

4th ASCENT Newsletter – January 2017

Update on activity

The ASCENT programme was officially launched in November 2015 and we have had a very successful first year:

- 205 **researchers** have already joined the ASCENT network from 35 countries.
- 67 **technical enquires** have been received for access to data, fabrication and test and characterisation facilities at all three partner sites (imec, Leti and Tyndall).
- 27 **projects** are underway involving researchers from 16 countries.
- 14 **virtual access projects** are in progress giving access to Process Design Kits (PDKs) for imec and Leti's 14nm CMOS technology, transistor and test structure specifications and electrical characterisation data.
- 13 **transnational access projects** are in progress, or complete, providing researchers with a wide range of access including access to test wafers, electrical characterisation facilities, nanofabrication facilities for novel nanoscale devices and TEM facilities.
- 3 **Joint Research Activities** are underway that will enhance the access on offer through improved device forensic techniques, common data formats and benchmarked new materials for advanced 2-D materials.

In addition to providing access ASCENT is also committed to building a knowledge network for researchers working in nanoelectronics including the modelling, simulation and device characterisation community. To achieve this we have engaged widely with the community through a variety of ways:

- 3 Workshops and 2 mini-Workshops have been held in Belgium, Bulgaria, Ireland, Switzerland and Romania and a further two are planned for 2017.
- 23 events were attended by ASCENT partners to either host a stand or give a presentation or distribute flyers. It is estimated that over 17,000 people attended all these events.
- 86 tweets, 3 newsletters, 1 video and 1 webinar which are all accessible from the central ASCENT webpage are at the core of an extensive social media campaign.

Building on the success so far the ASCENT team is looking forward to an exciting 2017. ASCENT will continue to reach out to the wider community across Europe offering all researchers access to world-leading technologies. Through infrastructure access and knowledge sharing ASCENT will help to keep Europe at the forefront of global nanoelectronics development.

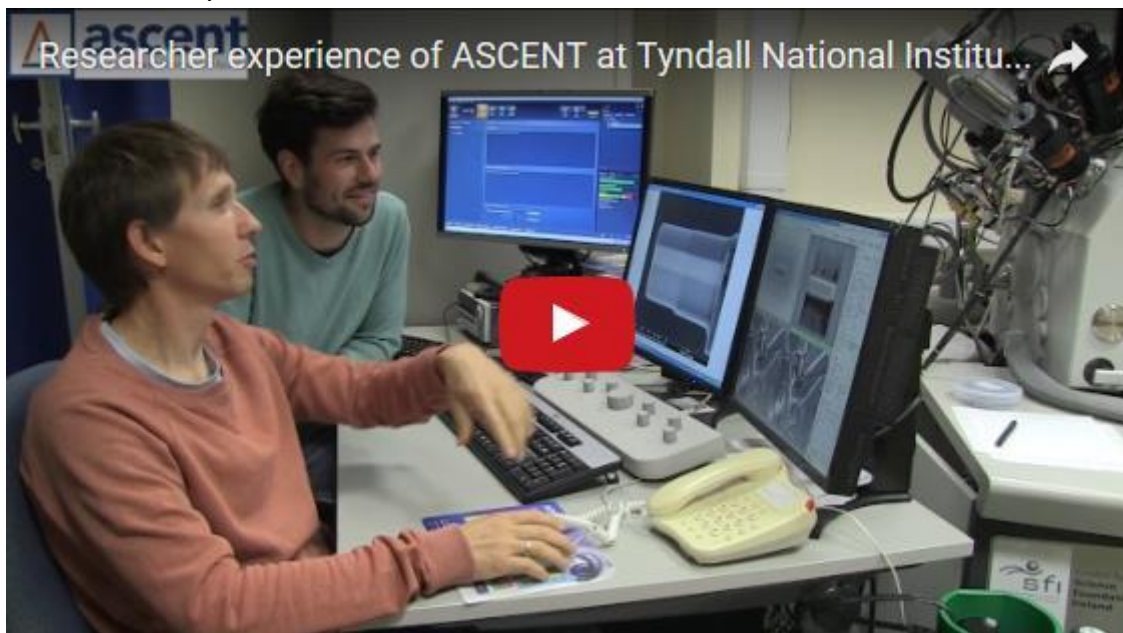
This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 654384.

