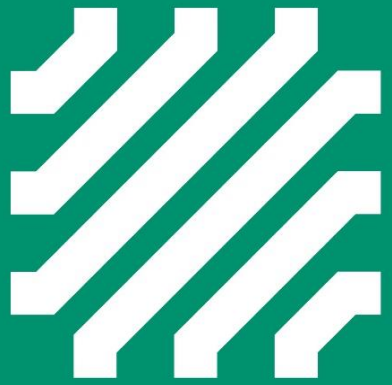


# Forschungsfabrik Mikroelektronik Deutschland

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

Forschungsfabrik Mikroelektronik Deutschland

# Die Forschungsfabrik Mikroelektronik Deutschland

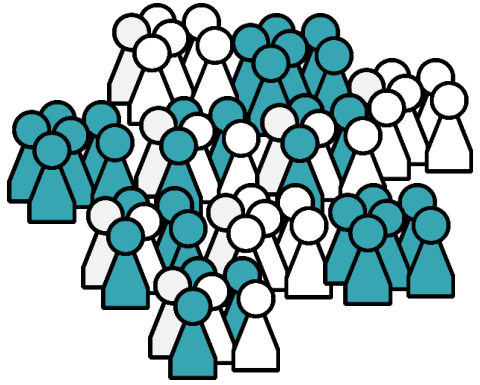
## Ein neuer Ansatz zur Zusammenarbeit in der Fraunhofer-Gesellschaft und Leibniz-Gemeinschaft

Bernd Hintze & Dr. Andreas Grimm

# FMD Facts – A Short Overview

Forschungsfabrik Mikroelektronik Deutschland


The FMD combines the expertise and infrastructure of **13 research institutes** all over Germany to deliver complete developments in an **One-Stop-Shop**.



**Within the FMD more than 2.000 scientists** work together under a single, virtual roof, **3.500 employees** in total.

Total **investment of 350 Mio. EUR** for additional infrastructure and future developments.

SPONSORED BY THE

Federal Ministry of Education and Research

**International Establishment** of the FMD and Cooperation with **European Partners** (e.g. NGC Alliance)

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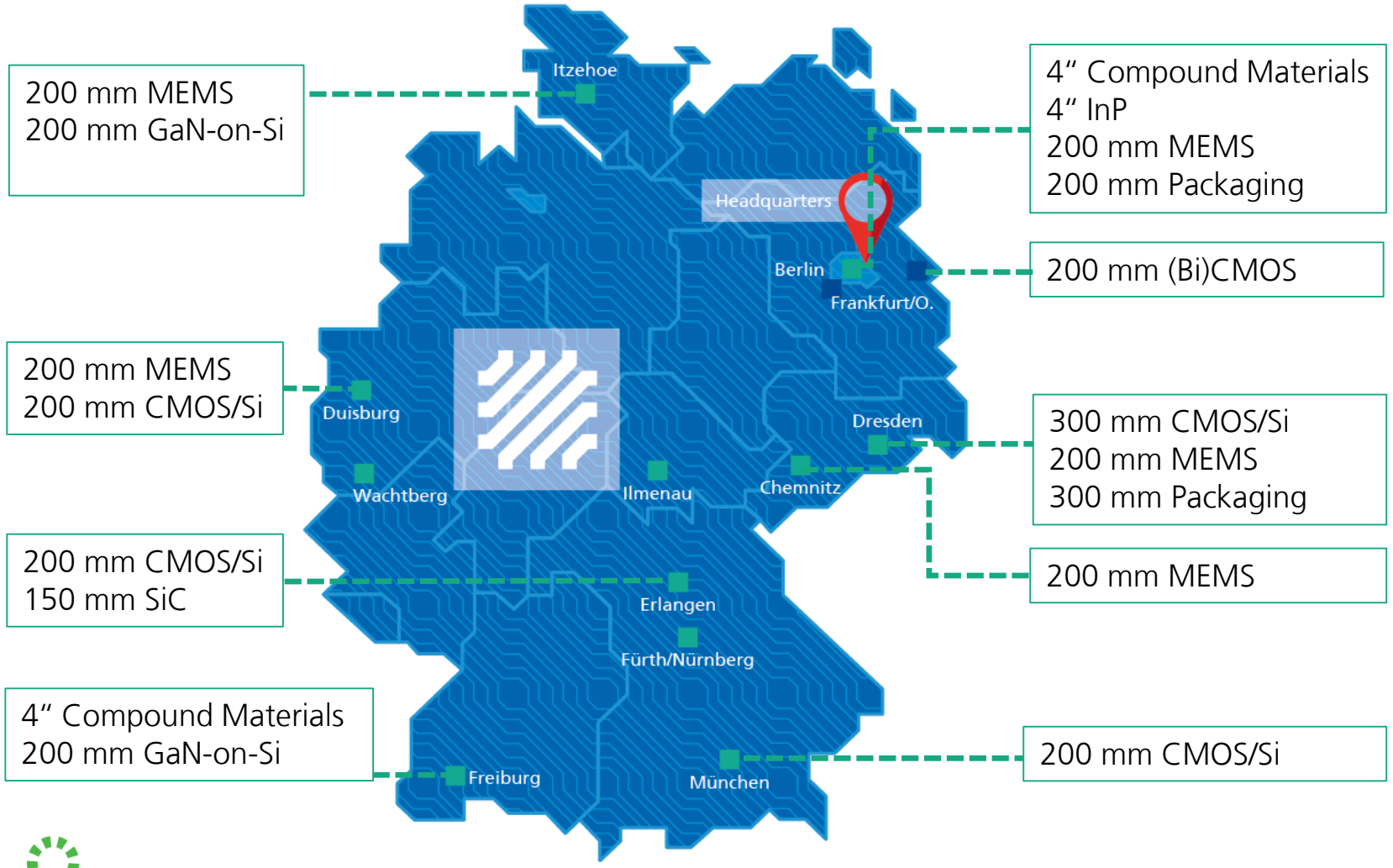
# FMD – Cleanrooms all over Germany

