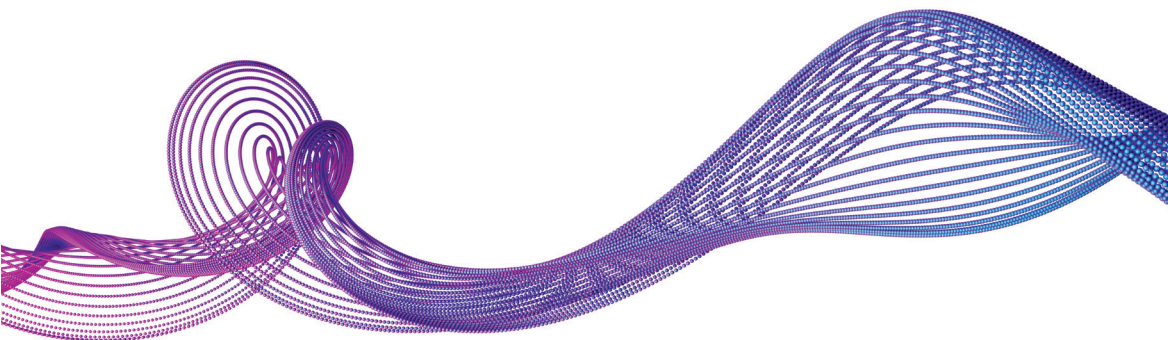


# YOUR **FUTURE** STARTS AT **IMEC**

Pursuing a **Ph.D. Degree** - Writing a **Master Thesis** - Doing an **Internship**

A decorative graphic element consisting of multiple thin, parallel lines that form a wavy, ribbon-like shape. The lines are colored in a gradient from purple on the left to blue on the right. The shape starts with a circular swirl on the left and then flows across the page, ending in a more complex, twisted wave on the right.

ASPIRE  
INVENT  
ACHIEVE



## A CHALLENGE FOR EACH TALENT

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Imec is a **multidisciplinary environment**. To accomplish our research we welcome:

- electronic engineers,
- electromechanic engineers,
- chemists, physicists,
- material scientists,
- bio engineers,
- computer scientists...

Imec also welcomes industrially oriented engineers and people with even other backgrounds to support imec's development activities and cooperate with industry, universities, polytechnic schools, associated labs, and other research institutes.

## READY TO APPLY?

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Go to [www.imec.be](http://www.imec.be) and find out more about Ph.D., internship and master thesis topics and application procedures under the “**Education**” section.

Imec offers a stimulating environment to do PhD research. The world-class facilities and available expertise guarantee an unmatched support. And if you come to imec from abroad, you will find an international atmosphere, and most likely also colleagues from your home country.

**Watch the testimonial** of 4 PhD students, by scanning the QR code.



# IMEC IN NUMBERS



More than **2,300** people work at imec, 36% of which are guest researchers and residents from the academic and industrial world.

Last year, more than

**300**



Ph.D. researchers contributed with their work to imec's long-term research.



**400** million € the total budget of imec in 2015.



**40**

is the average age of our staff.



**71**

nationalities work at imec.

**34**

awards are granted last year to imec researchers for the quality and significance of their research poster, scientific papers, or thesis.



**imec**



Imec published more than **1,000** peer-reviewed articles related to its R&D.  
161 imec patents were awarded and 133 patents were submitted.  
Imec now holds 1,123 active patent families.



**660**

European universities and research centers get training and access to advanced knowledge and tools from imec Services.

