Leuven, knowledge pearl

Fostering high-tech entrepreneurship in the heart of Europe

Content

Leuven, a region for innovation & high-tech entrepreneurship

Key ingredients for innovation

Leuven is situated at the heart of Belgium and Europe, only 25 kilometres from Brussels, the European capital. The city of Leuven has a long tradition of high-tech business development and plays a leading role in the European knowledge economy. It provides the key ingredients for innovation and high-tech entrepreneurship:

- cutting-edge science & technologies;
- a long tradition of technology transfer;
- an innovative business climate with many high-tech companies and state-of-the-art incubators & science parks;
- investment capital;
- people & networking opportunities;
- a network of international affiliations and partnerships.

Renowned knowledge institutes

The **KU Leuven Association**, including **University Hospitals Leuven**, is consistently ranked among Europe's top 20 academic research centres and is continually working to enhance and reinforce this position. The network of university hospitals, which together make up University Hospitals Leuven, enrich the Leuven region with one of Europe's most modern and dynamic healthcare infrastructures.

The role of the KU Leuven Association in the Leuven knowledge economy region is closely linked to the achievements of the nanoelectronics research institute **imec**. Imec performs world-leading research on nanoelectronics and has global partnerships in ICT, healthcare and energy.

Furthermore, several departments of the **Flemish Interuniversity Institute for Biotechnology** (VIB) are also located in Leuven. The KU Leuven Association, the Leuven-based VIB departments and imec have a combined R&D budget of € 664 million and employ about 20,500 people, 8,000 of whom are researchers.

Hundreds of high-tech companies

Leuven's knowledge institutes provide fertile ground for innovation and high-tech entrepreneurship. They also generate a huge inflow of state-of-the-art knowledge that brings with it a myriad of innovative ideas for new and existing companies. This favourable climate for knowledge-driven entrepreneurship and innovation makes the Leuven region an attractive location for many high-tech companies. Most of the 135 KU Leuven and imec spin-off companies are located in or around Leuven. Approximately 300 high-tech companies have set up operations in the Leuven region.

Significant investment capital

A large amount of investment capital is available to support and stimulate innovative entrepreneurship, either via venture capital groups or via university funds such as the Gemma Frisius Fund, a seed capital fund established by KU Leuven and two private equity banks. In addition, Capital-E is a venture capital fund linked to imec. The Leuven region is also home to several venture capital firms managing funds such as the Capricorn funds and the Quest for Growth fund.

A long tradition of technology transfer

KU Leuven Research & Development (LRD) was established in 1972 as one of the first technology transfer offices in Europe. Over the last 40 years, LRD has developed a tradition of collaborating with industry, securing and licensing intellectual property rights, and creating spin-off companies. LRD is dedicated to building bridges between science and industry, and to transferring knowledge and technologies to the marketplace.

State-of-the-art lab and office space

Several incubators, science parks and business centres in the Leuven region provide state-of-the-art lab and office space for innovative spin-off companies as well as international research-intensive companies. Together, they constitute a technology belt around the city of Leuven. The **Haasrode Science Park**, with a total area of 136 hectares, accommodates tens of high-technology businesses, employing approximately 5,000 people in total. The **Arenberg Science Park**, with an area of 13 hectares, was opened in 2004. This science park, situated close to imec, consists of four clusters, of which two focus on biotechnology and two on ICT and other high-tech sectors. A third science park, **Leuven Noord**, will be developed by 2017. The **Leuven Bio-incubator** offers multifunctional ventilated office and L3 lab space as well as general and technical, logistical and environment-technical support to R&D intensive biotech companies. The **KU Leuven Innovation and Incubation Centre** (I&I) provides shared facilities, equipment and services to young businesses.


LEUVEN

Highly educated employees and easily accessible

The Leuven region has a large talent pool of highly educated, multilingual and flexible employees. It is easily accessible, within close proximity to major motorways and only a 15-minute drive from Brussels International Airport. By train, it takes only 13 minutes to reach the airport thanks to a direct railway connection. The Antwerp harbour, the second largest port in Europe, is only an hour from Leuven by car. In addition, Leuven has plenty of seminar and conference facilities, and offers a broad range of hotel accommodation.

Network organisations and technology platforms

The Leuven Innovation Networking Circle, **Leuven.Inc**, stimulates high-tech entrepreneurship by bringing together like-minded people from academic research groups, high-tech start-ups, consulting agencies, venture capitalist firms, and well-established companies in the Leuven region. In addition to this horizontal network, several specialised technology platforms are in place. **DSP Valley** focuses on the design of hardware and software technology for digital signal processing systems. **LSEC** is dedicated to creating IT security awareness in the industry at large. The **Centre for Drug Design and Discovery** (CD3) aims to discover new drugs. **Neuroelectronics Research Flanders** (NERF) focuses on unravelling the neuronal circuitry of the human brain. The **Leuven Medical Technology Centre** (L-MTC) has developed expert skills in medical imaging, healthcare automation, biomaterials and tissue regeneration, biomonitoring and biocontrol. The **Leuven Materials Research Centre** (Leuven-MRC) monitors and coordinates research on materials development. The **Leuven Food Science and Food Research Centre** (LFoRCe) conducts ground-breaking research on the relationship between food and health. **PharmAbs** focuses on generating tailor-made monoclonal antibodies. The **Leuven Centre on Information and Communication Technology** (LICT) combines the expertise of electronics engineers, computer scientists and sociologists in the ICT field. In addition, the **Vlaams-Brabant Innovation Centre** aims to support innovation in SMEs.

