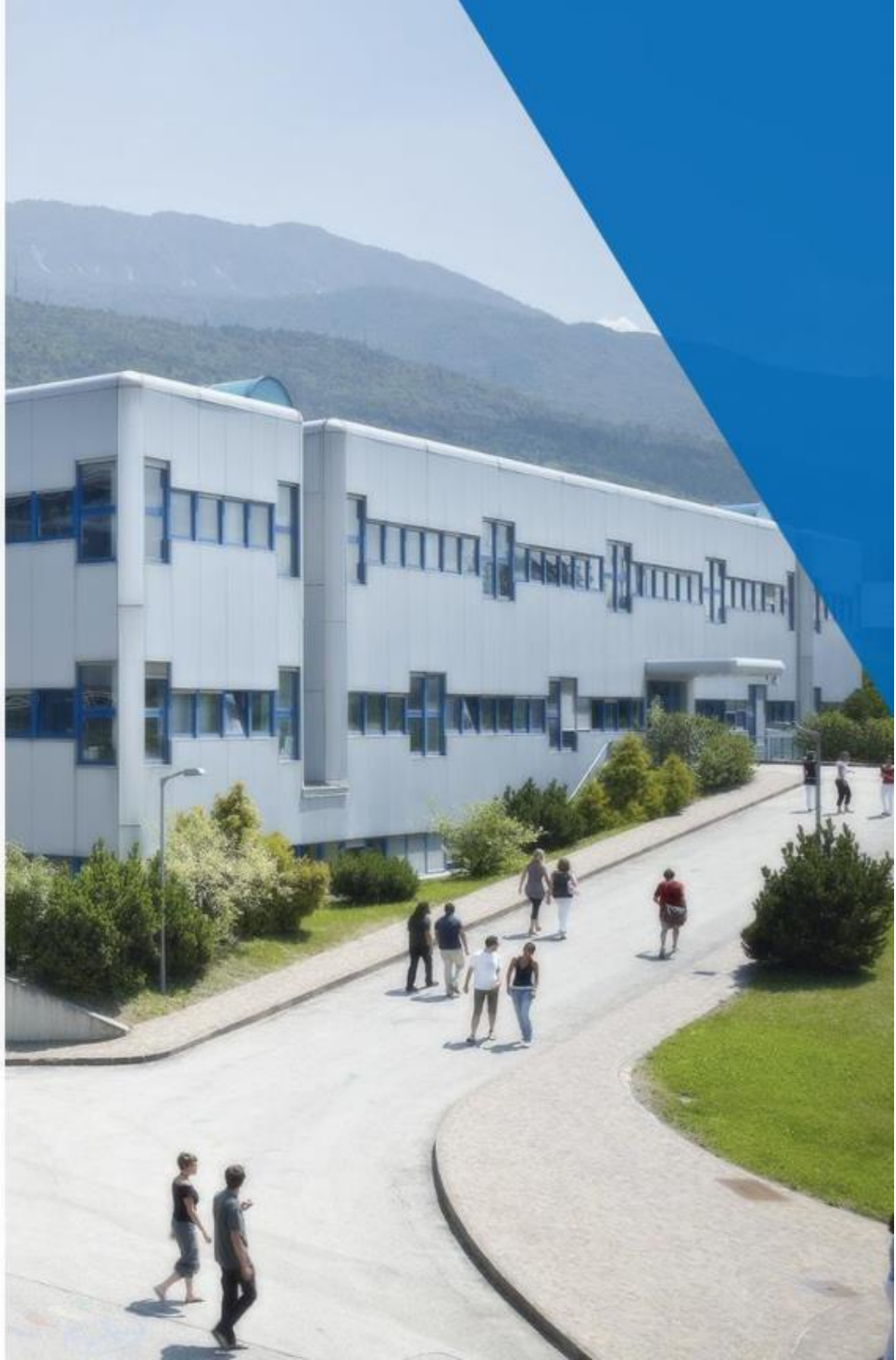
