

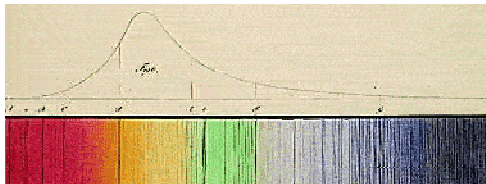
# FRAUNHOFER INSTITUTE FOR MICROELECTRONIC CIRCUITS AND SYSTEMS IMS

Director: Prof. Dr. rer. nat. Anton Grabmaier



# Fraunhofer-Gesellschaft

## Facts



Joseph von Fraunhofer (1787 - 1826)

- Non-profit organization
- Founded in 1949
- 67 institutes
- Total personnel: approx. 24,000 employees
- Budget: More than 2 billion EUR total annual research budget
- Roughly 1.7 billion EUR is generated through contract research



2 425  
, \$ ) 6 &5(  
7  
8\$  
9 8  
\* &" \$\$ ,-. &(!  
&5 :  
&5 : \$ ) ;  
5( : ; ) )

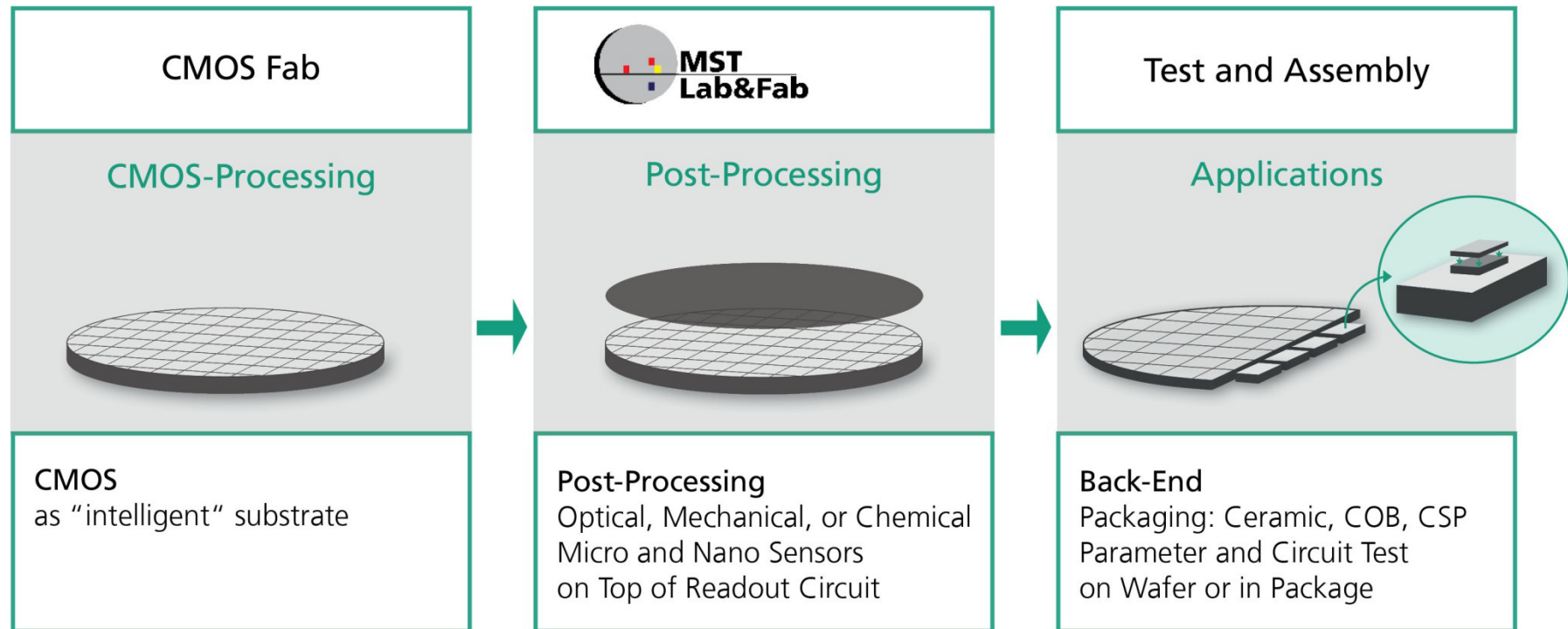
# Fraunhofer IMS

## Competences

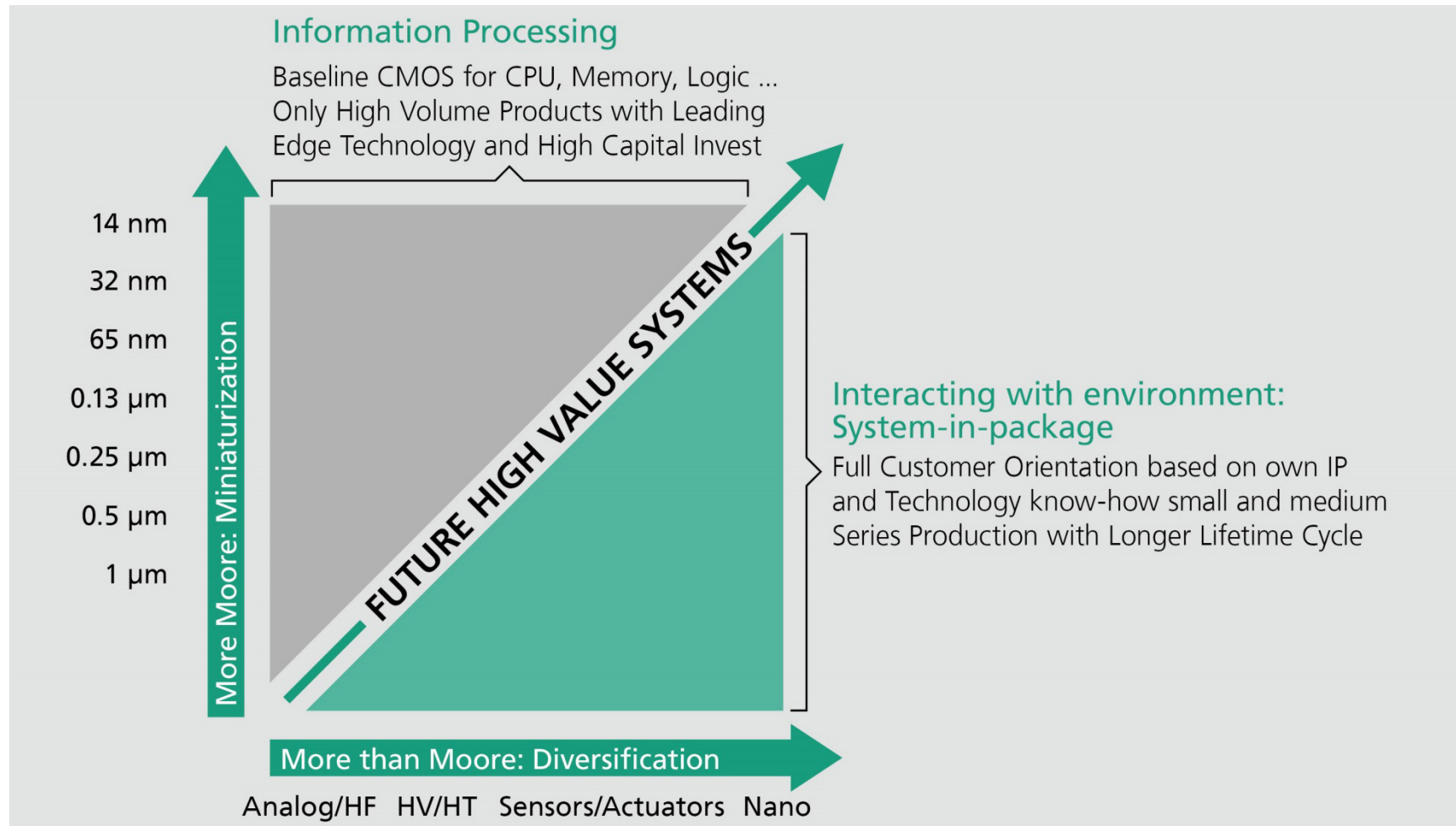
Fraunhofer IMS has been transferring its know-how into customer-specific products for more than 30 years.

- We develop CMOS based systems, operate process development and circuit design as well as ASIC manufacturing.
- As a trendsetter in intelligent microsystems technology (MST) we combine sensors with microelectronic interfaces.
- Our system development integrates sensors with wireless systems into innovative customer products.