Internationally oriented

With 154 nationalities working, studying and living in Leuven, the city has a distinctly international flavour. International schools, housing and relocation agencies, network organisations, sports clubs, hospitals and city administration all take special care to support and serve the international community of the Leuven region. As Belgium is a multi-linguistic country and is home to the staffs of the European institutions and their families, facilitating families from around the world is an embedded part of the culture. The university's 6,730 international students accentuate Leuven's diverse character.

Cross-border cooperation

A strong and dynamic triple helix cooperation between industry, knowledge institutes and government has led to a very favourable entrepreneurial climate. The city of Leuven and the province of Vlaams-Brabant collaborate closely on regional development. Together with the knowledge economy regions Eindhoven (The Netherlands) and Aachen (Germany), Leuven forms a strong cross-border network, **ELAt** (Eindhoven-Leuven-Aachen triangle). ELAt is one of the top European technological regions, promoting a knowledge economy via cross-border and interregional cooperation. Together with the biomedical clusters of Cambridge (UK) and Heidelberg (Germany), Leuven has formed the **Health Axis Europe** alliance to foster health innovation across Europe. Health Axis Europe promotes collaboration in the areas of regenerative medicine, stem cell research, medical devices and personalised medicine with a focus on research, development and education as well as on procuring financial support, particularly from within the funding structures of the European Union. Recently, Leuven joined the **Community of Ariane Cities**, which aims to strengthen the cooperation between cities and industrial organisations involved in European space transportation programmes.

Knowledge centres

KU LEUVEN · UZ LEUVEN · imec · VIB

€ 664 million R&D; 8,000 researchers

High-tech industry

300 tech companies; 135 spin-offs

Clusters

Life Sciences · Nanotechnology · Mechatronics · Cleantech

Technology platforms

LICT LEUVEN ICT · LOSEC LEADERS IN SECURITY · nerf · Leuven MTC Medical Technology Centre · PharmAbs The KU Leuven Antibody Center · LEUVEN mrc Materials Research Centre · DSP VALLEY · CDD · LFoRCe Leuven Food Science and Nutrition Research Centre

Research parks

Haasrode · Arenberg · Leuven Noord

Networks

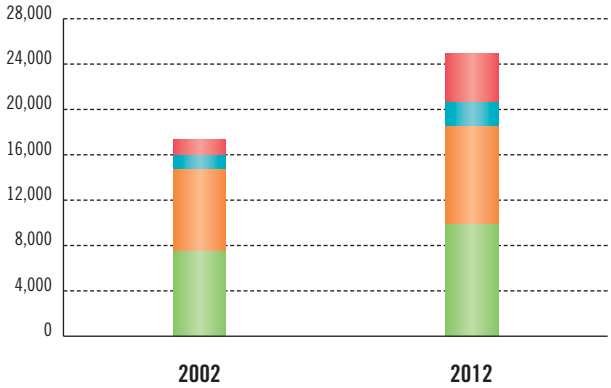
LEUVEN.INC INNOVATION NETWORKING CIRCLE

ELAt EINDHOVEN LEUVEN AACHEN TRIANGLE · HEALTH AXIS EUROPE · COMMUNAUTÉ DES VILLES ARIANE COMMUNITY OF ARIANE CITIES

Leuven, a dynamic and fast-growing region

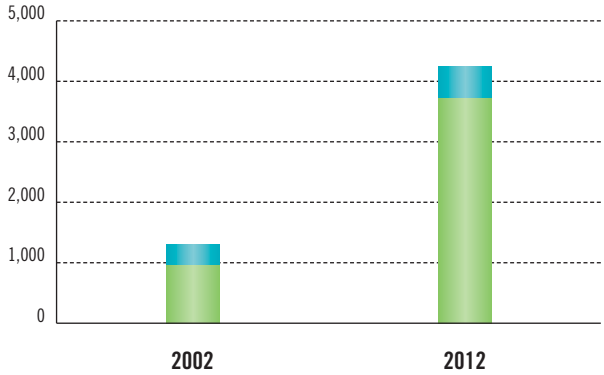
Leuven's strong focus on the creation of knowledge and technology has led to a rapid increase in innovation and high-tech entrepreneurship. Leuven is a dynamic, fast-growing region with great potential for R&D and high-tech business development. Leuven's knowledge institutes have a considerable impact on local economic growth, now as well as in the future. Leuven offers the unique combination of an international character, a track record in state-of-the-art technology innovation and access to the biggest consumer region in Europe.

Employment



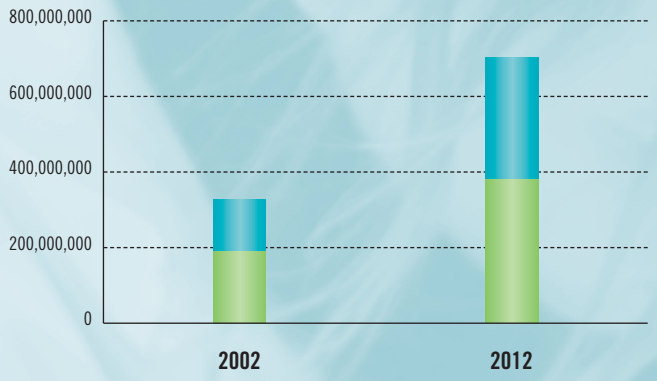
- KU Leuven
- University Hospitals Leuven
- imec
- Spin-off companies KU Leuven & imec

