Final Press Release

Leti and Partners in PiezoMAT Project developed New Fingerprint Technology for Highly Reliable Security and ID Applications

Ultra-high Resolution Pressure Sensing Uses Matrices of Vertical Piezoelectric Nanowire to Reconstruct the Smallest Features of Human Fingerprints

GRENOBLE, France – 10th of July, 2017

CEA-Leti today announced the end of PiezoMAT (PIEZOelectric nanowire MATrices), a research project funded by the European Commission in the Seventh Framework Program (FP7, grant No. 611019, www.piezomat.eu).

From 2013 to 2017, this 44 months project and €2.9M budget, brought together 8 partners from academia, research and development centres along with small and medium enterprises as well as large enterprises from across the EU.

Consortium partners during the workshop at Eurosensors 2016 conference in Budapest

The aim of the project was to implement the proof of concept of a new technology of pressure-based fingerprint sensor based on the integration of piezo-electric ZnO nanowires grown on a silicon wafer. This technology opens the path to ultra-high resolution fingerprint sensors, able to reach resolution much higher than 1000 dpi.

The fabrication of a demonstrator embedding a silicon chip with 250 pixels, and its associated electronics for signal collection and post-processing was achieved. Although this chip does not exhibit the maximum nanowires integration density it was designed to demonstrate the concept and the major technological achievements.

Long-term developments will pursue full electronics integration for an optimal sensor resolution.

Valuable experience and know-how was gained in several areas, such as optimization of seed layers processing, localized growth of well-oriented ZnO nanowires on silicon substrates, mathematical modelling of complex charge generation, and synthesis of new polymers for encapsulation. The research and deliverables from the PiezoMAT project have been disseminated through scientific journals and conferences, and the dedicated workshop at Eurosensors 2016 conference in Budapest.

PiezoMAT gathered highly specialized academic and industrial partners:

- **CEA-Leti (Grenoble, France):** Leading European center in the field of microelectronics, microtechnology and nanotechnology R&D, Leti is one of the three institutes of the Technological Research Division at CEA, the French Atomic Energy and Alternative Energy Commission. Leti's activities span basic and applied research up to pilot industrial lines. www.leti.fr/en
- **Fraunhofer IAF (Freiburg, Germany):** Fraunhofer IAF, one of the leading research facilities worldwide in the field of III-V semiconductors, develops electronic and optical devices based on modern micro- and nanostructures. Fraunhofer IAF's technologies find applications in areas such as security, energy, communication, health, and mobility. www.iaf.fraunhofer.de/en
- **Centre for Energy Research, Hungarian Academy of Sciences (Budapest, Hungary)**: The Institute for Technical Physics and Materials Science, one of the institutes of the Research Centre, conducts interdisciplinary research on complex functional materials and nanometer-scale structures, exploration of physical, chemical, and biological principles, and their exploitation in integrated micro- and nanosystems (www.mems.hu, www.energia.mta.hu).
- **Universität Leipzig (Leipzig, Germany):** Germany's second oldest university with continuous teaching, established in 1409, hosts about 30,000 students in liberal arts, medicine and natural sciences. One of its scientific profiles is "Complex Matter", and contributions to PIEZOMAT are in the field of nanostructures and wide gap materials. www.zv.uni-leipzig.de/en/
- **Kaunas University of Technology (Kaunas, Lithuania):** One of the largest technical universities in the Baltic States, focusing its R&D activities on novel materials, smart devices, advanced measurement techniques and micro/nano-technologies. The Institute of Mechatronics specializes on multi-physics simulation and dynamic characterization of macro/micro-scale transducers with well-established expertise in the field of piezoelectric devices. http://en.ktu.lt/
- **SPECIFIC POLYMERS (Castries, France):** SME with twelve employees and an annual turnover of about 1M€, SPECIFIC POLYMERS acts as an R&D service provider and scale-up producer in the field of functional polymers with high specificity (>1000 polymers in catalogue; >500 customers; >50 countries). www.specificpolymers.fr/
- **Tyndall National Institute (Cork, Ireland):** Tyndall National Institute is one of Europe's leading research centres in Information and Communications Technology (ICT) research and development and the largest facility of its type in Ireland. The Institute employs over 460 researchers, engineers and support staff, with a full-time graduate cohort of 135 students. With a network of 200 industry partners and customers worldwide, Tyndall generates around €30M income each year, 85% from competitively won contracts nationally and internationally. Tyndall is a globally leading Institute in its four core research

areas of Photonics, Microsystems, Micro/Nanoelectronics and Theory, Modeling and Design. www.tyndall.ie/

- **OT-Morpho (Paris, France):** OT-Morpho is a world leader in digital security & identification technologies with the ambition to empower citizens and consumers alike to interact, pay, connect, commute, travel and even vote in ways that are now possible in a connected world. As our physical and digital, civil and commercial lifestyles converge, OT-Morpho stands precisely at that crossroads to leverage the best in security and identity technologies and offer customized solutions to a wide range of international clients from key industries, including Financial services, Telecom, Identity, Security and IoT. With close to €3bn in revenues and more than 14,000 employees, OT-Morpho is the result of the merger between OT (Oberthur Technologies) and Safran Identity & Security (Morpho) completed in 31 May 2017. Temporarily designated by the name "OT-Morpho", the new company will unveil its new name in September 2017. For more information, visit www.morpho.com and www.oberthur.com