# Fraunhofer IMS Infrastructure



# Fraunhofer IMS System Roadmap



# Fraunhofer IMS

## Quality Management System



DIN EN ISO 9001 Certification

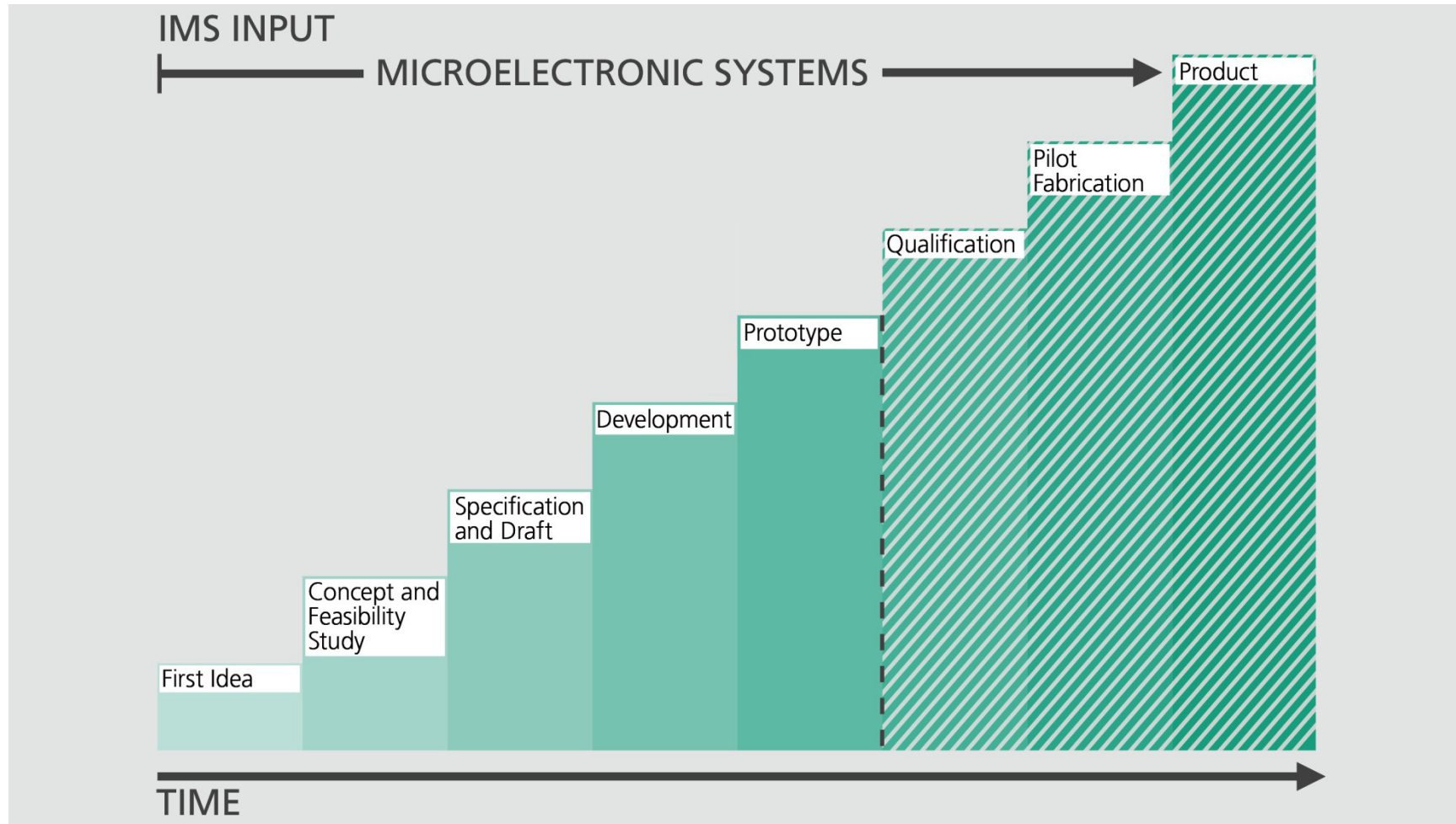


ISO/TS 16949 Certification



# Fraunhofer IMS

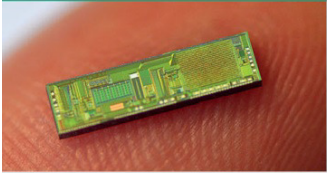
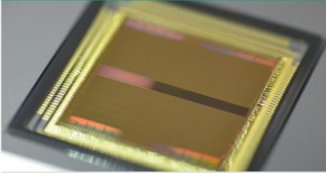

