

# Antennas and Propagation Research activities

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**iMinds**

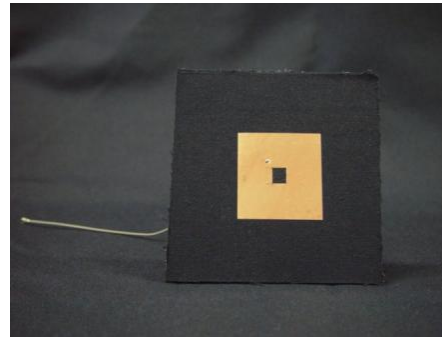


- **Numerical Electromagnetics**
  - Hybrid techniques
    - ◆ Collaboration with Agilent Technologies
- **Active flexible/stretchable antennas**
  - focus on textile/wearable antenna systems
    - ◆ FP7 ARMOURS project
- **Body-centric communication**
  - MIMO techniques in a body-centric context
- **Electromagnetic Compatibility**
  - including signal/power integrity and RF exposure

- **Robust** antenna design on **standard materials** readily available in application



*Fleece*



*Aramid*



*Protective  
foam*



*Dashboard  
foams*



*Implantable  
antenna*



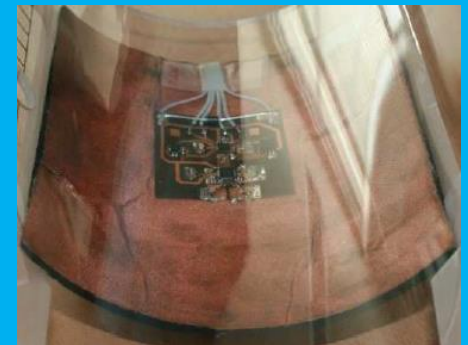
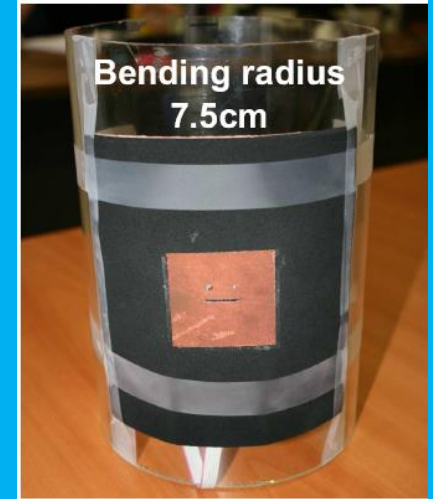
Project FP6-2004-IST-4-026987