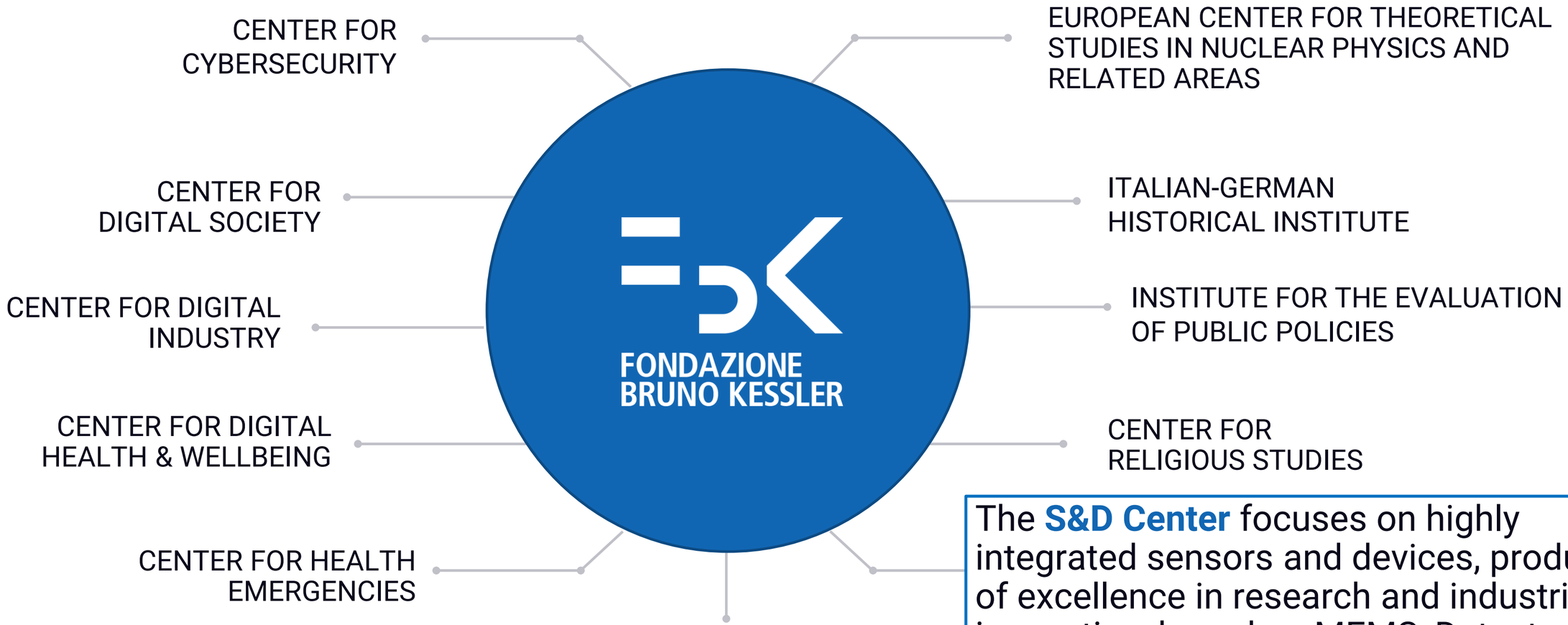
FONDAZIONE
BRUNO KESSLER

