

Leti and Partners in PIEZOMAT Project Target New Fingerprint Technology for Highly Reliable Security and ID Applications

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

GRENOBLE, France – Feb. 11, 2014 – CEA-Leti today announced the launch of PIEZOMAT, a research project funded by the European Commission to design and implement a new technology of fingerprint sensor that enables ultra-high resolution reconstruction of the smallest features of human fingerprints.

PIEZOMAT will focus on establishing a proof-of-concept of the technology and demonstrating its potential for large-scale market penetration.

The Leti-coordinated project includes partners from France, Germany, Ireland, Lithuania and Hungary. It aims to develop robust fingerprint sensors with resolutions beyond today's 500dpi international standards, which is the minimum resolution required by the U.S. Federal Bureau of Investigation for automated fingerprint identification purposes.



The technology relies on integrating and interconnecting a very large number of piezoelectric elements on a chip. These elements are made of vertical zinc oxide (ZnO) nanowires grown directly onto a network of interconnected electrodes manufactured via microelectronics processing.

The technology combines innovative manufacturing processes for the nanowire patterning, growth and encapsulation, along with multi-physics-model-supported design and dedicated characterization and test infrastructures. Aimed primarily at highly reliable security and ID applications, PIEZOMAT is an opportunity for academic-SME-industry collaboration, involving in particular Specific Polymers, a small company provider of polymer solutions, and Morpho, the Safran Group unit that is the market leader in security solutions and end-user of the technology.

The three-year, €2.9M project is part of the EC's Seventh Framework Program (FP7) for research and technological development.

PIEZOMAT, which refers to high-resolution fingerprint sensing using vertical PIEZOelectric nanowire MATrices, includes 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
- **The Research Centre for Natural Sciences, Hungarian Academy of Science (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.ttk.mta.hu/en
- **Universität Leipzig (Leipzig, Germany):** Germany's second oldest university, 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 actuators. <http://en.ktu.lt/>
- **SPECIFIC POLYMERS (Castries, France):** SME with nine employees and an annual turnover of about 750K€, SPECIFIC POLYMERS acts as an R&D service provider and scale-up producer in the field of functional polymers with high specificity (>600 polymers in catalogue; >250 customers; >25 countries). www.specifcopolymers.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/
- **Safran Morpho (Paris, France):** Morpho, a high-technology company of Safran, is one of the world's leading suppliers of identification, detection and e-document solutions. Morpho is specialized in personal rights and flow management applications, in particular based on biometrics, a sector in which it is the world leader, as well as secure terminals and smart cards. Morpho's integrated systems and equipment are deployed worldwide and contribute to the safety and security of transportation, data, people and countries. For more information www.morpho.com or www.safran-group.com. Follow [@MORPHO_NEWS](https://twitter.com/MORPHO_NEWS) on Twitter

About CEA-Leti

By creating innovation and transferring it to industry, Leti is the bridge between basic research and production of micro- and nanotechnologies that improve the lives of people around the world. Backed by its portfolio of 2,200 patents, Leti partners with large industrials, SMEs and startups to tailor advanced solutions that strengthen their competitive positions. It has launched more than 50 startups. Its 8,000m² of new-generation cleanroom space feature 200mm and 300mm wafer

processing of micro and nano solutions for applications ranging from space to smart devices. Leti's staff of more than 1,700 includes 200 assignees from partner companies. Leti is based in Grenoble, France, and has offices in Silicon Valley, Calif., and Tokyo. Visit www.leti.fr/en for more information.



Press contacts

CEA-Leti +33 4 38 78 02 26
Agency +33 6 64 52 81 10

pierre-damien.berger@cea.fr
aravier@mahoneylyle.com