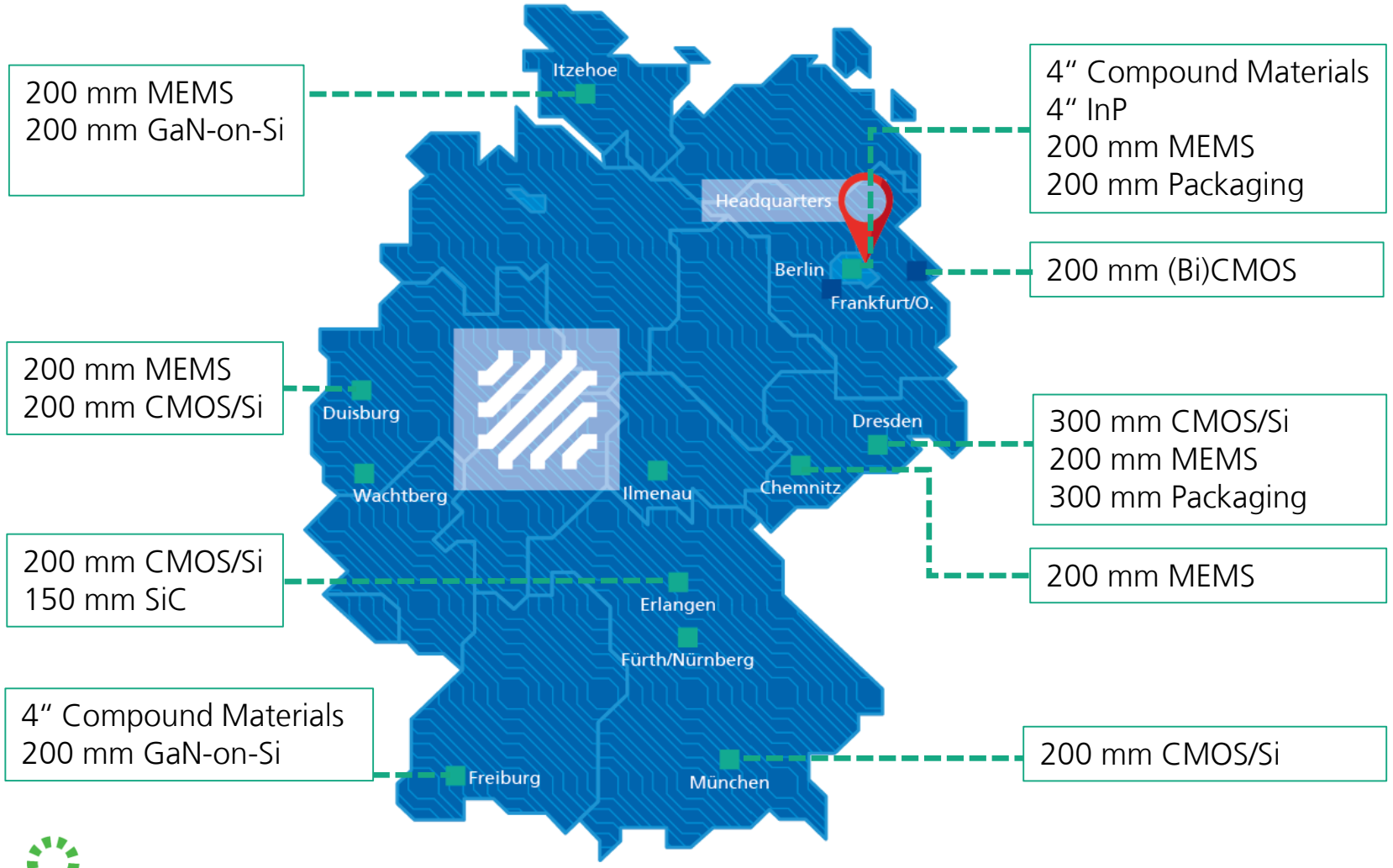
Forschungsfabrik Mikroelektronik Deutschland