Employment spin-off companies



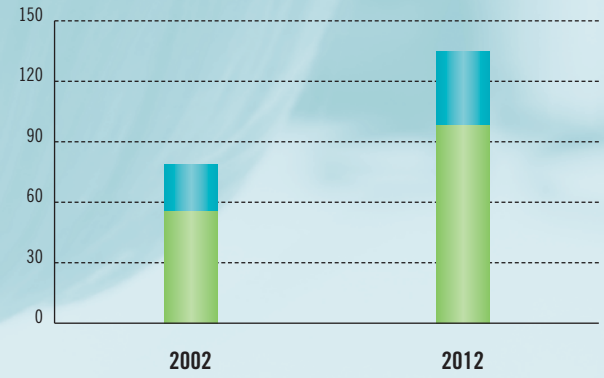
- KU Leuven
- imec

R&D budget (in euro)



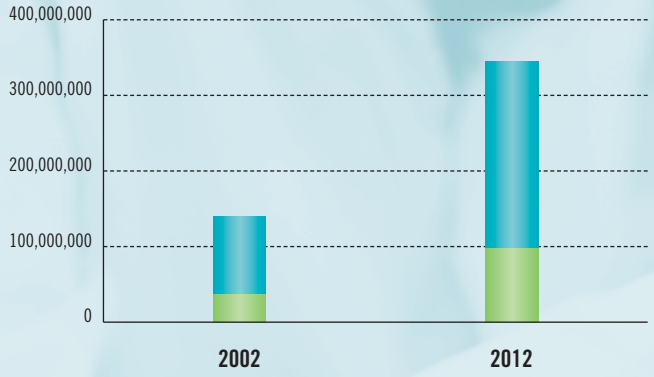
- KU Leuven
- imec

Number of spin-off companies



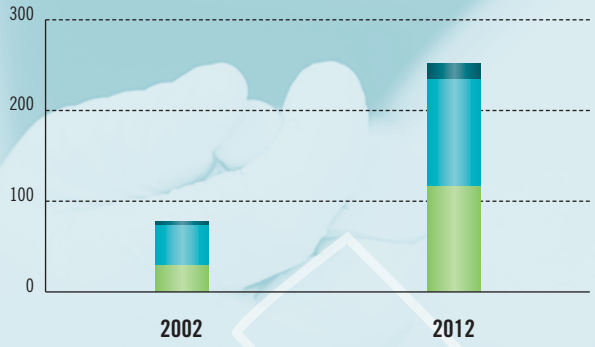
- KU Leuven
- imec

Income from research collaboration (in euro)



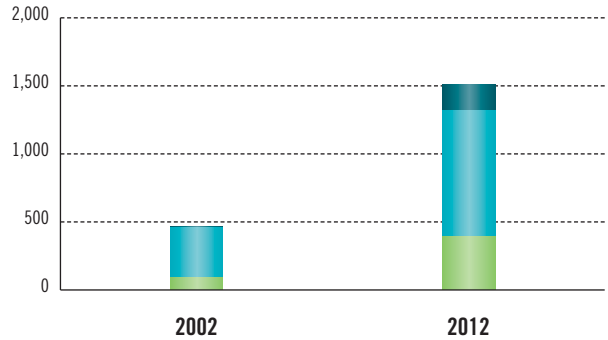
- KU Leuven
- imec

Number of patent applications



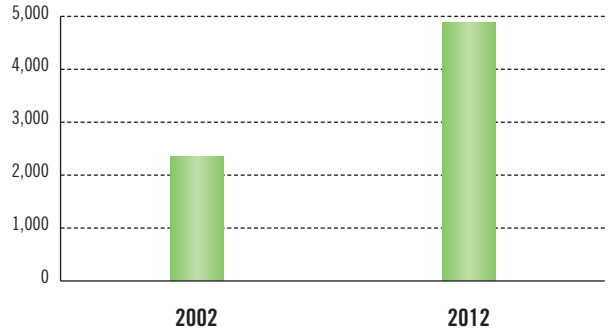
- KU Leuven
- imec
- KU Leuven & imec (joint)

Number of active patent families



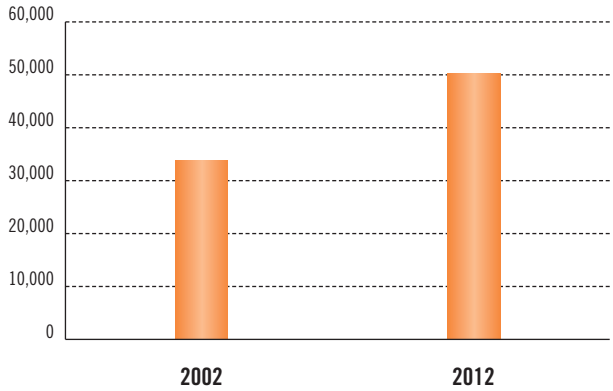
- KU Leuven
- imec
- KU Leuven & imec (joint)

Number of international publications in science journals



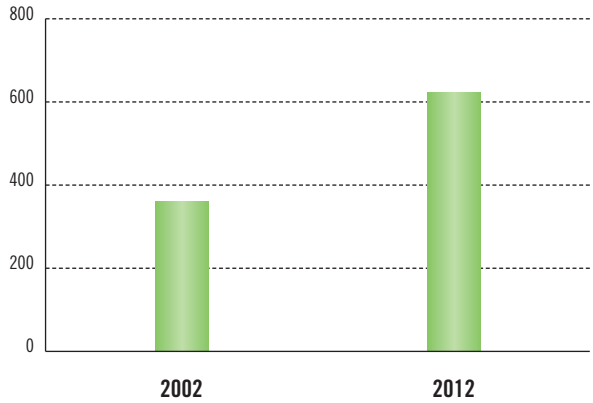
- KU Leuven

Number of students at KU Leuven and the Leuven university colleges



- KU Leuven, Groep T & KHLeuven

Number of PhD degrees at KU Leuven



- KU Leuven

Leuven, specialising in four technology domains

The three knowledge institutes, the KU Leuven Association, imec and the VIB departments guarantee a **continuous input of knowledge and innovative ideas**, providing the spark, the engine and the fuel for the technological and business development of the Leuven region. They have attracted many knowledge-intensive companies, resulting in a **high-tech ecosystem** within the Leuven knowledge region.

