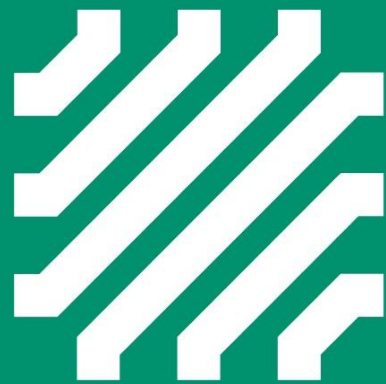
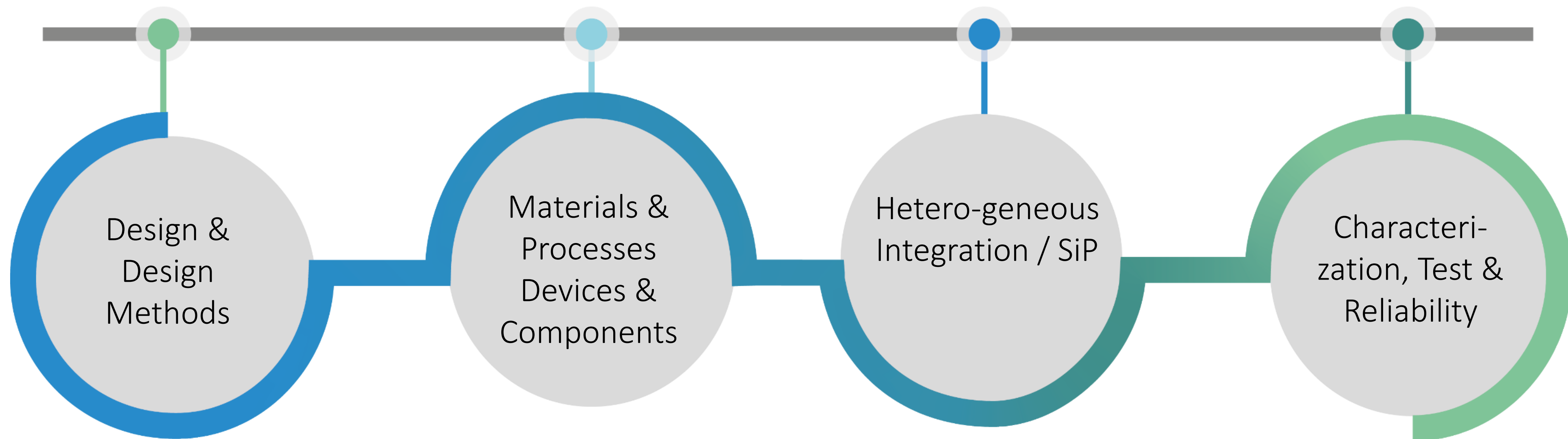


Forschungsfabrik Mikroelektronik Deutschland

Fraunhofer Group for Microelectronics in Cooperation with Leibniz Institutes FBH and IHP

Extended CMOS along the value chain



- Component Design
- Package & System Design
- Prototyping
- Design Methods

- Materials
- Processes
- Desices and Components

- Heterogeneous Integration

- Materials & Devices
- Analysis & Test
- Reliability

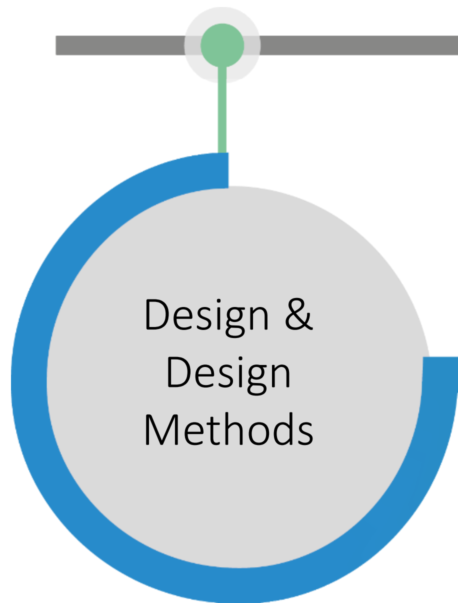
A cooperation of

Fraunhofer MIKROELEKTRONIK

FBH Ferdinand Braun Institut

ihp

Extended CMOS along the value chain



Component Design

- Application specific active and passive component design

Package & System Design

- Design under constraints – functional safety, reliability, harsh environment, yield,…

