

Nokia Research Center

- Global network of research facilities
- Global spread of research teams across thirteen locations
- Roughly 600 persons, organized in five laboratories
- Including prototyping and business development



Nokia Research Center

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Global Open Innovation Network

UNIVERSITY OF CAMBRIDGE

ETH

EPFL
ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

TAMPERE UNIVERSITY OF TECHNOLOGY

UNIVERSITY OF TAMPERE

1. Work with the best academic teams.
Be near them in order to co-create and co-invent.
2. Create a vision of the future consumer benefits, products and services. Use this vision to drive the collaboration network.
3. Build the value network for new products and technologies together with other industrial players.

A!
Aalto University



UNIVERSITY OF JYVÄSKYLÄ



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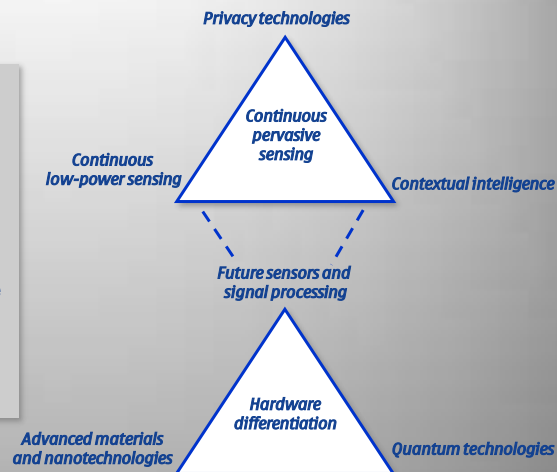
Nokia Research Center, Eurolab

Three sites:

- Cambridge, UK
- Lausanne, Switzerland
- Skolkovo, Russia

Key partnerships:

- University of Cambridge
- University of Bristol
- Ecole Polytechnique Fédérale de Lausanne (EPFL)
- Die Eidgenössische Technische Hochschule Zürich (ETHZ)
- Skolkovo Innovation City



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Case - Collaboration with University of Cambridge, UK

Strategic collaboration with the University of Cambridge, Nanoscience Centre and Electrical Division of Engineering Department, started 2007

University of Cambridge,
Nanoscience Centre

Focused first, joint 5 research in topics:

- Enhanced energy and power capacity in mobile devices
- Stretchable electronics
- Large area sensing surfaces
- Nanodevice architectures
- Synthesis and characterization of biological composite materials and systems



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Nokia Morph Concept 2007 - Thin, Compliant, Transparent, Transformable



Nokia research concept in collaboration with the University of Cambridge, Nanoscience Centre; published in MoMA New York, February 2008



reddot best of the best award 2008

UK Trade and Investment Nordic Innovation Award 2010

FinNano Award 2010

Over 5 million views in YouTube

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Nanotechnologies for Future Mobile Devices



"Nanotechnologies for Future Mobile Devices, the product of an unusual and productive collaboration, offers an interesting vision of our growing interconnectedness and the technologies that are likely to change this in the future",
Marc Lavine, In Science, 17 September 2010



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University Collaboration



Team outings



Formal and informal dinners

Working hand in hand, and networking with students and researchers



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Nokia Research Center nanotechnology laboratories



Atomic layer deposition



Electrochemistry



Quantum photonics



Atomic force microscope (Impedance and electrochemical measurements)



Precision electrical measurements set-up in an electrically shielded environment



Surface material testing lab

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Nokia Research Center – Skolkovo

1. Future Manufacturing Technologies

Printed Electronics

- touch sensitive surfaces, active (transistor) circuits

Thin Film Energy

- Batteries (hierarchical nanostructures) and supercapacitors with nano-enhanced inks (graphene - nanocarbons)
- Energy harvesting (photovoltaics nano-enhancements of DSSCs)

Thin film sensor technologies

- Autonomous sensors, chemical and biochemical sensors

... and manufacturing paradigm is changing



Example of VTT Roll-to-Roll processes
Lecour, S, Wagner, Z, Huang, and Z. Suo, Stretchable gold conductors on elastomeric substrates, APL 82, 2404, 2003.

2. Sensor technologies

Low level sensor software

- Embedded software development, Control systems for sensor platforms

Sensor processor algorithms

- New algorithm development, algorithms for power efficient analysis

Mobile sensor content data mining

- Behaviour classification, recommendation systems

Wellness Diary (Activity monitoring application)



Sports Tracker (GPS based community service)



3. Health care

Mobile health care sensing

- New sensing solutions for health and wellness

Wellness and fitness

- Tools to support a healthy lifestyle

Mobile Health care

- Mobile solutions for chronic disease, sensing to support Public Health

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Radios and Communication

Cognitive radio and sensor networks



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