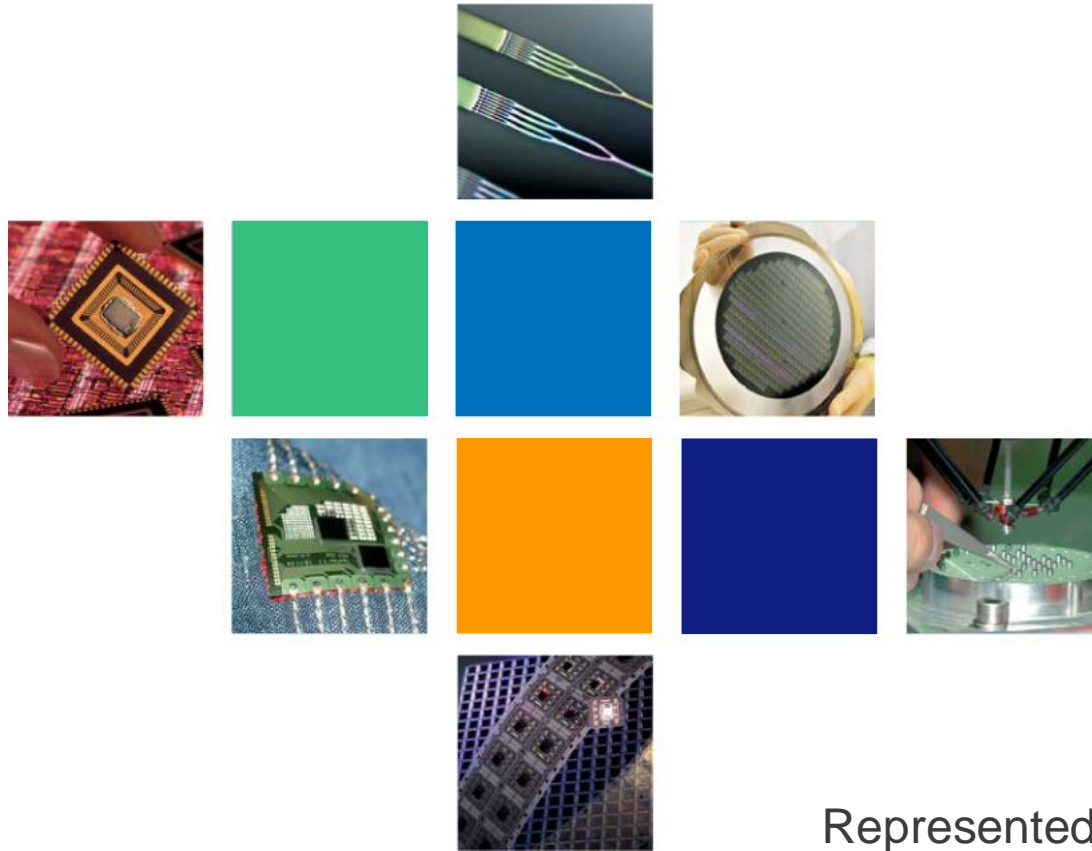


Heterogeneous Technology Alliance



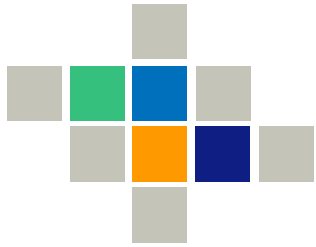
Represented by **4  LABS**

csem

cea
leti
liten

VTT

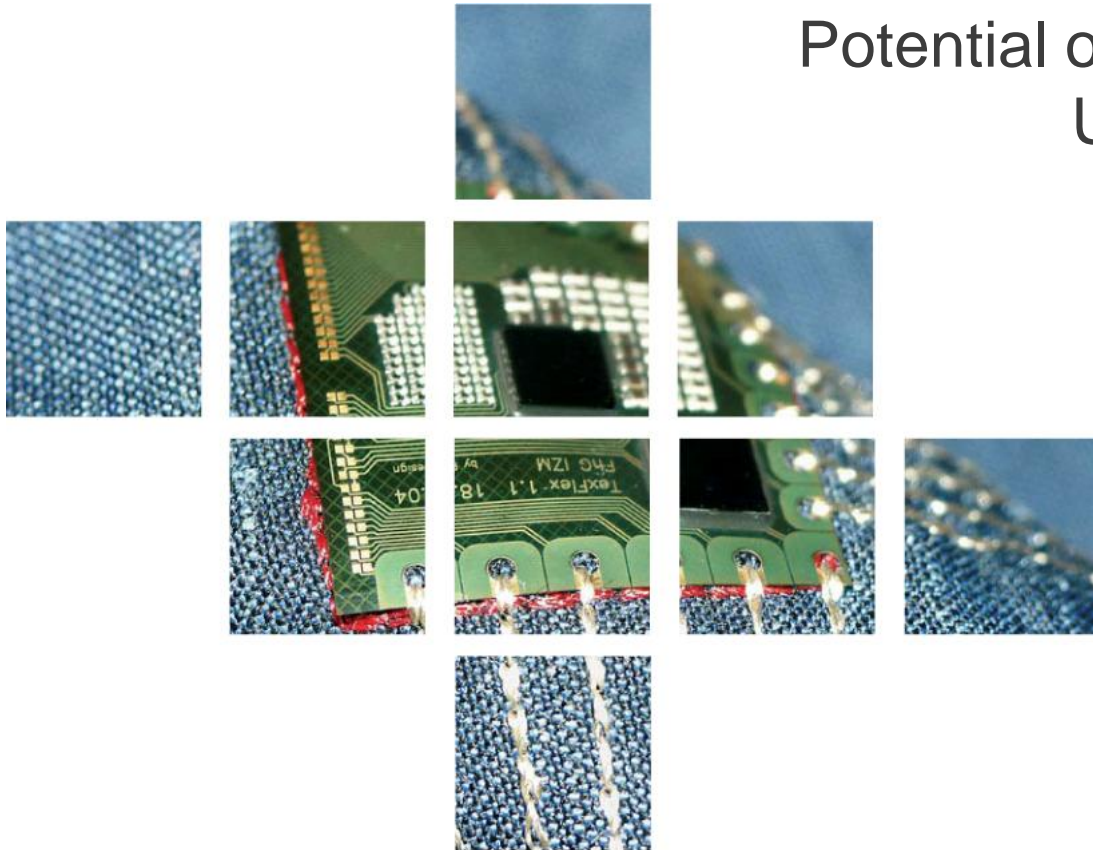
Fraunhofer
**Verbund
Mikroelektronik**

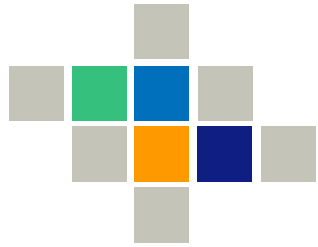


Heterogeneous Technology Alliance

Potential offer for CERN and for the Upgrade of LHC

Dr. André Perret
CEO 4-Labs S.A





Heterogeneous Technology Alliance

Outline

- Manufacturing facilities
 - Silicon detectors
 - Other materials
- ASIC's
- MEMS-MOEMS
- Assembly
- Characterization and Test
- Subsystems

- Contacts

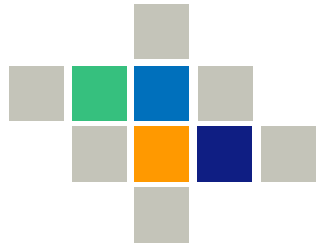


Heterogeneous Technology Alliance

Manufacturing Facilities

- 800 M€ investments, env. 200 technicians and 5000 engineers around
 - The silicon wafer 200-300 mm line from LETI
 - The wafer/packaging lines (from 100 to 300mm) from FhG
 - The silicon wafer 150 mm line from VTT
 - The microsystem facilities from CSEM
 - The polymer platform from LETI, LITEN, FhG-V μ E and CSEM





Heterogeneous Technology Alliance

Manufacturing facilities

- Standard strip or pixel detectors on 150mm wafers
- Strip or pixel detectors on 200mm wafers (material should be available in 2010)
- Assembly of readout chips on detectors, mounting and packaging
- Strip, pixel detectors on new materials (SiC)
- 3D detectors on 150 mm wafers