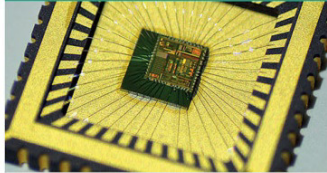
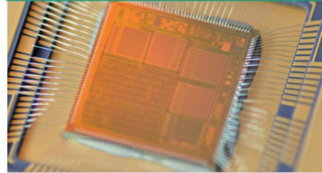
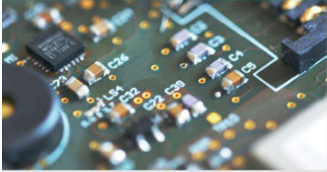
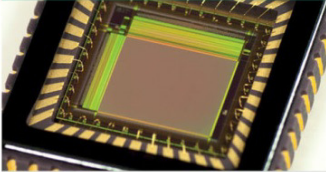
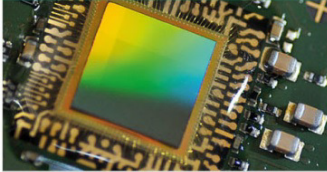
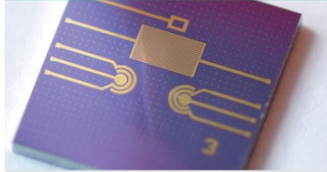
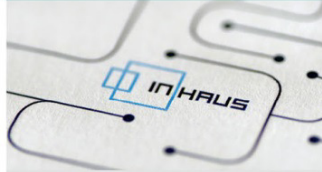
## From Concept to Product





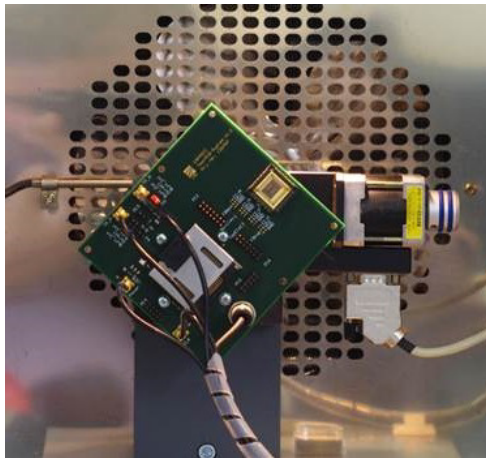
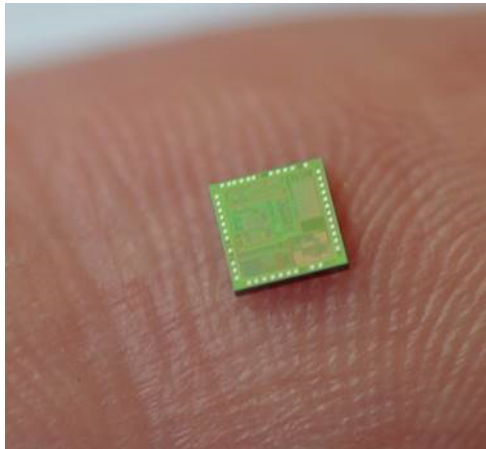
# Fraunhofer IMS

## Business Fields

<p>Pressure Sensor Systems</p>  <p>Pressure Sensors Medical Implants</p>	<p>CMOS Image Sensors</p>  <p>Time-of-Flight Imaging Ultrasensitive Images</p>	<p>Wireless and Transponder Systems</p>  <p>Sensor Transponders and Readers Wireless Data and Energy Transmission</p>	<p>ASICs</p>  <p>Chip-Design Fabrication</p>	<p>High Temperature Electronics</p>  <p>Design for high Temperature SOI CMOS Technology</p>
<p>Electronic Assistance Systems</p>  <p>Embedded Systems Distributed Systems and Networks</p>	<p>Devices and Technologies</p>  <p>CMOS Processes Smart Sensors</p>	<p>IR Imagers</p>  <p>Read-out Circuits Infrared Sensors</p>	<p>Biohybrid Systems</p>  <p>Glucose and Lactate Sensors Bio Sensors</p>	<p>inHaus-Center</p>  <p>Innovation Incubator Common Research and Development</p>