# IMEC'S RESEARCH



01

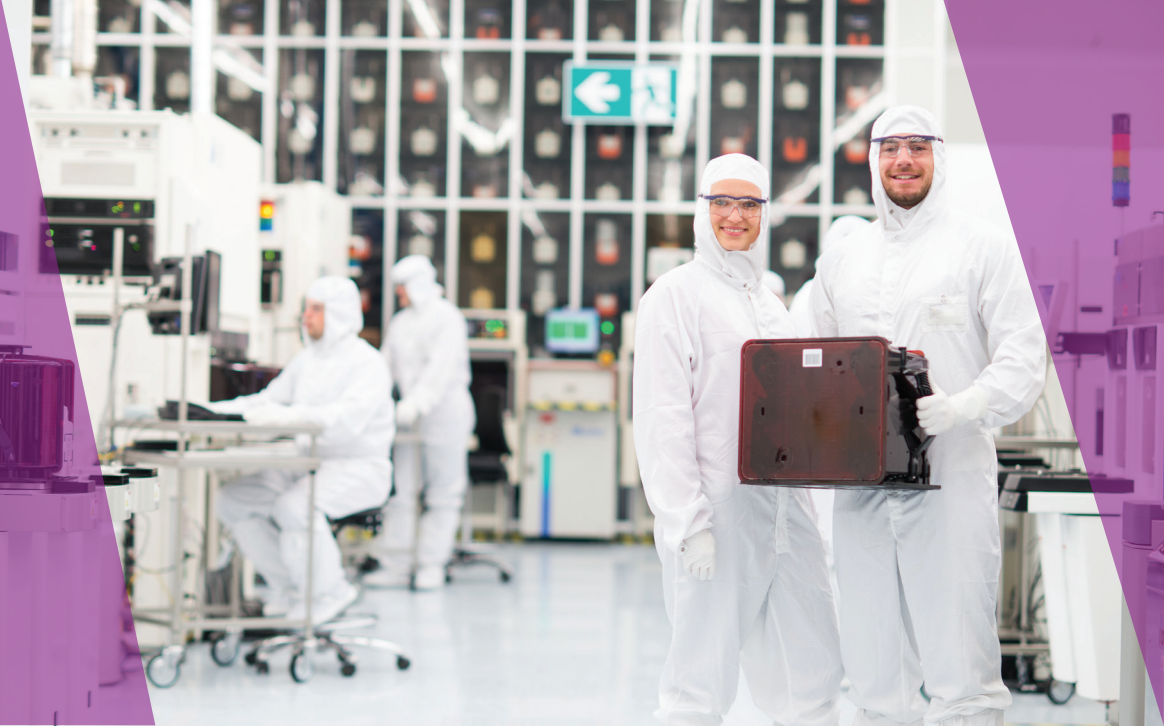
## PROCESS TECHNOLOGY & DEVICE INTEGRATION

Smart systems which interact with people and the environment, efficient healthcare, experience virtual communities as real life, ... all these fantastic applications need chips with teraflop and terabit compute and storage capabilities. Further scaling is indispensable to realize this. Imec is tackling this together with world-leading IC manufacturers, equipment and material suppliers in our state-of-the-art clean room. High on imec's research agenda are the introduction of new materials and new transistor architectures, advanced lithography, advanced memory concepts, interconnects with focus on 3D, and connected IC process technology with system design. Research builds on an extensive knowhow in characterization and modeling. Routes are explored for beyond CMOS with new devices and new computational state variables.

02

## HETEROGENEOUS MICROSYSTEMS

The CMOS processes currently used to fabricate chips promise to be the drivers of a whole new industry. They can be tuned and expanded with new processing steps to make complete miniaturized systems by adding functions other than logic and memory to the chips. Examples of this heterogeneous integration are smart sensors, MEMS (micro-electromechanical systems), power scavengers, actuators, optical chips, biochips, and even micro-implantable appliances. These smart devices will play a crucial role to make a sustainable society. Innovation and creativity will boost this industry. The know-how that is needed ranges from CMOS process technology and design technology, over packaging and interconnect technology to the nanobio domain.



03

## TECHNOLOGIES FOR EFFICIENT HEALTHCARE

To enable affordable and reliable health care, imec strongly believes in bio-electronics. We actively explore functional nanoparticles for fast molecular biosensing, magnetoresistive molecular biosensors, and on-chip magnetic manipulation and separation of cells. Imec also studies combining single cell manipulation and DNA extraction and sensing in a lab-on-chip. Next to this, imec envisages ambient, intelligent electronics in its wireless autonomous transducer solutions programme. These solutions will consist of embedded, unobtrusive devices that allow people to carry out activities in an unhampered, natural way.

04

## SUSTAINABLE ENERGY SOLUTIONS

Renewable energy, including solar, will be needed to counter the steady warming of the earth's surface. Imec's solar cell research belongs to the top in the world. It deals with the main challenge in the world to make solar cells cheaper and improve conversion efficiency. Imec also studies organic (polymer) and high-efficiency III-V-based solar cells. Imec researches power electronics and solid-state lighting based on III-Nitride materials – of which GaN (gallium-nitride) is best known. These technologies are of key importance for a more sustainable use of energy. The next generation of lighting will be LED lighting. Cheaper, large-area processing and improved light efficiency are the main drivers in research on LED technology.



## 05 **SMART SYSTEMS**

Chips make today's electronic devices smarter and smarter enabling them to communicate with and adapt to the environment and the user requirements. Imec develops smart radio systems for next-generation wireless communications. Radios will not only adapt to the communication standard, but also to the available communication frequencies and to the environment (indoor, speed, volume). With the evolution towards ambient high-resolution multimedia, radio ICs for the wireless communication of massive data streams, for example for high-definition television, also becomes indispensable. Such data streams require a massive throughput, in the order of GBits per second. Imec focuses on cost-effective, low-power 60GHz radio ICs in standard CMOS, which show a lot of potential

for the consumer market of for example wireless television screens. Next to this, enhanced vision systems which make real-life experience possible are studied. Organic semiconductors are flexible, lightweight, and cheap and thus are an important technology to create the next generation smart systems. They are especially suited for such applications as intelligent clothing, RFID labels, rollable displays, organic memory, or plastic signaling and lighting.