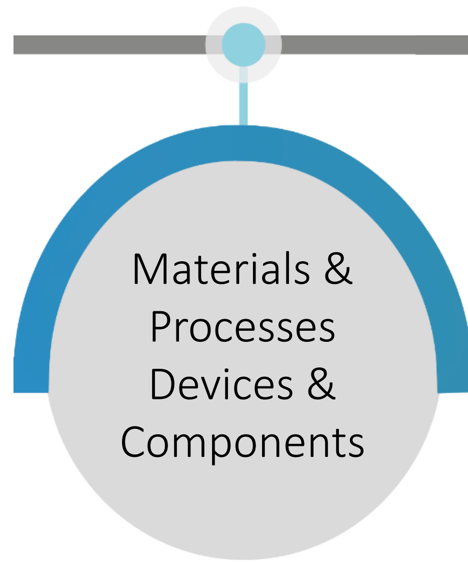
Prototyping

- Hardware-in-the-loop concepts, HW/SW co-design

Design Methods

- Automated design tools for component, module and system development

Extended CMOS along the value chain



Materials

- Si, SiGe, Piezo Materials, Metal-Dichalcogenides, CNT, Graphene,

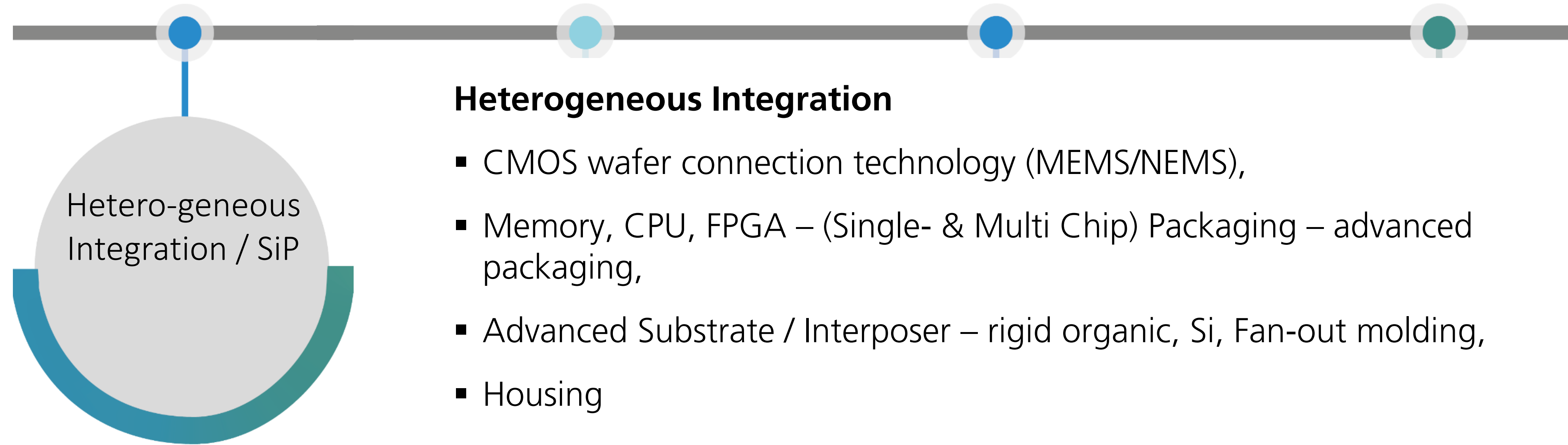
Processes

- 200mm complete BiCMOS/CMOS lines, 300mm FDSOI material and process evaluation line
- Dielectric stacks, BEOL Modules
- Epitaxy, Implantation, advanced etching, ALD

Devices and Components

- CNT FETs…
- High Capacitance Capacitors
- Memories, NVM memories

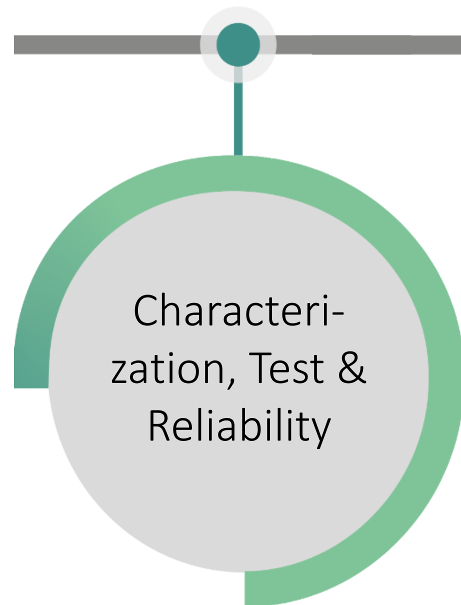
Extended CMOS along the value chain



Heterogeneous Integration

- CMOS wafer connection technology (MEMS/NEMS),
- Memory, CPU, FPGA – (Single- & Multi Chip) Packaging – advanced packaging,
- Advanced Substrate / Interposer – rigid organic, Si, Fan-out molding,
- Housing

Extended CMOS along the value chain



Materials and Devices

- Nondestructive examination of materials and devices, Accelerated lifetime testing and failure analysis, electrical test of semiconductor devices, Device degradation

Analysis and Test

- Automated in-line process monitoring, test of Analog-mixed signal circuits and digital circuits

Reliability

- Device and system/package test under multiple stress scenarios, Combined load testing, lifetime assessments, thermal cycling, Wafer level reliability tests, thermo-electrical and thermos - mechanical reliability.