# Reference Projects: ASICs (IC)

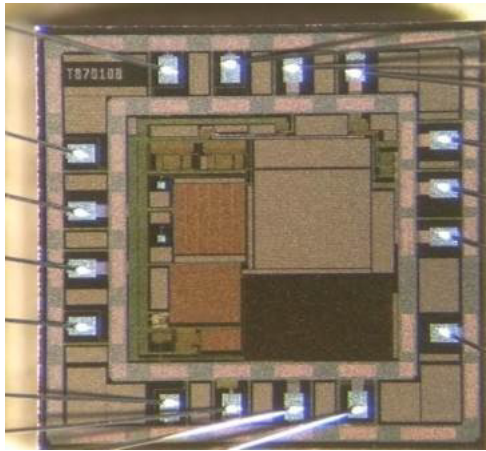
## Capacitive Readout IC



- Key Specifications
  - Input referred noise down to 60 zF/Sqrt(Hz)
  - Bandwidth: 0 Hz – 10 kHz
  - Dynamic range: 120 dB
  - Measurement range:  $\pm 0.75$  pF –  $\pm 3.0$  pF
- Unique Selling Points
  - Integrated temperature sensor for MEMS TCO compensation
  - 4 tunable gain settings
  - Internal trimming capacitances: each up to 1 pF
  - Optional 11 bit ADC and digital interface

# Reference Projects: High Temperature Electronics

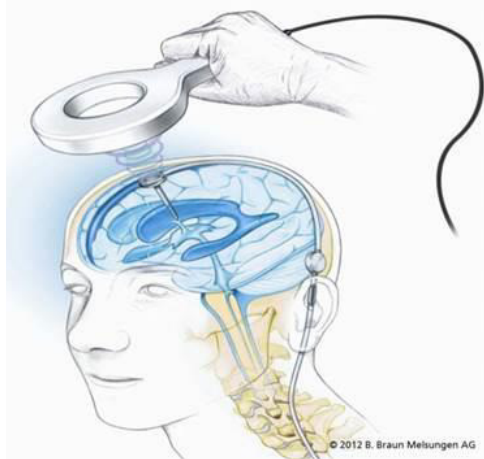
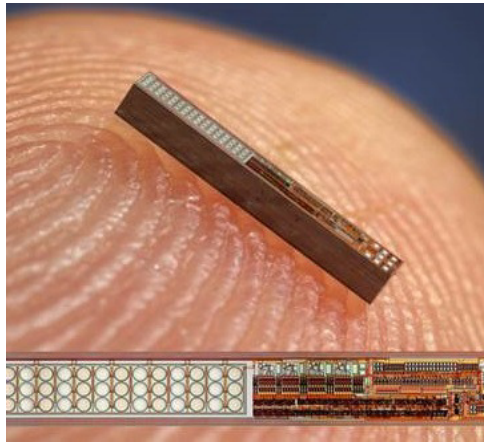
## High Temperature Proximity Switch



- Key Specifications
  - Operating temperature up to 250 °C
  - Configurable output (NPN, PNP, NO, NC)
  - Adjustable switching distance (up to x2)
  - On-Chip calibration
- Unique Selling Points
  - Sensor electronic for harsh environment
  - High temperature operation
  - SOI CMOS integrated solution
  - No detached electronics

# Reference Projects: Pressure Sensor Systems (PSS)

## Shunt Sensor



- Key Specifications
  - Wireless measurement of intracranial pressure
  - The transponder is encapsulated in metal
  - HF-frequency: 133 kHz
  - Operation distance 0 – 5 cm
- Unique Selling Points
  - Low power consumption and miniaturization
  - Transponder capability
  - Manufacturing of ASIC and reader unit
  - ASIC and reader for approved medical implants

# Fraunhofer IMS

## Contact

### **Michael Bollerott**

Head of Marketing and Sales

Phone +49 203 3783-227

Email [vertrieb@ims.fraunhofer.de](mailto:vertrieb@ims.fraunhofer.de)

# Picture Credits

- © Fraunhofer-Gesellschaft  
Page 2: Picture 2, 3
- © Foto Deutsches Museum  
Page 2: Picture 1
- © Fraunhofer Mikroelektronik / Kracheel  
Page 6
- © Krischerfotografie  
Page 8: Picture 2 / 38: Picture 1
- © PNSensor GmbH  
Page 20: Picture 2
- © B. Braun Meisungen AG  
Page 30: Picture 2
- © MEV Verlag GmbH  
Page 38: Picture 2
- © Markus Steur  
Page 38: Picture 4

Any other images: © Fraunhofer IMS