FUTURE BUILT
ON KNOWLEDGE



FBK
Research Centers (2021)



The **S&D Center** focuses on highly integrated sensors and devices, products of excellence in research and industrial innovation, based on MEMS, Detectors for HEP and space, photonics and surface functionalization techniques and interfaces

Microfabrication Area

Clean Room Detectors

700 m2; Class 10/100 6 inch pilot line: Ion Implantation, Oxidation, Diffusion, RIE, Deep RIE (silicon and oxide), Lithography (stepper and mask aligner and EBL), metal sputtering

Clean Room MEMS

500 m2 Class 100/1000 diffusion, lithography (mask aligner), wafer bonding, electroplating, Si bulk micromachining, metal evaporation, RIE, mechanical and optical profilometry

Testing Area

300 m2 manual parametric testing, automatic parametric/functional testing, optical testing (spectral responsivity, quantum efficiency)

Integration Area

100 m2 clean room Class 1000 Microassembly station; screen printing, bonding (ball & wedge bonder), Shear-Pull Tester, reflow oven, CNC micro-mill

In progress: 3D Integration Area

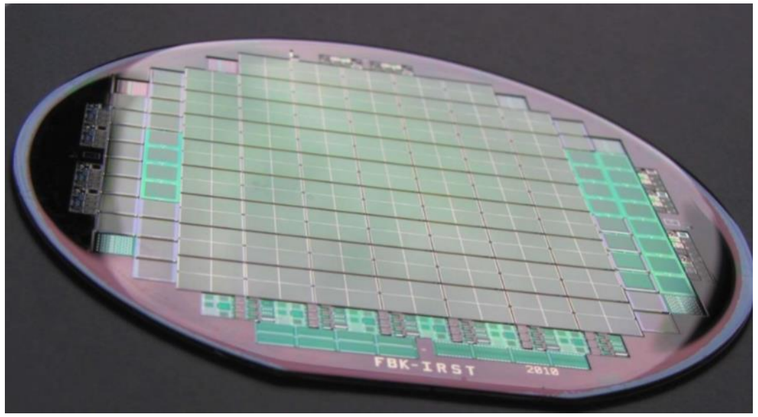
TSV, thinning, trench filling

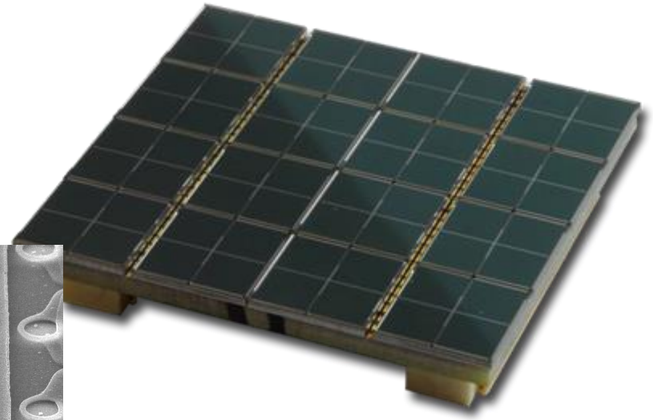
Custom Radiation Detectors

COMPETENCE

Design, production and packaging of innovative Radiation Sensors devices based on silicon compatible technology

- Single-photon detectors (full-custom and standard CMOS tech.)
- Silicon Drift Detectors
- Silicon Strip & pixel , single or double sided
- Low Gain Avalanche Diode
- Si -3D detector





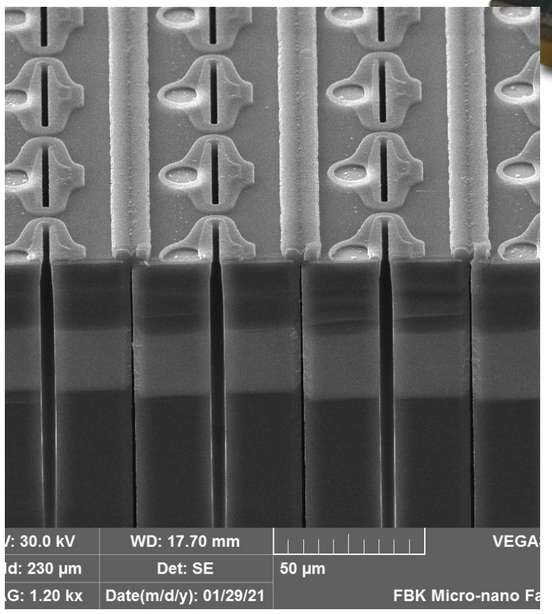
APPLICATION AREAS

Science

- Nuclear and particle physics
- Astronomy
- Space science
- Quantum Science

Industry

- Automotive
- Security and environmental monitoring
- Industrial Quality Control
- Analytical instrumentation
- Applied Quantum Technologies



IPCEI on Microelectronics

- Improving the FBK-SiPM technology integrating **Through Silicon Vias (TSV)**
- Exploiting **TSV** to develop innovative segmented SiPMs for hetero-integration with CMOS electronics or photonics components
- Developing a technology for **high-density 3D integration of SPADs and SiPMs with read-out electronics.**
- The **first prototypes** of integrated devices are expected in **2024**.