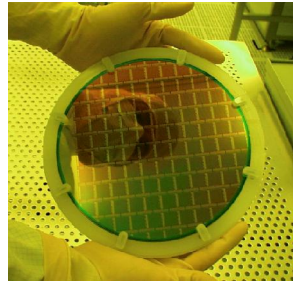
- Double-sided detectors on 150-200 mm wafers



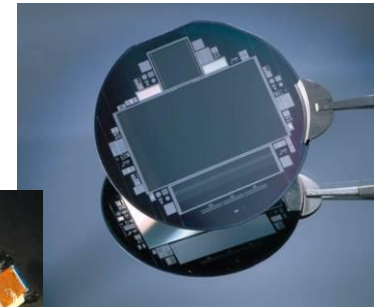
Detectors



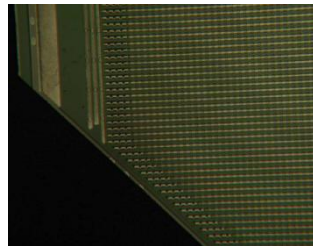
Wire chambers



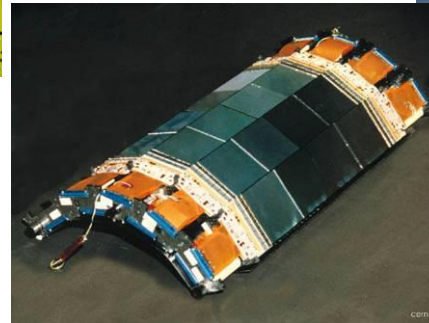
Pixel detectors



Double-sided detectors



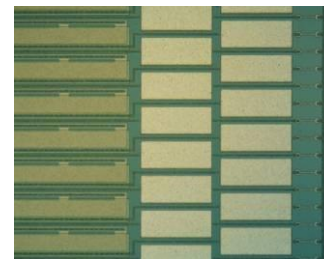
3-D Detectors



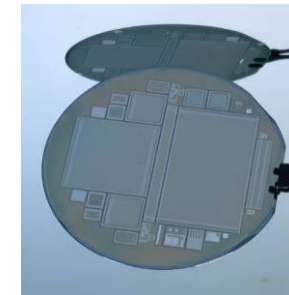
Other materials:
Glass, Quartz, III-V,
Diamond,...



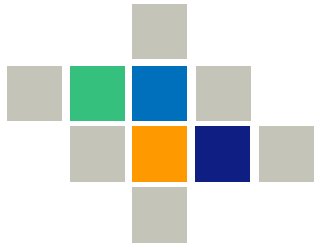
Poly-CdTe for
beam monitoring



Capacitor chip
on quartz



CZT gamma camera



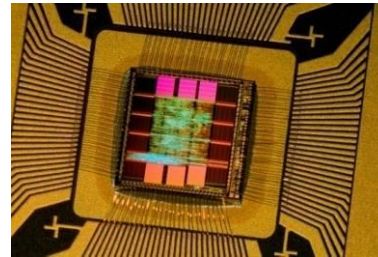
Heterogeneous Technology Alliance

ASIC's

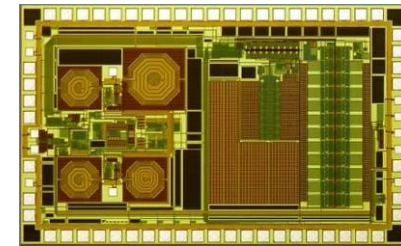
- ASIC service : analog/digital/RF , SoCs
 - ASIC design, prototyping, industrialization, testing, and production



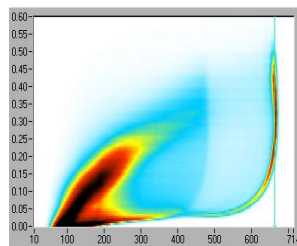
Imager & ASIC co-design



Microprocessor



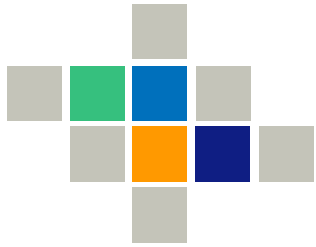
RF sender/receiver



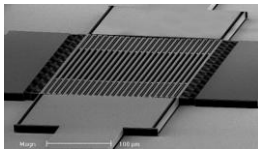
Signal processing



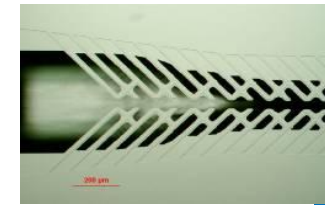
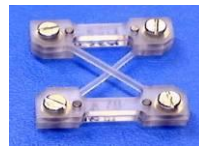
- Above IC CMOS imager
- high Quantum efficiency
 - on-chip image processing
 - 300mm compatible



