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NEWS
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FOCUS ON OPTICS IN PROVENCE

SYNERGIES

A NEW HOME FOR PROVENCE'S OPTICS INDUSTRY: THE "HOTEL TECHNOPTIC"

"Here in Provence, the light sciences are paving the way to the future world." An interview with Christian Rey (Marseille Innovation)

The Hotel Technoptic business services center opened recently. What is its purpose?

Christian Rey: This new building is a one-stop center for optics and photonics sector companies and based at the Marseille-Provence Technopole technology park at Château-Gombert. It serves three main functions: enterprise incubator, business services center and technology hub and already has half a dozen companies set up within its walls. The incubator is managed by Marseille Innovation.

Why set up a design support center for optoelectronic products within the Hotel Technoptic?

Christian Rey: It's a hub that will complete the current range of services offered to start-up entrepreneurs and that is aimed at helping companies produce prototypes in small quantities. With its services in the fields of design, prototyping, eco-design and marketing, the center allows entrepreneurs to shorten their time-to-market and reduce costs to a minimum. Furthermore, its scope is not limited to France; indeed, the center has just signed a framework agreement with the Tunisian Agency for the Promotion of Industry and Innovation covering preproduction runs of industrial components within a secure environment and works alongside Provence Promotion to enhance the attractiveness of Marseilles to potential investors.

Bringing optics applications into the public eye is quite a challenge for Marseille Innovation. What means have you put in place to do this?

Christian Rey: We intend doing it in several ways. Firstly, 2013 -the year Marseilles takes over as European Capital of Culture- could well represent a springboard for the region's optics industry. With this in mind, an agreement has been signed with the city council to use the city as a vast, open-air experimental laboratory in which to showcase products that are "Made in Marseilles". Consequently, the enterprise incubator is setting up a demonstration showroom for innovating products made by its residents. Lastly, the Marseilles-based association Lumicom, which is actively involved in highlighting the architectural, artistic and cultural heritage of towns and cities through the use of lighting, will be contributing to the promotion of the region's know-how through its lighting of the Technoptic building. The optics-photonics industry is a sector of excellence with considerable potential and which has applications in numerous fields in the PACA Region. Our mission is to bring to the attention of the widest possible audience the applications research in this domain has. www.marseille-innov.org

OPTICS AND R&D IN PROVENCE

THE INVISIBILITY CLOAK : WHEN FACT MEETS FICTION

A recurrent theme in mythology and literature, the ability to become invisible has fascinated man throughout history. From the Greek god Hermes to J.K. Rowling's Harry Potter, examples of heroes able to elude the eye abound. However, what was once consigned to the realm of science fiction is about to become fact, thanks to work being carried out by Marseilles' Institut Fresnel.

Make a solid object invisible: This is the ambitious target set by the team of Marseilles-based researchers that has been working since 2006 on perfecting a device known as an "invisibility cloak," made from a metamaterial. The theory is simple: Deviate light waves in such a way that they go around the target object placed in the device and resume their normal path as if the obstacle in the light's way wasn't there, in the same way water in a river flows around a stone and resumes its flow direction.

A prototype structure has been designed in the form of an "invisibility cylinder" for surface plasmons in wavelengths at the edge of visible light (of the order of 800 billionths of a meter).

Even if work is still at the theoretical stage, this major breakthrough could have applications in the fields of telecoms, aeronautics, earthquake proofing and even acoustics. <http://www.fresnel.fr/>

MARSEILLES ASTROPHYSICS LABORATORY (LAM) TAKEN ON BOARD EUCLID MISSION

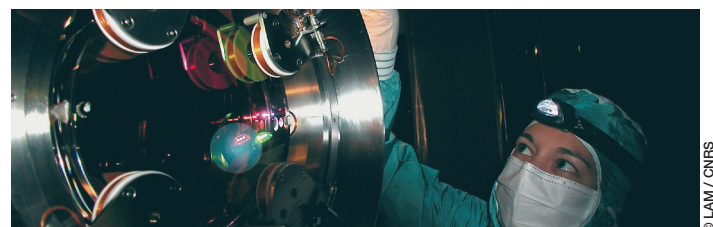
The Marseilles Astrophysics Laboratory (LAM) has been selected to take part in the European Space Agency's EUCLID mission due to be launched in 2019.

An emblematic component of the ESA's Cosmic Vision 2015-2025 program, the mission's aim is to provide better insight into the origins of the universe's accelerating expansion.

To this end, EUCLID should enable scientists to draw up a map of the universe's dark matter using the on-board systems, including a visible spectrum (VIS) camera and a near-infrared imaging photometer (NIP).

These observation instruments have been developed by a European consortium headed by the Paris Institute of Astrophysics and the Marseilles Astrophysics Laboratory (LAM). The Marseilles-based researchers are involved in preparing the science aspect of the mission, instrument design and analysis of the retrieved data.