- **Operation concepts in alignment**
- Over 2.200 equipment in 13 cleanrooms all over Germany
- Over 10 Mio moves per year
- Overall size: appr. 11.000 m²
- Wafersizes: 2“ till 300 mm

# FMD – Cleanrooms all over Germany

Forschungsfabrik Mikroelektronik Deutschland




- **Operation concepts in alignment**
  - AG Cleanroom
    - Exchange of experiences
    - Leverage synergies with regard to supply goods/materials
    - Establishment of common quality standards, e.g. a general contamination management
    - Discussion of safety & security related topics

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# FMD – Synergetic Crossborder Usage of Infrastructure

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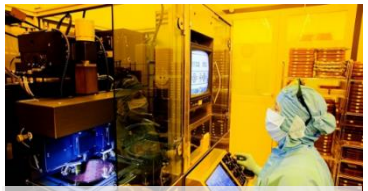
Fraunhofer IMS


Leibniz IHP


Fraunhofer IPMS


Fraunhofer IZM

- One target is the installation of an interfactory manufacturing execution system to combine thirteen cleanrooms
- The systems will allow effective wafer transfer between different cleanrooms and overall logistic processes
- Challenges
  - Alignment of the different cleanroom structures and organisations
  - Installation of integrated crossborder software system
  - Support the institutes to install the system

**„Enterprise MES“**

| MES | MES | MES | MES B |
|---|---|---|---|
| FhI 1 | FhI 2 | FhI 3 | Leibniz |

# FMD Competencies from Technology to Application Along the Entire Value Chain

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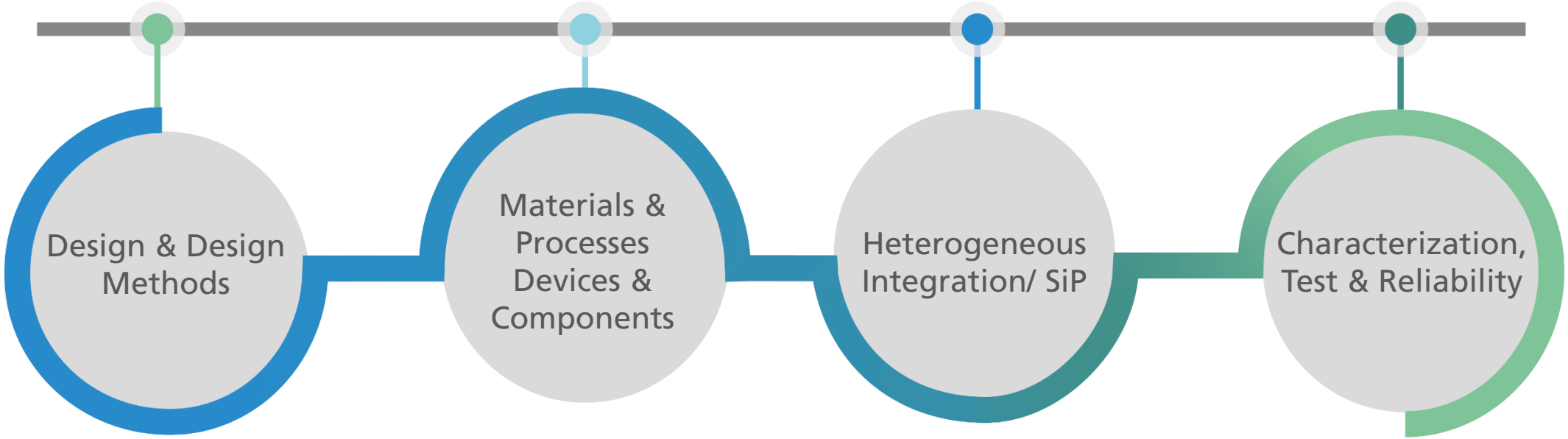