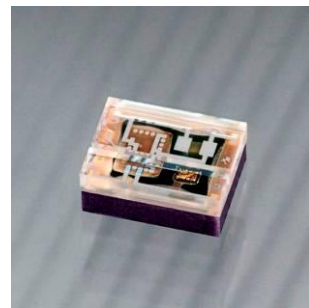
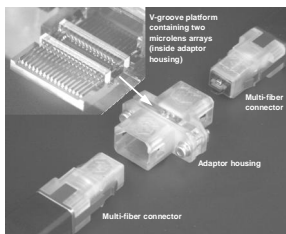
- MEMS design-development-manufacturing
 - Sensors (pressure, acceleration, position,)
 - Mechanical devices
 - Optoelectronic devices



Ajustable grating



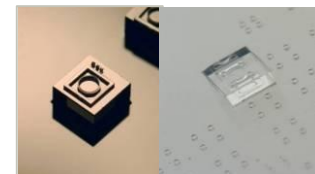
Fiber clamping



Low cost 10GB transmitter



Multi-channel transceiver

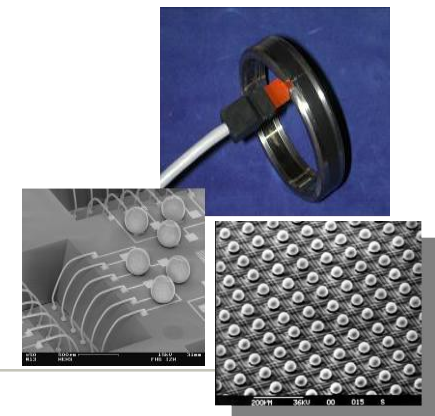
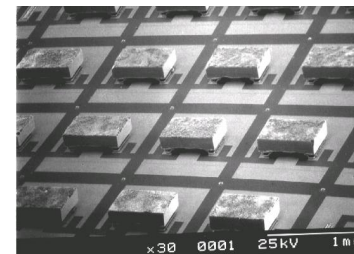
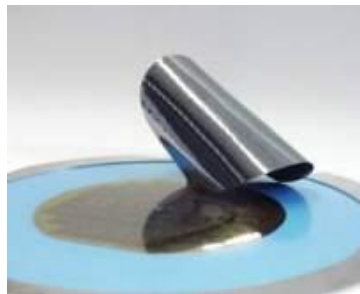
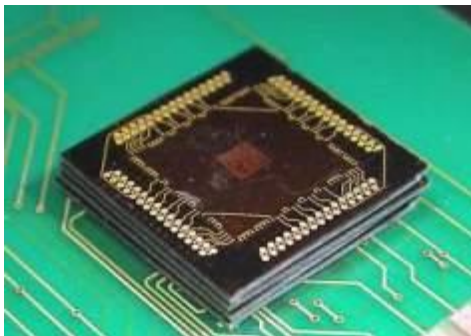
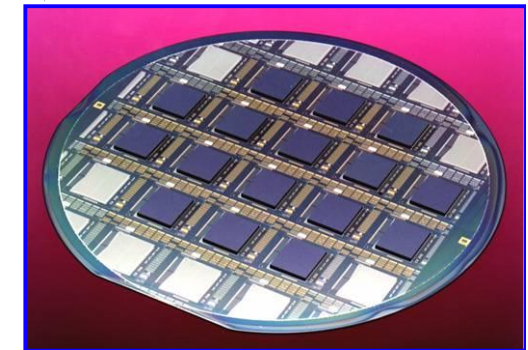
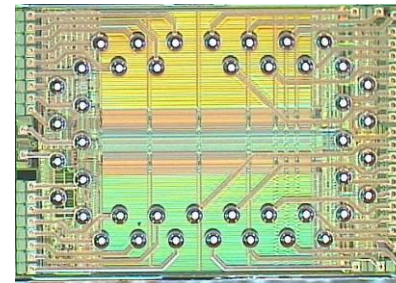
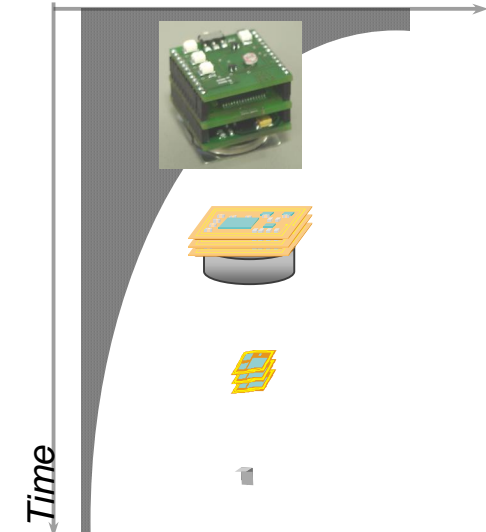
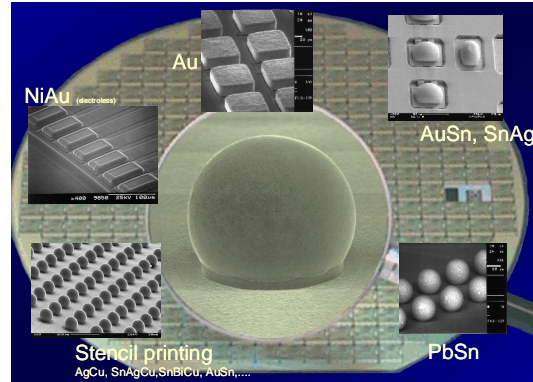