The most efficient way of transferring knowledge and technology between knowledge institutes and society is via **direct cooperation** within the context of research programmes. Technology that is sufficiently market-ready can be immediately transferred to an existing company, whether or not via tailored **licensing**. Another efficient way to innovate is the creation of **spin-off** companies that exploit research results and intellectual property developed within the knowledge institutes. Finally, the creation and the growth of dedicated KU Leuven Research & Development innovation platforms (e.g. CD3 in the area of drug design and discovery, Leuven-MRC in the area of materials innovation, L-MTC in the area of medical & healthcare technologies) has sparked technology transfer and created ample opportunity for close academic-industrial interaction.

Over the last few years, **four major technology domains** have emerged in the Leuven region, which has created dynamic clusters in which innovative companies and knowledge centres interact closely. These clusters are **life sciences**, **nanotechnology**, **mechatronics & smart systems**, and **cleantech**.

Life sciences

Top-ranking, modern hospitals

The University Hospitals Leuven have 2,000 beds and 8,500 employees. They are among the most modern and well-equipped hospitals in Europe and have been accredited by the Joint Commission International (JCI). The university hospitals are embedded in a Health Sciences campus where education, advanced research and medical care are brought together in one single location, facilitating a strong cross-fertilisation between research and patient care. Currently the campus is home to 1,300 researchers and 5,000 students who attend classes there.

A long-standing experience

Leuven has a long tradition in the development of revolutionary medication. In 1979 KU Leuven researchers isolated and characterised tissue plasminogen activator (tPA), a key protein involved in the breakdown of blood clots. Administered as a medication, tPA prevents heart attacks and strokes, and has saved numerous lives. Millions of patients have been treated with this medication. Tenofovir disoproxil fumarate, another revolutionary drug, was discovered in 1993 as an anti-HIV agent and is the most commonly used anti-HIV drug in the world.

Clinical excellence

Belgium has the highest number of clinical trials per capita in the world. Thanks to the availability of highly skilled research staff and excellent infrastructure, leading pharmaceutical companies come to Belgium because it is particularly suited to deliver high-quality clinical trial data. With two weeks for Phase I studies, Belgium has the fastest approval procedure within Europe. KU Leuven also plays a leading role in these clinical trials by coordinating them via the Clinical Trial Centre of the university hospitals. In addition, the Flemish universities, university hospitals, the pharmaceutical and biotech industries, together with the Flemish government have established the Centre for Medical Innovation (CMI). CMI, which is headquartered in Leuven, aims to establish an integrated biobank and promote translational research.

A unique technology transfer platform for drug development

The Centre for Drug Design and Discovery, CD3, is a unique technology transfer platform created by KU Leuven with the investment support of the European Investment Fund. CD3 aims to discover new drugs and develop them to the stage where the pharmaceutical and biotech industry are interested in either licensing the technologies developed or in undertaking collaborations with the project partners.

Potential new medicines can also form the basis for spin-off companies. Via CD3, KU Leuven has taken the initial steps in the development of new medication for various conditions, such as AIDS, Hepatitis C virus infections, cancer, arthritis, asthma, Dengue virus infections, epilepsy and Alzheimer's disease.

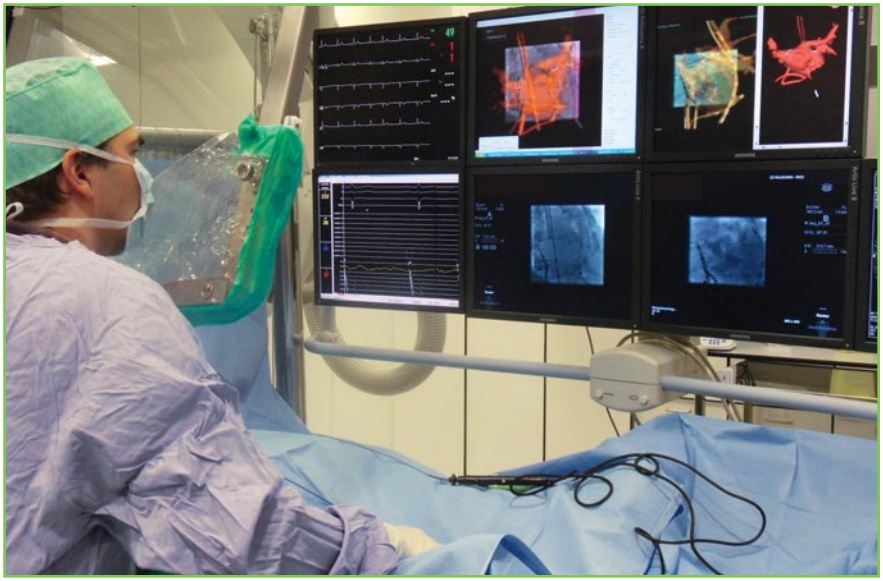
World-class international companies and spin-offs

KU Leuven's long and successful track record in biomedical R&D has led to the creation of numerous spin-off companies with global appeal, such as ThromboGenics, TiGenix and reMYND.