- Component Design
- Package & System Design
- Prototyping
- Design Methods

- Material & Process Development
- Devices & Components Realization

- Component Packaging
- Module & System Packaging
- Assembly & Packaging

- Materials & Devices
- Analysis & Test
- Reliability

# FMD Offer for Customers

Forschungsfabrik Mikroelektronik Deutschland

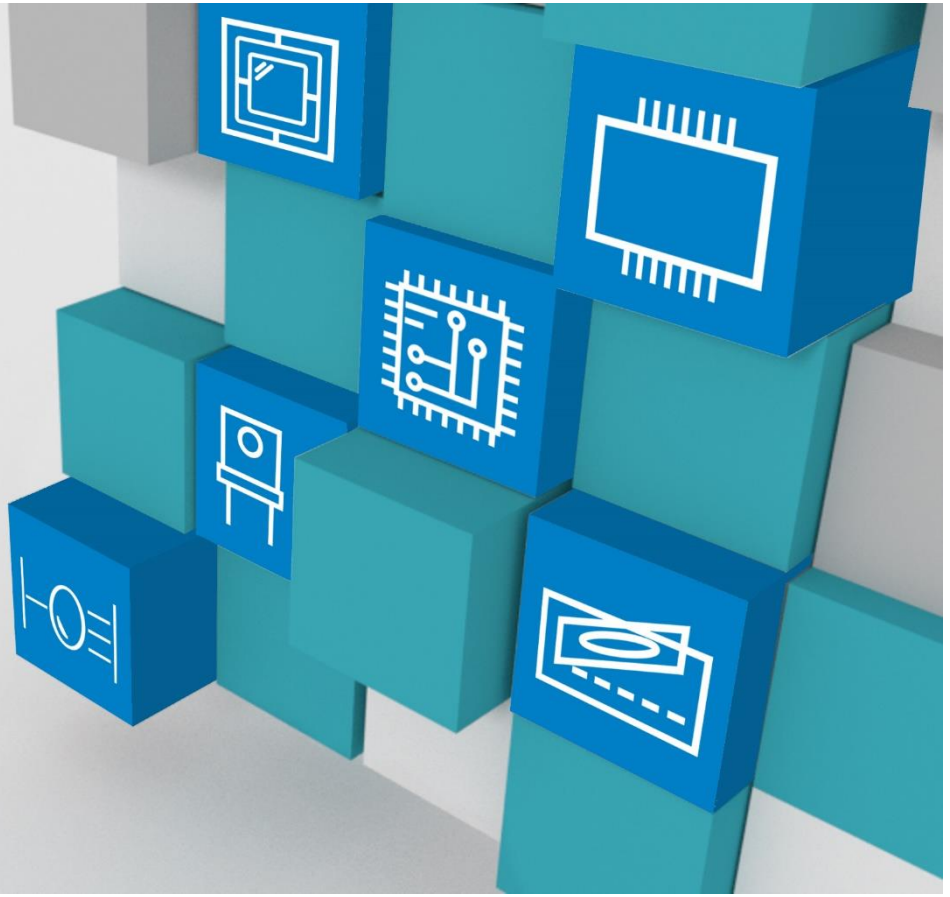

| | |
|---|---|
| **Application Specific Solutions** | Example: S16 Wednesday - 11:55<br>**Solid-State LiDAR: Umgebungssensorik für sicheres autonomes Fahren**<br>Jörg Amelung, Christoph Galle |
| **Technology Platforms** | ▪ 6 Technology platforms along the value chain<br>▪ 2 Design platforms |
| **FMD as a strong Fundament** | ▪ 13 Member institutes of the Fraunhofer-Gesellschaft and Leibniz-Gemeinschaft all over Germany |

# Technology Platforms

Forschungsfabrik Mikroelektronik Deutschland

- Extended CMOS
- Optoelectronic Systems
- Power Electronics
- MEMS Actuators
- Microwave and Terahertz
- Sensor Systems

- *Advanced System Design*
- *Advanced System Integration*



# FMD - One-Stop-Shop for Technologies and Complete Systems

Forschungsfabrik Mikroelektronik Deutschland


- Joint laboratories and shared production facilities
- Globally unique range of know-how in microelectronics for IoT and Industry 4.0
- Tailor-made technological and system developments from a single provider
- Organisation of combined prototype and pilot fabrication, support in specific technology services
- Support of start-up activities

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# DANKE

Das dieser Veröffentlichung zugrunde liegende Vorhaben wurde zum Teil mit Mitteln des Bundesministeriums für Bildung und Forschung unter den Förderkennzeichen 16FMD01K, 16FMD02 und 16FMD03 gefördert.

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Bundesministerium für Bildung und Forschung

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