



Fondazione Bruno Kessler

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7 | RESEARCH
CENTRES

+400 | RESEARCHERS

+100 | INTERNATIONAL
PHD STUDENTS

FBK Mission



Future built on knowledge

Our mission is excellence of science which extend our innovation capability and involve the community and the economy in the circulation of knowledge and technologies (**impact**).



FUTURE BUILT
ON KNOWLEDGE

Center for Materials & Microsystems

Director | Gianluigi Casse



Research Units & Labs

- **MST** | Micro System Technology
- **FMPS** | Functional Materials and Photonics Structures
- **IRIS** | Integrated Radiation & Image Sensors
- **ARES** | Applied Research on Energy Systems
- **MNF** | Micro Nano Facility
- **LaBSSAH** | Bio-Nano Science and Technologies for Health

FBK Vision on THz Technologies

Situation:

- Leading edge THz technologies in Europe
- Fragmented know-how landscape

**Need a BROAD, COOPERATIVE, and STRONG
initiative on THz!**

FBK *vision*:

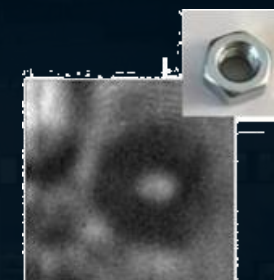
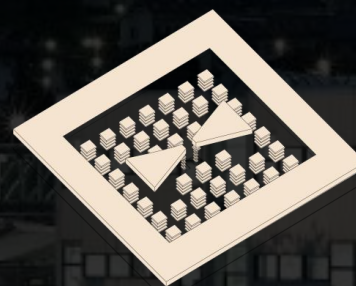
- THz technologies as healing force for *materials and semiconductor* industry
- THz applications will be *high-valued*, with relevant impact



FBK Contribution

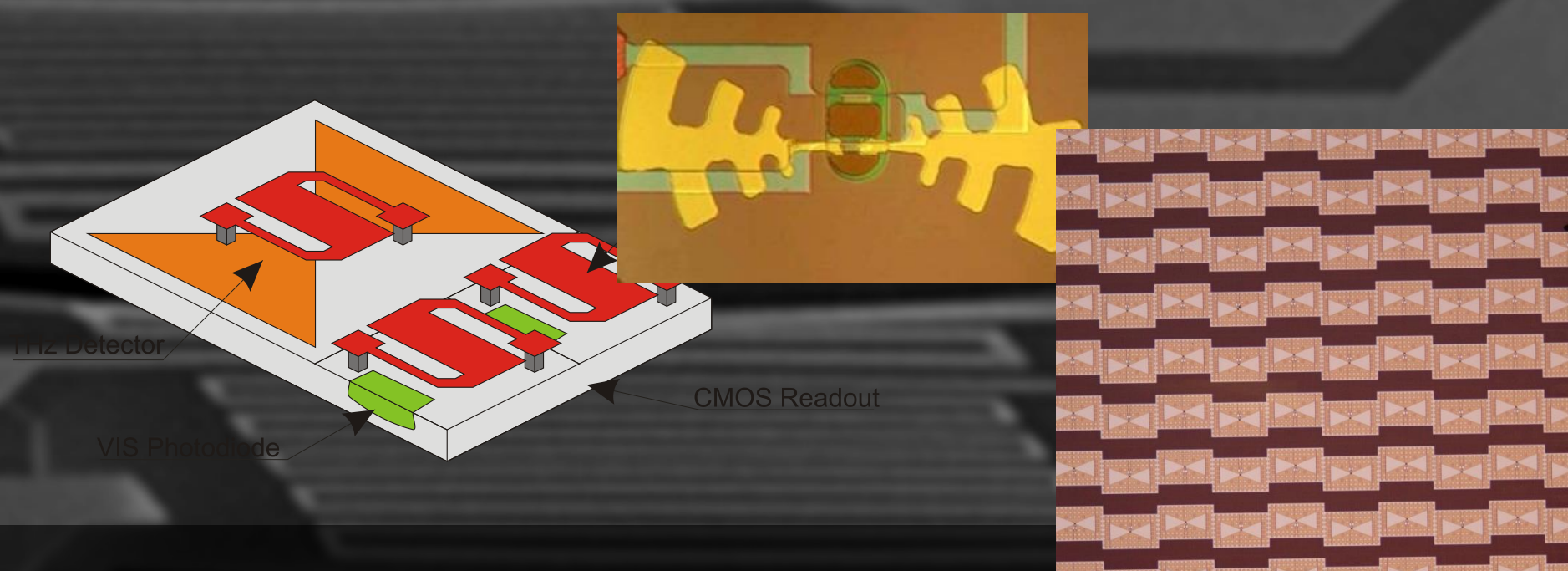
Focus on Research & Innovation Areas:

- **Manufacturing and Robotics**
- **Security**
- **Health**
- **Food and Agriculture**
- **Open Science Track**



Materials | Sensing | Imaging

THz | Experience and Projects



- **IMATERA (Euripides):** Bolometric Sensor and Readout (2007-2010)
- **Mutivis (EU FP7):** Monolithic CMOS VIS-IR-THz imager (2008-2012)
- **NaoMi (Local project):** Bolometric detector with ROIC (2008-2013)
- **Graphene FlagShip:** GFET THz detector on CMOS (2016-ongoing)
- **Internal research:** CMOS Multispectral FET Imaging (ongoing)

THz | FBK Units, Facilities & Labs

Integrated Radiation and Image Sensors (IRIS)

- CMOS Integrated circuits and imagers
- Electro-optical systems

Functional Materials and Photonics Structures (FMPS)

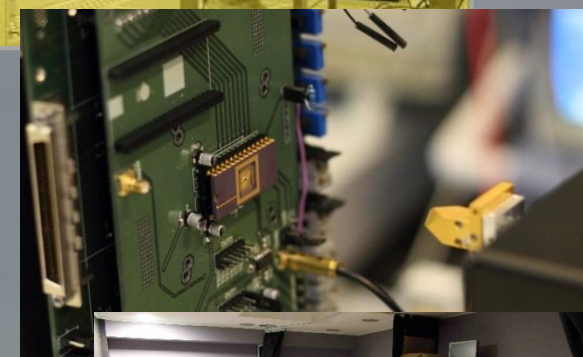
- Integrated optical circuits
- Nanostructured materials

THz Characterization Lab

- Tunable CW THz source (265-350GHz, 750-1100GHz)
- Reference detectors, optical elements, lock-in amp

Micro-Nano Facility (MNF)

- Clean Room Detectors 500m² Class 10/100
- Clean Room MEMS 200m² Class 100/1000



FBK & THz | Wrap-up

FBK Vision on THz

High-level knowledge in Europe, next level:

- Promote cross-contamination, support to TERAFLAG!
- New life to material and semiconductor industry

FBK Experience

Detectors (FET-based) and Imaging
Characterization and Systems

FBK Contribution

Materials – Sensors – Imaging
Research Units, Labs and Facilities