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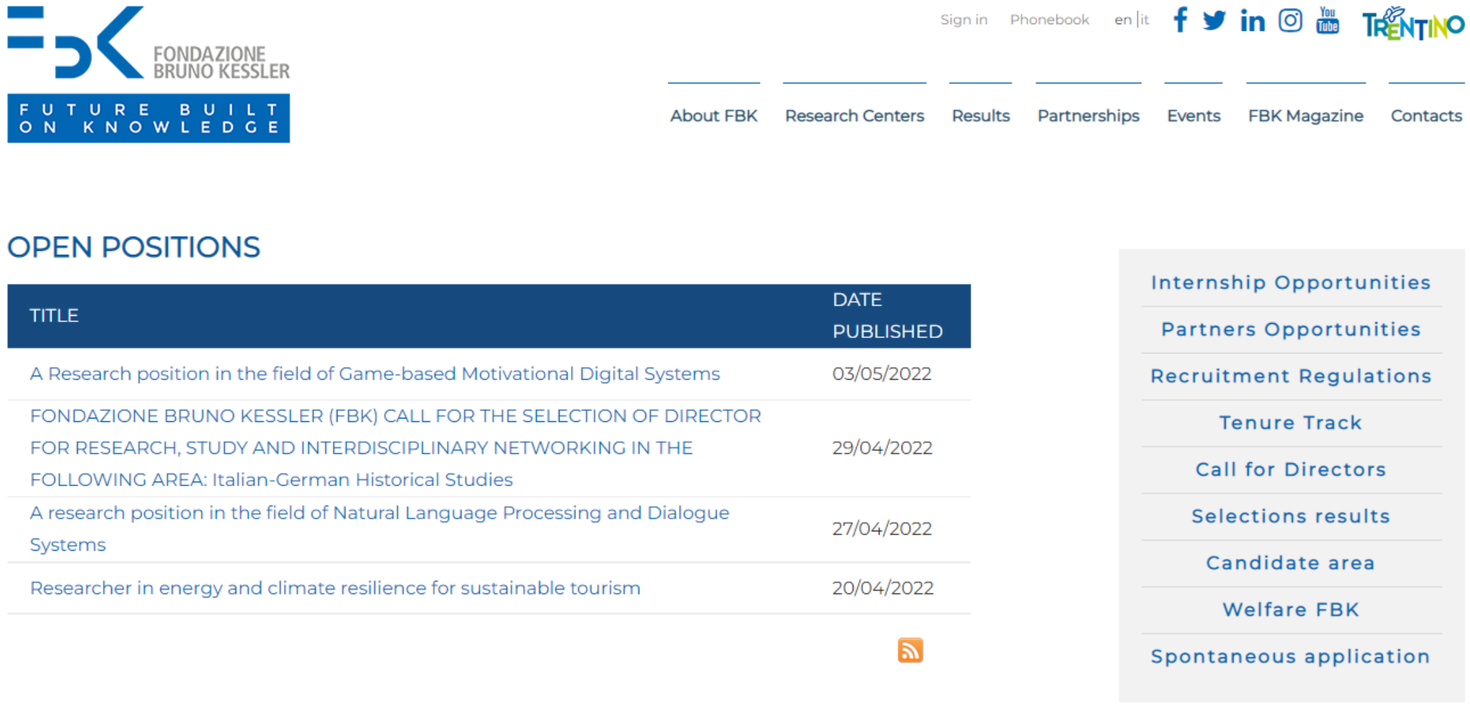

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