Highly qualified researchers

KU Leuven employs many prominent researchers who receive international acclaim. Désiré Collen and Erik De Clercq, for example, are two world-renowned and well-respected researchers who started their careers at KU Leuven. They conduct pioneering research on cardio-vascular disease and virology, respectively.

In 2012, the U.S. Food and Drug Administration (FDA) approved ThromboGenics' core product, JETREA®, for the treatment of symptomatic vitreomacular adhesion. TiGenix develops innovative local treatments for osteoarthritic or damaged joints, while reMYND is a biopharmaceutical company developing disease modifying treatments against Alzheimer's and Parkinson's disease.



Large international biomedical companies such as Terumo Europe, IDT and VWR International have also established operations in the Leuven region.

Tailor-made infrastructure

Leuven offers excellent facilities for life sciences businesses. The Leuven Bio-Incubator provides an innovative, dynamic and stimulating environment in which entrepreneurs and companies active in the field of biotechnology can develop their ideas and technologies. Its location makes it the ideal base of operations for businesses with European interests. The Leuven Bio-incubator covers 62 modules ranging from 125 to 250 m² with a total of 9,375 m² of state-of-the-art laboratory and office facilities.

Another incubator, the Biogenerator, is the main feature of the 'Feed Food Health' campus. The Feed Food Health project focuses on functional food for animals and people, health and quality of life.

Collaboration with the global industry

KU Leuven collaborates with several global players in the pharmaceutical and healthcare industries, such as UCB, Janssen Pharmaceutica, Johnson & Johnson, GSK and Pfizer. Imec works together with companies such as Pacific Biosciences, Johns Hopkins and Philips. For many years KU Leuven and imec have been providing their R&D expertise to the Australian company Cochlear, which develops cochlear implants for hearing impaired people.

Interdisciplinary research

KU Leuven encourages interdisciplinary research through horizontal structures within the university. The Leuven Medical Technology Centre (L-MTC) is a case in point. L-MTC incorporates 41 different research groups in engineering and biomedical sciences and brings together over 700 researchers and professors. L-MTC has developed expert skills in the following areas: medical imaging, bionic systems, healthcare automation, controlled release, biomaterials and tissue regeneration, biomonitoring, and biocontrol.

Advanced research on nutrition and health

LFoRCe, the Leuven Food Science and Nutrition Research Centre, was established by KU Leuven to focus on the relation between nutrition and health. It is a multidisciplinary research centre with a wide expertise in food technology, biomedical research and social sciences. The activities of LFoRCe have resulted in several collaborations with local and international companies, as well as in the creation of the spin-off company Fugeia, which focuses on digestive health. Kellogg's stimulates fundamental research at KU Leuven through the W.K. Kellogg Chair in Cereal Science and Nutrition.

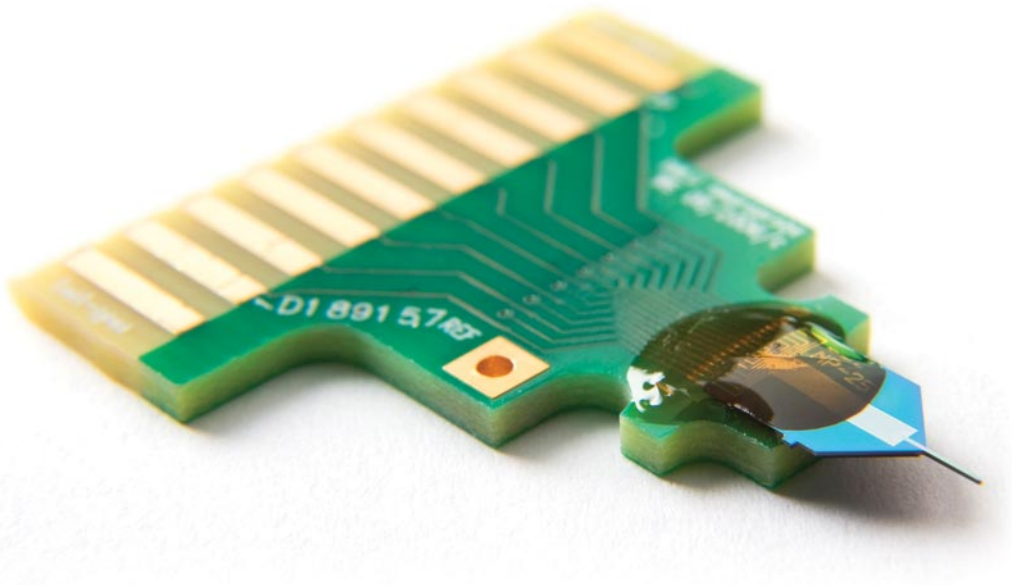
Big in bioelectronics

Imec develops solutions for future cost-effective and reliable healthcare. Imec works on platforms to advance life sciences and on wearable sensors for monitoring and diagnostics. The next-generation platforms that imec builds allow for intelligent, high-content screening and culturing of cells and biomolecules. These platforms support pharmaceutical research, but also serve as the basis for future applications for diagnosis and long-term therapy. At the heart of these systems are bio-nano interfaces, which are interfaces between biological material and electronics that allow a fine-grained two-way communication.
Imec and Holst Centre collaborate on technology for wearable and implantable body area networks. These include sensors that continuously register and interpret health parameters, and actuators that e.g. administer drugs.
Such networks have to be wirelessly connected, extremely reliable, low-power, and comfortable to wear.

