LIEGE

Liège

The space sector

© ESA - CSL

The Province of Liege, Between Heaven and Earth

The Walloon Region counts in the world of space. Over several years many companies have developed highly-regarded know-how in this area which was created by especially effective activities in the traditional sector of metallurgy and mechanics. It has also developed thanks to university research. Thus for instance the Institute of Astrophysics of Liege University has played a vital pioneering role in the design and creation of space instruments. But the University has also allowed the transfer of technology to occur in a remarkable way with the creation of companies specialising in launchers, satellites, space optics, astrophysics and also digital simulation and various ground-based applications.

The core of the market is of course concentrated around ESA, the European Space Agency, and in particular the Ariane programme. We may also mention a large volume of activity undertaken for CNES, the National Centre for Space Studies, the French space agency. Stemming from the traditional activities of the space sector, the new market in space applications, which is in the process of developing new ground-based markets, is rapidly expanding. The two main examples of these emerging markets are the Galileo system (the European civil "super-GPS" system which is intended in particular for carriers and farmers) and the GMES (Global Monitoring for Environment & Security) system which aims at federalising European activities relating to observation of the Earth. In this sector some companies have gone into remote detection, global positioning and geographical information systems (GIS).

www.wallonie-espace.be

© ESA

ESA and the Ariane programme represent 80% of the turnover of Walloon companies in the space sector.

GERB © Amos

Thanks to its achievements in space optics and astrophysics, Liege University, together with some Liege companies, is one of the global references in the sector.

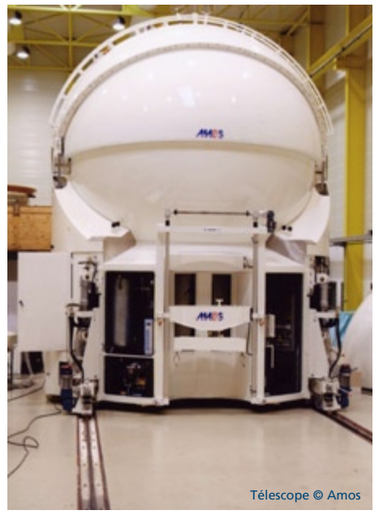
© CNES

It is rare for a satellite launch not to have an input in terms of equipment or software provided by Walloon skills.

© Ionic software

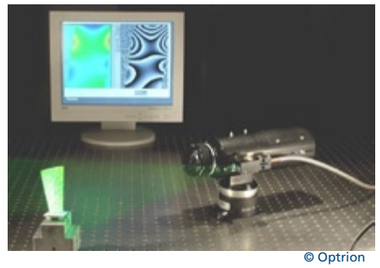
Ground-based space applications are extremely numerous and they allow good information to be obtained for correct management or for taking the right decisions.

Space as You've Never Seen it



Télescope © Amos

Astrophysical research demands the development of optical and opto-electronic equipment that is extremely precise, whether it be for applications on the ground or for on-board instruments. This is one of the flagship activities that **Amos** (Advanced Mechanical and Optical Systems) has developed from the traditional mechanical skills of the mother company Les Ateliers de la Meuse. This is the case, for instance, with ATS-1 (Auxiliary Telescope System no. 1) which forms part of the powerful VLT (Very Large Telescope) astronomical observatory that the ESO intergovernmental organisation (European Southern Observatory) is operating in Chile at an altitude of 2,600 metres. This is also the case with the Meteosat-8 meteorology satellite positioned over 35,000 km above the equator. In fact Amos provided the structure for three mirrors for the telescope of the GERB (Geostationary Earth Radiation Budget) instrument fitted on board which constantly monitors the Earth's radiation levels.


© Optrion

This skill in the space optics sector has also been developed by two spin-offs of Liege University with "terrestrial" applications :

Optrion, a young company that specialises in optical metrology. Its holographic laser technology, initially developed at the Liege Space Centre, allows the comparison of objects of different sizes before, during and after deformation and the generation of maps of changes in them with extreme accuracy.

Athol designs, manufactures and sells optical components based on holographic techniques, which are in particular demand in the sphere of observation (astronomical telescopes) and which could also be applied to car windscreens to allow, for example, GPS information to be displayed.

www.amos.be
www.optrion-tech.com

Liege in Orbit

At least three Liege companies are taking a significant part in the space adventure but in very different ways: these are Techspace Aéro, Spacebel and Gillam-FEI. Here in a few words is what these companies do.