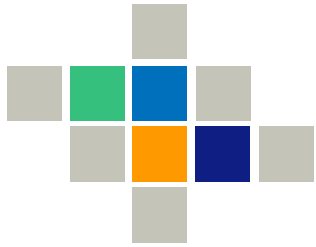
Lego-type optical device



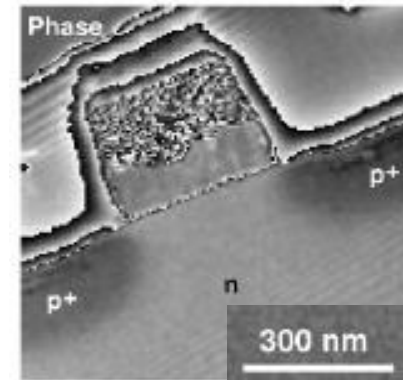
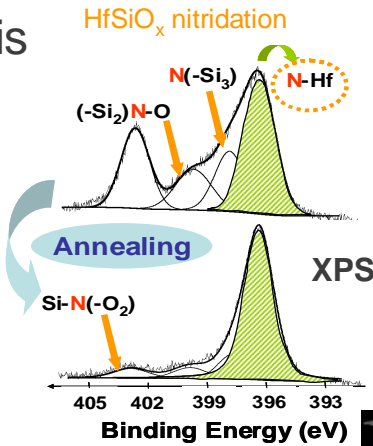
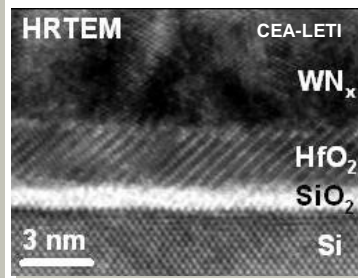
Heterogeneous Technology Alliance
Assembly

- Flip-chip
- Wafer level
- Chip in polymer
- Flexible systems
- Electro-optical packaging
- MEMS packaging
-