Video – Peter Schüffelgen PhD student (Germany)

Peter visited Tyndall for 5 days in Q4 2016 to carry out research work in the area of physical characterisation in the Electron Microscopy Analysis Facility (EMAF), where he gained access to the expertise of Michael and Brendan on the FIB and TEM respectively. Watch this short video below ...

Peter Schüffelgen, a PhD student from Forschungszentrum Jülich, Germany submitted a proposal to ASCENT and was successful. Within his PhD he is fabricating topological insulators – superconductor hybrid junctions of various geometries. A high quality of the interface between superconductor and topological insulator is crucial. Tyndall's expertise on Focus Ion Beam and Transmission electron microscopy allowed him to actually have a look at such interfaces. In this way he could compare different superconductors and find the best material combination.

Watch Peter's story ...



<https://www.youtube.com/watch?v=f1uGQUe1RrI>

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ASCENT Introduces Themed Proposal Call – Q12017: Nanoscale Test Chips

ASCENT is launching a call for proposals targeted at researchers looking for Nanoscale Test Chips. These proposals will be given priority until Tuesday 28th February. Submission is an easy and straightforward process, see here for details ...

<http://www.ascent.network/access/how-to/>

This is a new option for researchers to engage with ASCENT. During the next 2 months ASCENT will give priority to researchers interested in access to Nanoscale Test Chips. These are available from all three partners.

Priority Call – Deadline: 28 th February 2017	
Access to Nanoscale Test Chips	
imec	14nm finFETs 28nm planar III-V finFETs
CEA-Leti	14 nm FDSOI
Tyndall	Custom Si nanowires

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Extended offering: New facilities for 2017

CEA-Leti have extended their ASCENT offering and now provide access to Physical Characterisation. Meanwhile, imec have added to their own offering, with test chips for 28nm technologies and data (virtual access) for finFETs, GAA and III-V GAA devices.

CEA-Leti have extended the facilities available through ASCENT and now offer the following Physical Characterisation systems and methods:

- Atomic Force Microscopy. *Dimension AFM Icon/Fast Scan Bruker working under glovebox (O₂, H₂O < 1 ppm)*
- High Resolution Transmission Electron Microscopy. *FEI TECNAI G2 F 20 and FEI TITAN THEMIS 80-200 kV*
- ToF-SIMS. *ION TOF ToF SIMS 5*
- Atom Probe Tomography. *CAMECA FlexTAP Atom probe*
- XRD (X-ray Diffraction). *Diffraction – Smartlab RIGAKU – 5 circles*
- XPS (X-ray Photoelectron Spectroscopy). *Spectrometer/microscope – PHI VERSA PROBE II*
- Ellipsometer. *Ultraviolet-visible ellipsometer - HORIBA JOBIN YVON UVISSEL*

imec are now offering test chips for 28nm technologies and data (virtual access) for finFETs, GAA and III-V GAA devices:

- a. 300mm wafers with Planar Metal Gate devices (28nm)
 - Silicon nFET/pFET CMOS fully integrated vehicle
 - Implanted S/D junctions
 - Replacement Metal Gate [RMG] with Local Interconnect
 - Single level BEOL metal
- b. Virtual Access. Test chip documentation (process assumptions, test structure types, ...) and data for:
 - *FinFET and Gate All Around (GAA)*
 - *III/V InGaAs GAA*
 - *PLANAR*

Success stories ...

Researchers across Europe have visited the ASCENT partners during 2016. Read about their projects and how ASCENT has assisted their area of interest ...

<http://www.ascent.network/community/success-stories/>

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