Techspace Aéro is a member of SNECMA, the European space propulsion group, a European leader in the creation of valves for Viking, Vulcain and Vinci liquid propellants for the Ariane programme. Besides its major activity in the aeronautical sector, the company is developing and producing valves and pressure regulators for the Ariane 4 and Ariane 5 launchers in particular.

Spacebel has been contributing for almost 20 years to the success of many programmes initiated by ESA. This company based also in Toulouse in France and Ho Chi Minh in Vietnam, is developing "tailored" IT systems intended for the airspace industry for spacecraft in particular. The company is developing test and inspection benches as well as operational simulators specifically for satellites. These two types of product make up only a part of the wide range of skills and projects developed by Spacebel.

Gillam-FEI offers turnkey solutions for ultra-precise synchronisation of terrestrial and satellite telecommunications systems, with in particular the design and mass production of atomic clocks that are fitted in, among other things, GPS navigation satellites. Gillam-FEI also makes satellite TV reception systems for remote distribution networks and for multimedia applications.

www.techspace.com
www.spacebel.com
www.gillam-fei.be

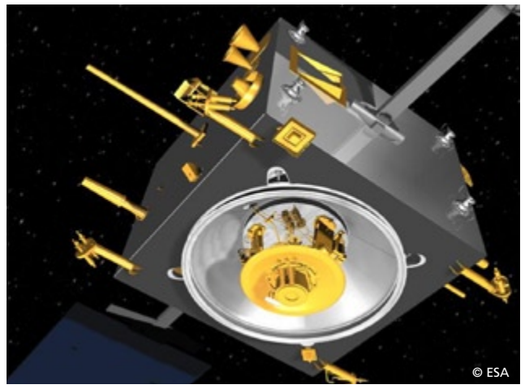
In the Walloon Region as elsewhere, the space sector and the aeronautics sector are intimately connected. There is a very strong interaction between these two spheres of activity that enrich each other both in technical and in industrial terms. So it is no accident that one finds companies that operate in both these sectors. And this complementarity is moreover exploited by the Walloon government's economic development plan. In this plan, aeronautics and space make up a single "centre of competitiveness" called Skywin that has a strategy with three directions: the future niche technologies, the diversification and creation of new companies and the introduction of more composite materials.

www.skywin.be


© Wallonie Espace

Companies that Know how to Elevate Themselves

The development of the skills and of the variety of knowledge acquired in space research has also as a side effect, allowed several Liege companies to develop extremely powerful software that allows the use of images from observation of the Earth taken by satellites in applications on the ground.
Among these, **Spacebel** which, since taking over the activities of the company DA VINCI in 1998, has extended its activities in the design of systems used in making decisions on the management of the land, the environment, natural resources etc.
The **STAR-APIC** Group has developed in a parallel niche. With its five operational centres, one each in Belgium, France, the United Kingdom, Morocco and the Czech Republic, this company has established its position as a major player in the publication of software for GIS (Geographical Information Systems) and management applications intended for managers of water and electricity distribution networks, local communities and public authorities.


© ESA

Keyobs, which also specialises in GIS and remote detection, produces maps and space analyses for impact studies in the context of infrastructure and engineering projects. Strengthened by tried and tested experience in the sphere of environmental management, Keyobs is also capable of providing cartographical solutions aimed at managing natural resources: the identification and management of polluted sites, land use, plant cover,... In addition, Keyobs is able to meet urgent needs, in particular in developing countries or in geological matters, for example with drainage basins.