Advanced research on neuroelectronics

Imec, KU Leuven and VIB, Flanders' leading life sciences institute which also has important R&D departments in Leuven, have launched a joint basic research initiative to unravel the neuronal circuitry of the human brain: Neuroelectronics Research Flanders (NERF). Supported by the Flemish government, NERF investigates fundamental neuro-scientific questions through collaborative, interdisciplinary research which combines nanoelectronics with neurobiology. This yields vital knowledge for the pharmaceutical and medical industry and is crucial for the study of pathologies such as Parkinson's disease, Alzheimer's disease or even psychiatric disorders.

NERF is located on the imec campus, where researchers work in interdisciplinary teams, thus benefitting from imec's state-of-the-art clean room infrastructure and the new 1,000 m² neurolab. In 2012, NERF has eight research teams (including three visiting teams), totalling over 40 experts from 17 nationalities.



Health Sciences campus in expansion

By investing € 800 million over a period of ten years and doubling the campus' surface, KU Leuven will expand its Gasthuisberg campus into a Health Sciences campus that brings together education, R&D and medical care in one single location. The objective behind this project is to centralise all KU Leuven life sciences departments in order to boost academic research and translational medicine. This project will allow the University Hospitals Leuven to offer the highest standard of medical care as well as maintain and strengthen their leading position on the European level.

The project will start with the construction of a new critical care department, consisting of an emergency room, a new operating room and an intensive care unit. It also involves the construction of a psychiatric hospital. The plans for a KU Leuven research building are currently being finalised. In the long term this project also includes new teaching facilities, an expansion of the oncology department, a children's psychiatry department, a day care centre, a hotel and an indoor boulevard connecting the different areas of the campus.

Today 5,000 students attend classes at the Gasthuisberg campus and 30,000 people visit the site on a daily basis. By 2015 the campus is expected to welcome 40,000 visitors daily and employ over 20,000 people.

A long-standing experience

Imec was established in 1984 in order to strengthen the microelectronics industry in the Flanders region. With a revenue of € 320 million in 2012 and over 2,050 employees, imec is a global player in nanoelectronics research. Imec's research contributes to better healthcare, smart electronics, sustainable energy, and safer transport. Besides imec, there is KU Leuven's Department of Metallurgy and Materials Engineering (MTM), which was founded in 1930, and the Department of Electrical Engineering (ESAT), which was established as early as 1900 and also makes significant contributions to the engineering research on micro- and nanoelectronics.

A unique research platform

Imec has established a unique research platform using state-of-the-art cleanroom facilities (200 and 300 mm silicon wafers, with a link between design and process technology). The platform brings together a unique consortium of companies involved in the IC (integrated circuit) processing chain, including key global players in the microelectronics industry such as Intel, Samsung, TSMC and Panasonic. It has a successful business model based on open innovation and interdisciplinary research teams. Almost the entire international semiconductor industry is clustered around imec.

Nanotechnology

A unique technology transfer platform for materials

The Strategic Initiative Materials (SIM) was founded in 2009 by ten major companies that produce and process various materials (including AGC Flat Glass, Agfa Gevaert, Arcelor-Mittal, Bekaert, Recticel, Solvay and Umicore), in collaboration with Agoria Vlaanderen, Sirris and the five Flemish universities, and with the support of the Flemish government. SIM offers a platform to finance and coordinate joint strategic research by universities and companies. SIM focuses on materials for energy and light, durable and sustainable structural materials, as well as tailored nanomaterials in their environment. KU Leuven has an important role within SIM.

World-class international companies and spin-offs

Thanks to the centres of excellence such as imec and KU Leuven many international companies, such as Philips Innovative Applications and Resonext Communications, have established operations in the Leuven region. Numerous spin-off companies have also been created based on the knowledge and technology developed. Septentrio, for example, commercialises the satellite navigation know-how developed at imec, while Target, another imec spin-off company, provides retargetable software tools for the core elements of systems-on-chip. The imec spin-off company Essensium specialises in ASIC solutions for wireless sensor networks.

Easics, a spin-off company of KU Leuven's ESAT department and imec, is a system-on-chip design company. The spin-off companies ICsense and Ansem focus on high-end chip design.

Interdisciplinary research

In the Leuven Nanoscience and Nanotechnology Research Centre (LNANO) KU Leuven brings together all its R&D activities in the field of nanoscience and nanotechnology in the form of 26 research groups. The centre has the largest number of materials and facilities for nanoscience and nanotechnology in the entire region of Flanders. The Leuven Materials Research Centre (Leuven-MRC) was created in 2005 as a collaborative interfaculty centre, functioning as an umbrella organisation for 19 materials science and technology research groups at KU Leuven. The Leuven-MRC initiative includes 61 professors and nearly 450 researchers. Leuven-MRC aims to integrate nanotechnology and materials development, and to guarantee the longevity of materials. Specific standards have been set for the development of nanocomposites and biopolymers, materials for sensors and micromanufacturing, nanostructured steel and ceramics.