... for communication



... for localisation

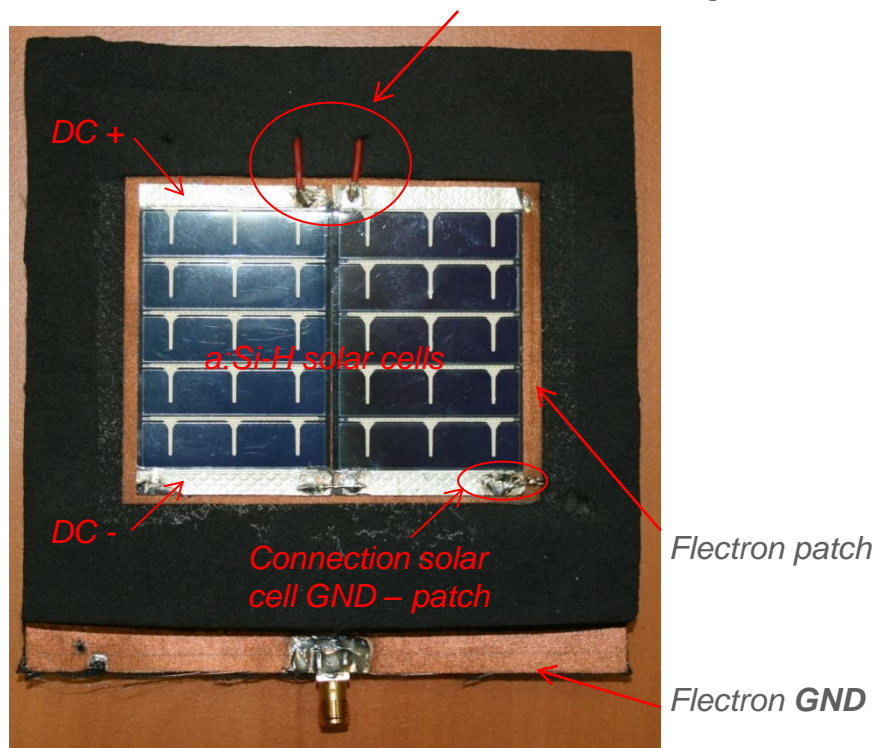


... for sensing

## ■ Autonomous textile antenna modules

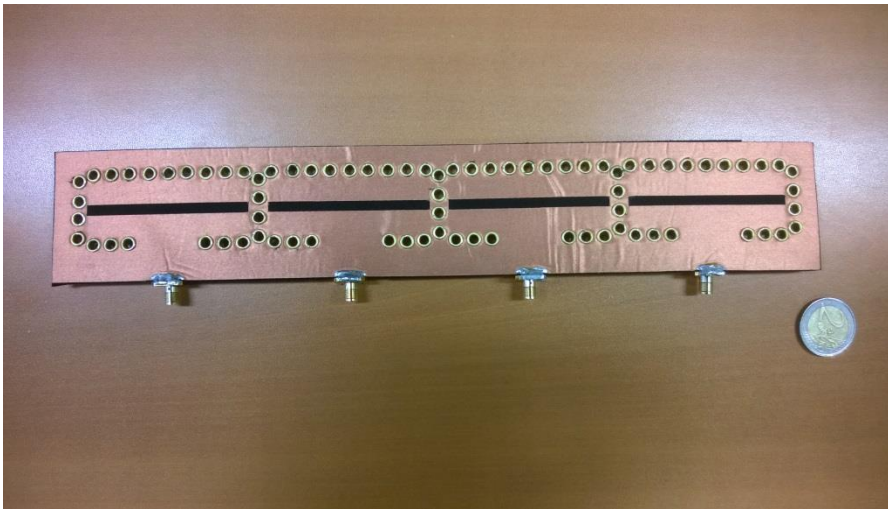
- 900 MHz ISM band antennas

*Wires connecting solar cells with power management module*

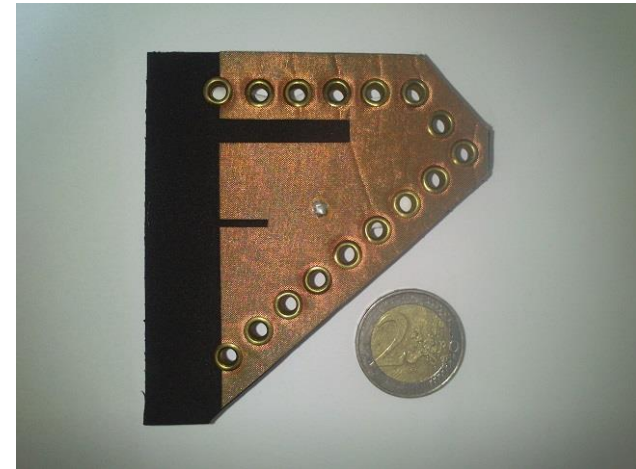


*Direct integration of solar cells on antenna without affecting performance*

- **Substrate Integrated waveguide technology**
  - Technology enables miniaturization