© Ionic software

In the same vein, **Ionic Software** has within a few years become a global publisher of and specialist in software that allows exchange by remote detection satellites between different systems of geographical information and image broadcasting. In addition to a very comprehensive range of products, this Liege company has for instance developed tailored interoperable geo-spatial infrastructure services in the USA. This is the case in particular for NASA, NGA/ the National Geospatial-Intelligence Agency and also DigitalGlobe's "NextView." In Europe this has been mainly for Eurocontrol. Ionic Software's activities are also characterised by interfaces for the use of services intended for mobile applications, with for instance "engines" for positioning, geocoding, routing and other interfaces of this type.

www.spacebel.be
www.star-apic.com
www.keyobs.be
www.ionicsoft.com

Digital Simulation in the Service of Space


© Samtech

Whether it is for reasons of time or money, for mastering an engineering challenge, solving a thermal problem or studying a fatigue phenomenon in materials, the space industry must be able to count on modelling software that permits the a priori study of the constraints and deformations of a structure.
This is precisely the role of **Samtech** which today is a rapidly-growing large-scale European company based not only in Liege but also in France, Germany, Italy, Spain and the United Kingdom. Its spheres of activity are in space but above all in aeronautics (over 50% of its activities).
Samtech has created two subsidiaries: **GDTech** (Global Design Technology) to provide "tailored" digital engineering services and **Open Engineering** to meet multidisciplinary requirements by means of its Oofelie software suite. In the sphere of space, Samtech's activities have shown themselves to be of great value: Samcef software is being used more and more by the space industry, which has incorporated these modern methods into its design processes. In collaboration with Snecma Groupe Safran, this software has contributed to solving the problem of the structure of the Vulcain-2 rocket engine nozzle for the Super Ariane 5. It is also used by the European Space Agency and its industrial partners such as Eads and Alenia to simulate the behaviour of systems that can be inflated in conditions of weightlessness and the deployment in orbit of large telecommunications antennae. Samtech distributes its engineering software all over the world.

In a different vein, we may also mention **DELTATEC**, a high-tech electronics and IT design company. In particular it designed and manufactured the circuit boards in the PROBA satellites that gather the images generated by the optical sensors developed by CSL.

www.samcef.com
www.gdtech.net
www.open-engineering.com
www.deltatec.be

The Liege Space Centre

Originating with the Astrophysics Institute of Liege University, the **Liege Space Centre** (CSL) is one of Europe's space flagships for testing satellites and their instruments. CSL collaborates with ESA, NASA and most space industries and laboratories and not just European ones such as Astrium and Alcatel but also with American ones such as University College Berkeley and the Naval Research Lab. CSL's major activities are the following:

- Design, development and management of five FOCAL (Facility of Optical Calibration at Liege) space environment simulators for testing satellite opto-electronic systems;
- The use of vibration generators to test on-board equipment for satellites;
- Development, production and use of experiments on board European and American spacecraft;
- Research in optics, opto-electronics, interferometry, cutting-edge metrology, spectroscpy, colorimetry and radar imagery;
- Production and use of on-board telescopes for observing the sun (EIT on board the SOHO European satellite), the auroras from space (IMAGE), the universe (X-rays with the XMM-Newton observatory);
- Developing opto-electronic instruments such as spectrometers, photometers and interferometers.

www.csl.ulg.ac.be

Wallonia Space Logistics: one of Europe's Major Incubators

Wallonia Space Logistics (WSL) is the incubator of new high-tech companies. Since its foundation in 1999, about thirty SMEs have been created in particular in the space sector in the wider sense of the term. This structure also allows cross-links between managers. In terms of the quality of its operations, WSL can claim to be a pioneer in Europe. This Walloon incubator is one of the motors for the set-up of ESINET, the European network for the incubation of the space industry, which was launched in 2002 with the European Space Agency. At the end of 2005, NBIA, which coordinates American incubators, selected WSL as the first reference incubator outside the United States.

These achievements also permit the checking of projects presented to investors and the motivation of researchers and project owners in an entrepreneurial spirit.

www.wsl.be

Plots Available

The Liege Science Park accommodates research centres, training centres and high-tech companies in a green setting just a stone's throw away from the university campus. Most of the companies mentioned above are based in this specialised business park and they occupy about fifty hectares.
Expansion is under way : 10 hectares will be available in 2007 and 30 hectares in 2010.

www.liegesciencepark.be

For any further information, please contact SPI+
The Economic Development Agency for the Province of Liege
11, Rue du Vertbois
B-4000 LIEGE BELGIUM
Tél. ++32(0)4 230 11 11 • Fax ++32(0)4 230 11 20
http://www.liegeonline.com • investinliege@spi.be

With the financial support of the Walloon Region and the E.R.D.F.

With the support of GRE-Liège, Meuse-Vesdre Développement and Wallonie Espace.