- Physical & Chemical Analysis



Electrostatic potential mapping by electron holography

- Simulation, Modeling & Electrical Test

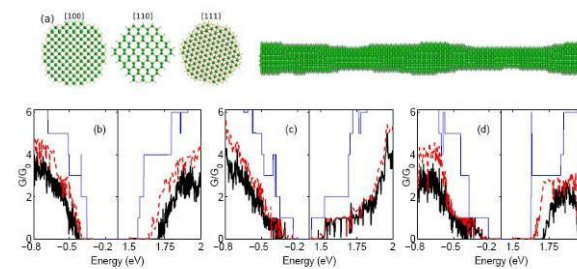
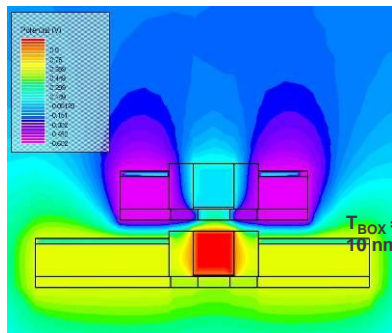
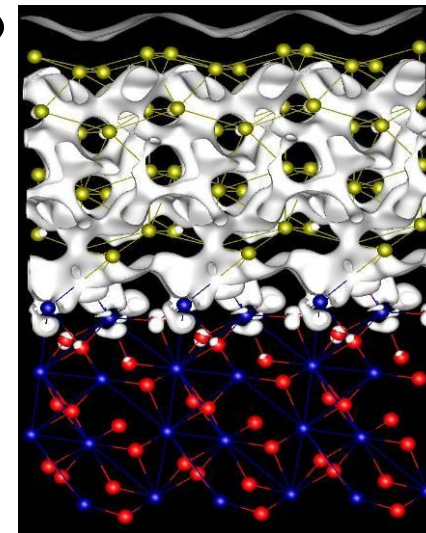


FIG. 3: (a) Cross-section for [100], [110] and [111] oriented nanowires and an example of a SiNW profile used for the Lan Buttiker modelling. (b-d) Conductance through SiNWs with surface roughness, calculated for NWs oriented along the



Electronic density in vacuum

Charge transfer due to evanescent metallic wavefunctions in the oxide

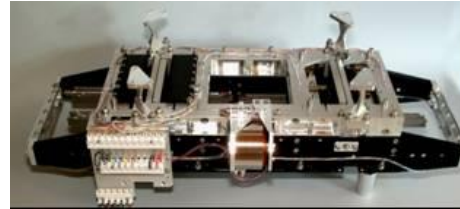
Oxide surface in vacuum

isodensity at the Fermi level



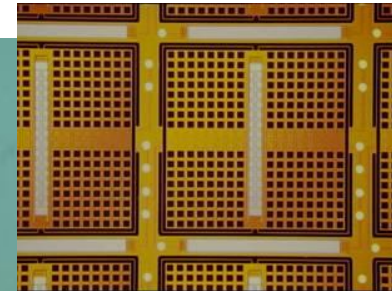
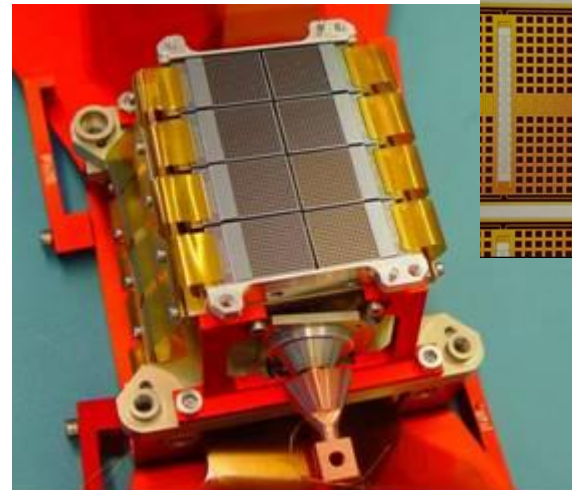
Heterogeneous Technology Alliance
Subsystems

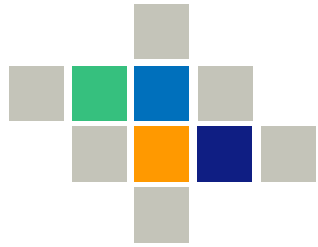
- Electromechanical devices



- Optical systems

Far infrared system for
European Space Agency
telescope *Herschel*





Heterogeneous Technology Alliance

Contacts

4 LABS

Dr. André Perret

4-Labs

18 , Chemin des Aulx
CH-1228 Plan-les Ouates
Suisse

Phone: +41(0)32/720-5347
andre.perret@ 4-labs.com
www.4-labs.com

Dr. David Holden

4-Labs

18 , Chemin des Aulx
CH-1228 Plan-les Ouates
Suisse

Phone: +33(0)438/782249
david.holden@4-labs.com
www.4-labs.com