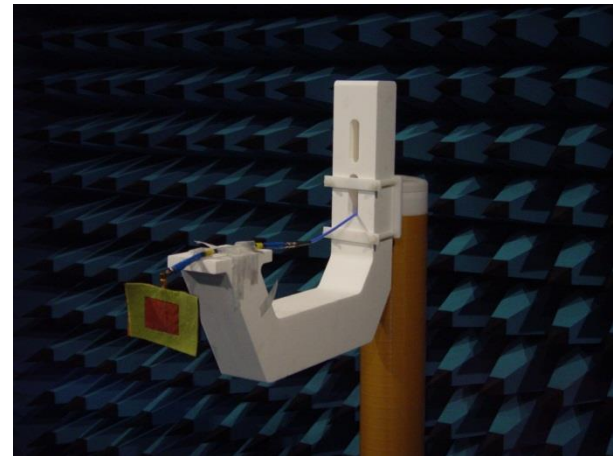
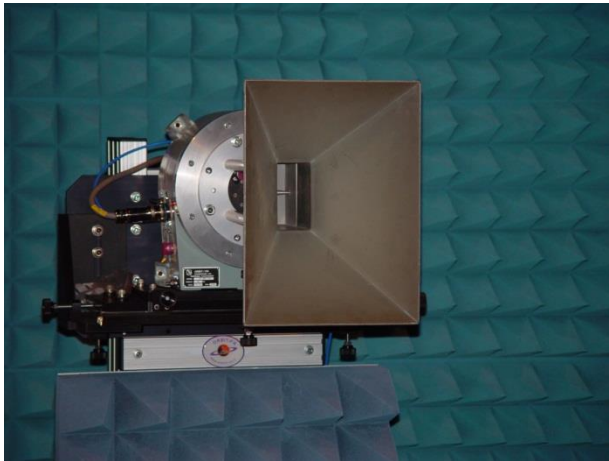
***Four-element textile antenna array***



***Dualband WiFi textile antenna***

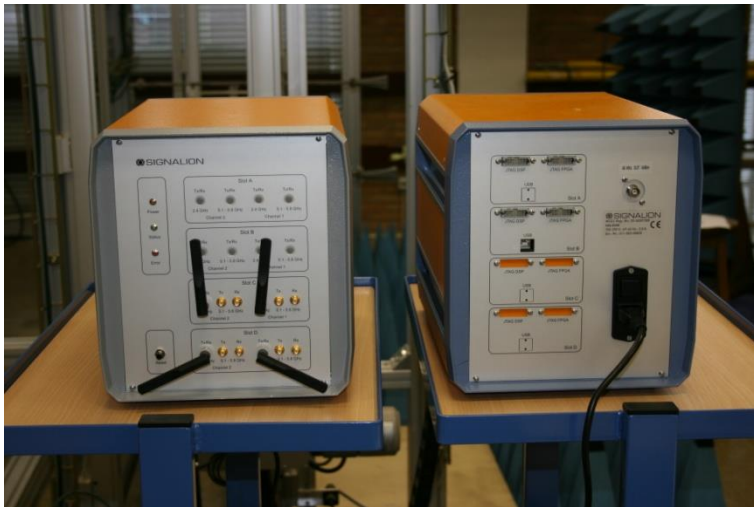
## ■ *Antenna Measurement Chamber*

- *N5242A PNA-X 4-port Network Analyzer*
- *Fully automatic positioning system for 2D antenna patterns*



## ■ Software defined radio testbeds

- *Signalion HaLo 420 4x4 MIMO testbed*
  - ◆ *2.45 GHz ISM and 5-6 GHz band*
- *HaLo 430 4x4 phase-coherent MIMO testbed*
  - ◆ *2.45 GHz ISM band*





## ■ **Software defined radio testbeds**

- *National Instruments SDR testbed*
  - ◆ **Currently: 12 ETTUS N210 modules**
    - ↻ *SISO/MIMO communication*
  - ◆ **Upcoming: 20 ETTUS/RIO modules with programmable FPGA**
    - ↻ *Cooperative communication*



- *UWB testbed (25 modules)*
  - ◆ *Localization and communication*

