector in Provence : Bertin Technologies develops industrial electro-optics and visionics systems, Vegatec specialises in ultra-high vacuum and Test innovation technologies in the design and manufacture of special equipment. The group High Wave, by taking over the company Chakti, has set up in Aubagne to produce built-in components for its optical amplifiers and multiplexers, Efer is working on the miniaturisation of endoscopic video and the integration of measurement processes, Synapsis is perfecting its apparatus for the operational investigation of vertigo, Sopro, its medical exploration equipment and Chromasys, its on-line colour testing. Other examples include Light Technologies, in the field of opto-electronic design using diodes and Opal, in infrared optics. Stil operates in the field in instrumental optics, Sageis in opto-electronics and Simag in perfecting a product for the development of intelligent cameras. The aerospace industry, an important consumer of optical components, is present in the shape of Eurocopter, Dassault Aviation, and Thales Alenia Space.

Some examples :

Seso
Recognised as being one of the world leaders in X-ray mirror technology, this company based in Aix-en-Provence designs and industrialises opto-mechanical and electro-optical systems. At present it is preparing for the turning point in EUV lithography.
www.seso.com

Cybernetix
Located in the Technopole of Château-Gombert (Marseilles), this company's activities lie in the field of innovative engineering and the production of industrial equipment (semi-conductors, microchip cards, postal sorting, robotics). Its vision/metrology department is specialised notably in real-time measurement in difficult environmental conditions.
www.cybernetix.fr

IBS
The customers of this specialist in customised ionic implantation include the biggest manufacturers of microelectronics components. It has created Silios Technologies, located in the Rousset industrial Zone, which specialises in the integration of optical circuits using proprietary technology.
www.ion-beam-services.fr

A competitiveness Cluster : POPsud

POLE OPTIQUE & PHOTONIQUE

R&D and transfer activities

At the instigation of POPsud, more than 20 projects of shared scientific and technical equipment have been created in common by thirty companies and twelve laboratories.

Example: the "Vimos" project, which originated at the Haute Provence Observatory. The conception of the giant spectrograph required five years of work and study from a French-Italian consortium comprised of scientists and industrialist from our region of Italy. The three-ton device will equip the Chilean observatory, European Austral Observatory, with the largest telescope in the world.

Training : A Path to Excellence
One of the best training programs in optics is offered at the Ecole Centrale Marseille, which prepares its students for a Masters of Research in optics and image treatment, and for several years it has offered a Masters of Science through a European partnership (Europtics). Intermediate level studies are also offered, such as a Professional degree in professional optics at the Technological University Institute (IUT) of Saint Jérôme, or an Advanced Technical Certificate (BTS) in instrumental optics at the technical high school of La Joliette in Marseille.

Interview with Professor Mr. Charles OLIVER, Coordinator of CERIMED.

Can you tell us about the CERIMED project?

CERIMED is a multidisciplinary centre for the development and validation of new medical imaging technologies (optics, ultrasound, x-rays, nuclear medicine) in line with the needs of clinical services and biomedical research, with the following aims:

- to carefully develop technologies with a minimum of patient risk;
- to develop technologies that are usable across the full range of pathologies;
- to open up the Centre and provide access to its resources for the scientific, biological, and medical community.

The Centre will initially focus on oncology and cardiovascular physiology. **CERIMED**'s objectives are also to lead and coordinate research across Europe into generic technologies, and to implement introductory courses in physical science for students in health studies and biology, and introductory courses in medical science for students of physics and physicists.

What are the main reasons for choosing Marseille?

In that regard, the fact that **CERIMED** originated in Marseille is a great advantage since the city has many very fine laboratories that are well respected in the world scientific community, such as:

- The CPP (*Centre for Particle Physics*);
- The Institut Fresnel for optics;
- The LMA (*Mechanics and Acoustics Lab*);
- The LP3 (*Lasers, Plasmas and Photonic Procedures*);
- Some very efficient biology labs;
- University Hospital Services of Marseille;
- The IPC (*Institut Paoli Calmettes*), cancer centre.

cerimed
www.cern.ch/cerimed/

What are the advantages highlighted for soliciting international participation?

- its originality regarding its availability to all laboratories working in medical imagery;
- its unique quality illustrated by allowing interdisciplinary interaction between physicians, biologists, and doctors;
- a research clinic executed within a very regulatory and formal framework like the CIC (*Centre Of Clinical Investigation*) of Marseille which is part of the European Network of Clinical Research (*ECRIN*).

The scientific community (*European especially, but international as well*), recognizes the value of this project due to its many important advantages. Financed by the CPER (*State-Region Project Contract*), **CERIMED** headquarters should be completed by the end of 2010.

For further information : http://cerimed.web.cern.ch

Supersonic Imagine is developing an ultrasound technology that provides a revolutionary therapy for the treatment of cancer.

This venture all started with Jacques SOUQUET's need to go back to his roots. He has worked in the United States for twenty two years as the Director of the world-wide research team at Philips Medical and now wishes to go back to France and set himself up in Provence.

In order to develop this project, based on a highly innovative technology, he needs support. His meeting with the Home Sweet Home team at Provence Promotion in 2005 is key for obtaining subsidies and facilitating the return to France of French researchers working in the USA as well as bringing US researchers to France.

This start-up business is now based in the Duranne enterprise zone and is developing a revolutionary medical technology based on elastography, a process that can measure and visually represent the smallest changes in tissue elasticity/stiffness. This new process is an advancement in the diagnosis of some pathologies and in the future it will be possible to use it for the non-invasive treatment of tumours A second injection of funds is taking place which should enable the business to increase its investment in research as well as in the development of marketing and sales for products that result from this research.

This new company fits perfectly into the economic and scientific environment of Provence and has been able to establish extremely good links with the clinical services, in particular the hospital complex of La Timone.
With the honour of the regional "Créa13" and "Special Eurocopter" prizes in November 2007, Supersonic Imagine is certainly sure of a bright international future.

SUPERSONIC imagine
The Theragnostic Company™

PROVENCE PROMOTION: HELP FOR ESTABLISHING IN THE REGION

Provence Promotion is the Bouches-du-Rhône Economic Development Agency, created by the Chamber of Commerce and Industry for Marseille-Provence and the General Council. Provence Promotion's vocation is to promote the setting-up of new businesses, either French or foreign (research companies to acquire, research land, grants and subsidies, market elements, recruiting…).
Its mission is free and confidential and involves :

- Offering a unique negotiator for assistance, support and development during the different stages of a project (Regulations, application formalities, financing assistance and subsidies…),
- Providing relevant economic data ad fiscal and financial information,
- Studying and bringing together the relevant partners,
- Supporting companies and employees with their integration to a new environment. These skills are developed in direct collaboration with the region's economic contributors.

PROVENCE Promotion

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