Research on solar panel efficiency

Interdisciplinary cooperation between the Centre for Surface Chemistry and Catalysis and the KU Leuven Department of Molecular and Nanomaterials has resulted in the development of a material with luminescent characteristics that increases the efficiency of solar panels. This material efficiently converts the invisible (ultra)violet part of the light spectrum into visible light. Since the efficiency of solar cells is significantly lower for (ultra)-violet light than for yellow or green light, for example, this technology makes solar cells convert sunlight into energy more efficiently. Moreover, imec's silicon solar cell industrial affiliation programme (IIAP) strives to reduce silicon use sharply, while also increasing the efficiency of solar cells. This will lower the cost of solar energy substantially. With its IIAP, imec has created a research ecosystem aimed at creating innovative processes to manufacture the next generation of silicon solar cells. Researchers from energy companies, solar cell manufacturers and materials and equipment suppliers are working together with imec's solar experts to further develop these advanced processes and test them on a semi-industrial pilot line.

imec campus in expansion

In 2010, imec opened the extension of its state-of-the-art 300mm cleanroom, increasing the surface to 10,000m². The extension is 450mm-ready. Meanwhile, imec is preparing the construction of a new cleanroom that will allow imec to keep on delivering its partners topnotch research on (sub)-10nm devices, thus enabling the future growth of the global nanoelectronics industry.

Imec also extended its lab space to facilitate and advance its research on silicon and organic solar cells and on biomedical electronics. These labs account for another 1,600m², including facilities for the Neuroelectronics Research Flanders (NERF), which aims to unravel the neuronal circuitry of the human brain.

In 2014, imec researchers will move into an impressive new 16-floor office tower, which provides office space for up to 450 people and includes lab facilities.

These expansions put imec on a par with the world's foremost high-tech nanoelectronics research centres. As such, imec aims to contribute significantly to the growth of the Flemish high-tech economy.


Vanhout
Vanhout
Vanhout

A long-standing experience

KU Leuven has developed a large amount of expertise and know-how in mechatronics, the domain of mechanics, robotics and electronics. As early as 1973, the Division of Production engineering, Machine design and Automation (PMA) introduced a digital FFT analyser as one of the first European labs. The PMA Division, together with the Department of Electrical Engineering (ESAT) and the Department of Computer Science, forms the backbone of the research on mechatronics at KU Leuven.

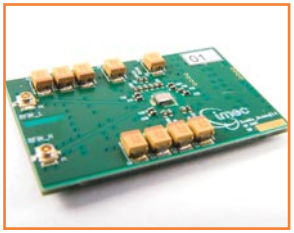
The first KU Leuven spin-off

A first PMA division spin-off was founded in 1979: Leuven Measurements and Systems (LMS International), the world leader in the field of computer aided dynamic analysis. LMS International was also the very first spin-off company of the university. In 2012, it was acquired by Siemens.

World-class international companies and spin-offs

After LMS International, many other spin-off companies in the field of mechatronics have been established in the Leuven region. Materialise has the world's largest rapid prototyping and manufacturing capacity in one single location. Materialise is market leader for 3D printing and Digital CAD software as well as a major player in medical and dental image processing and surgery simulation. LayerWise specialises in metal rapid manufacturing.

Mechatronics & smart systems



Krypton was one of the first spin-off companies in the field of mechatronics, but was later acquired by the fast-growing spin-off company Metris. Metris provides complete solutions for 3D digitising, 3D inspection and reverse engineering. In 2009 it was acquired by Nikon Metrology. Xenics, an imec spin-off company, provides a wide array of infrared imaging solutions. These companies and many others located in the Leuven region are all active in the field of mechatronics and smart systems. This mechatronics cluster accounts for half of the employment in the Leuven spin-off companies, which amounts to about 3,700 people in total.

Tailor-made infrastructure

Leuven offers ideal infrastructure for R&D intensive ICT companies. The Arenberg Science Park, which opened in 2004, covers an area of 125,000 m². It offers multi-functional office space and ultramodern lab facilities as well as support services. This science park, adjacent to the imec research campus, consists of four clusters, of which two focus on biotechnology and two on ICT and other high-tech sectors. The Arenberg Science Park houses numerous KU Leuven and imec spin-off companies. In addition, the KU Leuven Innovation & Incubation Centre (I&I) is a specialised incubator for mechatronics offering outstanding facilities for prototyping and small-scale production.

A bridge between academic research and industrial applications

Flanders' Mechatronics Technology Centre (FMTC) was founded in 2003 as a research centre for leading Flemish mechatronics companies. FMTC wants to bridge the gap between academic research in the field of mechatronics and its industrial applications. FMTC is supported by the Flemish government and collaborates closely with the KU Leuven PMA Division.

Multidisciplinary research on ICT

With the Leuven Centre for Information and Communication Technology (LICT), KU Leuven enables electronics engineers, computer scientists and sociologists to pool their expertise and experience in the field of ICT. This has resulted in a multidisciplinary research centre that aims to play a leading role in the global ICT research community. LICT brings together over 50 professors and over 350 researchers. The research centre focuses on social as well as industrial needs in an attempt to make people's lives more comfortable and more secure, improve their health and preserve energy sources as well as the environment. KU Leuven is also an active and leading participant in iMinds. iMinds is an independent research institute founded by the Flemish government to stimulate ICT innovation. iMinds is structured in five research departments and unites over 1,000 researchers from various Flemish universities and knowledge centres. Finally, LSEC (Leaders in Security) is dedicated to creating IT security awareness in the business world in general by bringing together companies with expertise in electronic security, such as Ubizen, which is now part of Verizon Business.

Heterogeneous integration technologies for innovative smart systems

Imec's smart systems research is concerned with energy-efficient wireless communication, wireless autonomous transducer systems, innovative visualisation and imager systems and organic electronics for applications such as intelligent clothing, RFID labels, rollable displays, plastic signage and lighting. Imec's smart systems research forms a unique link between its design and process technologies as many of these innovative smart systems make use of heterogeneous integration technologies. Imec refines and extends standard chip processes with new processing steps to make novel micro- and nanodevices, adding new functions to the chips other than logic and memory. Possible applications are MEMS (microelectromechanical systems) and NEMS (nanoelectromechanical systems), such as smart sensors, actuators and power scavengers, but also biochips, microimplantable appliances and solar cells.