Seven hundred persons are involved in this €800 M program Europe-wide, approximately 50 of them in this region. <http://lam.oamp.fr/>



TESTIMONIAL

The First Light Imaging story

FIRST LIGHT IMAGING'S OCAM2 OPENS UP NEW HORIZONS FOR ASTRONOMY

The result of five years' collaboration between the ESO (European Southern Observatory) and three CNRS-INSU laboratories, the OCAM2 camera is a piece of technological wizardry designed for use with adaptive optics in the field of astronomy.

Revolutionary, and with no equivalent anywhere else in the world, this new faint light camera is a vital component in correcting images distorted by the turbulence of the Earth's atmosphere and captured by very large-sized telescopes.

The OCAM2 camera is highly sensitive and able to take 1500 images per second in almost total darkness. *"The previous generation of cameras was three times slower and had four times fewer pixels. The technological leap made with OCAM2 opens up new avenues for instrument-based research in astrophysics and opens the way for future telescopes with 30 or 40 meter diameter mirrors,"* explains Jean-Luc Gach, the father of this revolutionary device.

It was to market the high-precision camera that First Light Imaging, an offshoot of the Laboratoire d'Astrophysique de Marseille (LAM), was set up in 2010.

The start-up's aim is to establish itself as a leader in the field of adaptive optics for very large-sized telescopes and in fact it recently supplied two OCAM2 cameras for the GranTeCan (Gran Telescopio Canarias),



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the world's largest single-aperture optical telescope, located in the Canary Islands.

With the lead it has over its competitors, the OCAM2's successful future is assured. Indeed, its innovating technology has applications in numerous fields including biomedical imaging, high-risk site surveillance and defense.

First Light Imaging is currently working on a prototype designed to detect debris on airport runways, a project carried by Aeromecanic in Marignane and certified by the Pégase and Optitec competitive clusters. Operational trials at Marseille-Provence airport are scheduled for the beginning of 2012. Furthermore, studies are under way to develop new camera versions with, for example, a throughput of 2000-2500 images per second or sensitivity to infra-red wavelengths.

www.firstlight.fr

MAJOR PROJECTS

FIRST STONE LAID AT CERIMED

Work on the European Centre for Research in Medical Imaging (CERIMED) got under way on November 17 last. This major project is being carried by Aix-Marseille University and is supported by the competitive cluster OPTITEC. The 26,500 sq. ft. building will be located on the La Timone university site, close to laboratories carrying out research in the fields of neuroscience, cancerology and cardiovascular pathophysiology. Designed as an open campus, CERIMED will allow teams working in numerous fields (physicists, doctors, radiologists, technicians, researchers etc.) to create synergies in the development of innovating tools designed to better diagnose and treat diseases. <http://cerimed.web.cern.ch>

THREE EXAMPLES OF PROJECTS THAT OBTAINED OPTITEC CERTIFICATION

The OPTITEC/POPsud Competitive Cluster is empowered by the state to certify and finance collaborative R&D projects between private enterprise and research bodies. This support represents a real source of leverage for innovation, with subsidies for HR and equipment expenses associated with the R&D project of up to 45% for SMEs, 40% for laboratories and 30% for larger corporations.

Three projects were certified by OPTITEC on 2011: SPECTROGAZ, NOPTRIX and FISHBOX.

SPECTROGAZ is working on the development of a synchronous multispectral imaging spectrometer for monitoring high-risk sites. The project carrier is BERTIN TECHNOLOGIES, in partnership with the Institut Fresnel and SILIOS TECHNOLOGIES.

NOPTRIX is developing a new spectrometric scanning technology for baggage sorting totally different to those currently used. The project carrier is BERTIN TECHNOLOGIES, in partnership with the Ecole des Mines d'Alès (engineering school), the CEA-LITEN and MULTIX.

FISHBOX, meanwhile, is putting together an automated device for the selective quantification of marine and airborne micro-organisms. The project is a response to conformity requirements related to environmental health standards. The project carrier is CHRISAR, in partnership with VEOLIA Environnement, MERMEC France, the IRD, the ENSCP and the University of Rennes 1.

These projects have received €3.6 M in subsidies out of a total budget of €8.5 M. www.popsud.org

FACTS & FIGURES

OPTICS IN PROVENCE

- Home to the ITER (International Thermonuclear Experimental Reactor) Project, of which 20% involves the optics field (lasers, measuring instruments etc.)
- A region known as the "Land of Light"
- 30% of France's photonics R&D activities
- 14,500 skilled jobs
- 5500 jobs in R&D
- 15% of turnover in R&D
- 48% of export sales
- An industrial fabric
- Manufacturing industries and engineering services cover all industrial needs

FIELDS OF EXPERTISE

- Complex optical and imaging systems
- Adaptive optics
- High-power photonics
- Optical components and micro-components
- Computer vision
- Thin layer technologies
- Medical imaging

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