Cleantech

World-class international companies and spin-offs

Thanks to the intensive cleantech research at KU Leuven and imec, several spin-off companies have been created with very diverse activities. Photovoltech, IPCOS, M4E, Inspyro, Triphase and EconCore are all examples of companies which have specialised in a specific cleantech domain, ranging from solar cell manufacturing, over advanced process control and rapid product development for power electronics, to the development of lightweight structures. Waterleau is one of the few global players with a complete portfolio of water, air and waste treatment, as well as energy recovery applications. With regard to anaerobic waste water treatment, Waterleau belongs to the global top three. Bluways develops integrated hybrid driving systems that provide unprecedented reductions in harmful emissions and increase fuel efficiency.

A leading position in sustainable energy R&D

Imec holds a prominent global position in photovoltaic technologies. A significant amount of research on photovoltaic cells is centralised in the KU Leuven and imec centres of excellence. Apart from solar energy, KU Leuven's research also focuses on the development of lightweight materials for wind mills.

Excellence in smart grid research

Smart grids are intelligent energy distribution networks that can avoid overproduction of energy by bringing production in line with demand. The increasing number of households that produce their own solar energy and release it into the power grid will increasingly cause production and demand to fluctuate. At the end of 2009, the European Institute of Innovation and Technology (EIT) selected the consortium of KU Leuven and VITO (Flemish Institute for Technological Research), together with TU Eindhoven and a few other leading European research institutes and companies, to further develop the 'InnoEnergy' project. This project is related to the creation of 'Energyville', a large European research centre for renewable energy, concentrating on smart grids and energy-efficient buildings and cities. In addition, imec's research on gallium nitride (GaN) based switching technologies will allow smart grids to carry much larger currents and voltages than today.

Specialised funding for cleantech companies

Capricorn Venture Partners, located in Leuven, manages venture capital funds on a pan-European level. The Capricorn Cleantech Fund invests in innovative European growth companies and this in a broad range of cleantech areas. The fund has € 112 million under management, available for investments in early to mid-stage new ventures.

Interdisciplinary research

Leuven Sustainable Earth (LSUE) is a KU Leuven research centre which seeks to develop knowledge and technology for a sustainable management of our natural resources. LSUE integrates the expertise of more than 60 professors, including environmental scientists, engineers, economists, sociologists and legal experts, who work together in 25 research groups. The common goal is to find solutions for a more sustainable future by focusing on a number of research domains, such as climate, water, biodiversity, energy and sustainable food production.

Diverse, coordinated research

KU Leuven's cleantech research is very diverse, ranging from water and air purification by using membrane technology, over biofuels and ecodesign, to additive manufacturing and the efficient production of biomass. The Leuven Materials Research Centre (Leuven-MRC) monitors and coordinates many of these different fields of research.

Expertise in sustainable manufacturing

Several KU Leuven spin-off companies develop and commercialise new manufacturing methods that use energy and materials more efficiently. For example, IPCOS offers advanced process control, Inspyro optimises metallurgical processes and M4E has developed a magnetic emulsion technology that saves up to 90% of energy compared to conventional technologies.

Specialised in sustainable structural materials

A considerable amount of research at KU Leuven focuses on sustainable structural materials, such as lightweight materials and biobased materials. This has led to the creation of EconCore, a spin-off company that develops lightweight honeycomb cores for applications in logistics, construction and packaging. The Strategic Initiative Materials (SIM), a platform that provides funding for materials research, and Leuven-MRC bring together significant expertise on sustainable structural materials.

Experience in 'cradle to cradle' technologies

Cleantech research in the Leuven region also concentrates on materials that can be reused in different products for an indefinite amount of time without any loss of quality. When such products are discarded, the materials can be recovered completely and used again for other products, within a 'cradle to cradle' model. For instance, waste materials can be used to store CO_2 and residues of incineration processes can be recycled.

Leuven, a great place to live

Leuven is a beautiful, welcoming and accessible – in short, a great – place to live. Steeped in centuries of culture and history, Leuven quickly captures your heart. It is an internationally oriented city accustomed to accommodating individuals and families from every background. It boasts an excellent education system, including international schools, and offers a high standard of medical care. It is fully linked into Belgium's motorway, railway and bus network and is only 15 kilometres from Brussels International Airport and 25 kilometres from Brussels, the capital of Europe.

With a population of 98,000 inhabitants, Leuven is a lovely medium-sized city offering a pleasant balance between work, leisure, culture and sport. Since its founding in 1425, KU Leuven has played an important role in the history of the city, which itself spans more than a thousand years.

Many historic buildings, such as the city hall, the university hall, Saint Peter's Church and the university library, bear witness to Leuven's prosperous history. The Stella Artois brewery, which was established in 1366 and has now, as AB Inbev, become a global player in brewing, has also helped shape Leuven into the flourishing city it is today.

The city's 50,000 students, spread across the university and university colleges, give the city a youthful and vibrant feel. 154 nationalities work, study and live in Leuven and give the city an unmistakably international flavour. There are plenty of bars, restaurants, sports facilities and music events to enjoy, while those searching for a little peace and quiet can go for a stroll in the parks, squares, museums or countryside in and around Leuven.

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