DIT Campus in Eastern Bavaria

**Cham**
- Mechatronics & Cyber-physical Systems
- Automation Technology

**Teisnach Sensors**
- Integration of sensors into existing production lines
- Material development in the field of sensors

**Teisnach Optics**
- Optical Technologies
- High-Frequency Technology

**Spiegelau**
- Glas-Melting Technology

**Grafenau**
- Supply Chain Management
- Data Analytics & Big Data

**Freyung**
- Applied Computer Sciences
- Bionics

**Bad Kötzing**
- Health Management, TCM

**Weißenburg**
- Polymer Technology

**European Campus Rottal-Inn**
- International campus, English is the language of instruction

**Deggendorf Institute of Technology**
### The Technology Campuses

<table>
<thead>
<tr>
<th>Campus</th>
<th>Focus Areas</th>
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| **TC Teisnach Sensors** | - Integration of sensors into existing production lines  
- Material development in the field of sensors |
| **TC Teisnach Optics** | - Optical Technologies  
- High-Frequency Technology |
| **TC Freyung**     | - Applied Computer Sciences  
- Bionics |
| **TC Cham**        | - Mechatronics & Cyberphysical Systems  
- Automation Technology |
| **TAZ Spiegelau**  | - Glass-Melting-Technology |
| **TC Bad Kötzting**| - Health Management |
| **TC Weißenburg**  | - Polymer Technology |
| **TC Grafenau**    | - Supply Chain Management  
- Data Analytics |
Value Chain: Production and integration of sensors at the Technology Campus Sensors Teisnach

Prof. Dr. Maria Kufner
1. Technology Campus Teisnach Sensors:
   • Why a Campus „Sensors for Industry 4.0“?
   • Course Structure
   • Organization
   • Concept

2. Facts 2019

3. Topics
   • Hierarchical process of a feasible added value
   • Focus on the example of an SMD Package
   • Equipment

4. Conclusion

5. Orders and operational issues
Strategy and objectives:
- Development of integration approaches for existing sensor systems in production facilities for quality improvement and cost reduction
- Development of new sensor concepts for industrial applications
- Basic research in the field of sensor materials and integration

Mission:
- Transfer of worldwide research results to local companies
- Worldwide collaborative partner for research and development in the field of sensor applications, sensor integration and new materials for sensor technology

Vision:
- Enhancing the competitiveness of regional enterprises through technology transfer
- Worldwide network node in the field of sensor applications, integration of sensors into existing production lines and material development in the field of sensors.
Technology Campus Teisnach Sensors: Course Structure

Bachelor of Science/Engineering/Arts

Semester:
1 2 3 4 5 6 7

Internship

Bachelor Thesis

Master

Master of Science/Engineering/Arts

8 9 10

Dissertation
PhD

Dissertation in Cooperation with a University

Students at the TCTS (without lectures)
Technology Campus Teisnach Sensors:
Organization

Scientific Director
TC Teisnach Sensors
Prof. Raimung Förg

Scientific Director
TC Teisnach Sensors
Prof. Dr. rer. nat. Maria Kufner

Operational Management
TC Optics & Sensors Teisnach
Alexander Haberl

+ Project engineers
+ Technical staff
Permanent staff

- **Techn. employees**
  - Operation of machines, responsible for laboratories, processing of orders,

- **Team assistance**
  - Organization of events, orders, account assignments, public relations, part-time employee

- **Operational management**
  - Responsible for technical personnel, finances, orders, organization of operational processes
Technology Campus Teisnach Sensors: Concept / Basement
Technology Campus Teisnach Sensors:
Concept / 1st floor

Room types:
- Office
- Meeting
- Infrastructure
Facts 2019

Scientific management: 2 professors

Employees: 9 scientists, engineers, technical staff

Students: ca. 10 (Master/Bachelor/Internship)

Current Projects: 6
Projects in transit / in collaboration with HS Coburg: 2
Proposed Projects: 2
PräBieD
Development of a manufacturing process for extraterrestrial X-ray mirrors

MiWeBiQ
Microwave-assisted bending of quartz glass

Liancaféco
Production process for the manufacture of CFRP components by means of light heating

Glaskugel filter
Development of a photocatalytic liquid filter with coated glass spheres

LED Flächenleuchte
Development of a high-performance lighting unit using an indirect source

µSpin
Surface plasmon resonance for the detection of ageing processes in oils
Projects

mOOS

Miniaturization of an optical surface wave spectrometer for non-contact material testing

Asymode

Process development for the industrial production of planar integrated multimode optical waveguides in glass for asymmetric splitting

Projects in transit / in collaboration with HS Coburg
Projects

- **PräLiFa**
  Development of high-precision lenses for optical metrology

- **CUBS2**
  Ultrasonic-based gas and liquid sensor

Proposed Projects
Topics
Hierarchical process of a feasible added value

- Production/Processes
- Production facilities
- Sensors
  - Elementary sensors
  - Primary signal processing
- Functional elementary sensor
- Sensor principle
- Sensor materials
- Packaging
- Packaging Material/Surfaces

Focus TCTS
Future „TCTS“
Topics
Focus on the example of an SMD Package

Bonding, Die attach
Wiring, precision mechanics
Packaging Prototyping
Sensor materials (2D Materials, Dielektrika, magnetic Materials)
New Materials, glass, glass ceramics

„Cross-section of a package/sensor/elementary sensor“
Equipment

Fanuc Robodrill alpha21MiA5

3 axis machining center / 5 axis precision machining center

Kern EVO
(will be exchanged by a HSC system)
Equipment

Autodesk Inventor
Comsol Multiphysics
Openmind Hypermill
Tebis
Zemax

CAD System / CAM System / CAE
Equipment

SLA 3D Printer
Zotrax Inkspire

FFM 3D Printer
Prusa MKi3s

X-ray photoelectron spectrometer (XPS)

Quorum Q300 Coating equipment PVD (in transit)

Rapid Prototyping / Spectrometer / Coating
Olympus LEXT OLS 4100
Confocal Laser Scanning Microscope

Pulsed Laser Deposition
(in purchasing)

5 axis Ultra short pulse laser processing
(in purchasing)

X-ray photoelectron spectrometer (XPS)

Laser scanning / Laser processing
Chamber furnace (in purchasing)
Tube furnace (in purchasing)
Optocraft SHS Inspect RL Shack-Hartmann wavefront sensor (in transit)
Nanotech 140 GPM Moore Nanotechnologies (in transit)
WITec alpha300 R Confocal Raman microscope (at THD)

Furnaces / wavefront sensor / Precision molding / microscope
• Integration of sensors into production processes

• New materials for sensors

• Sensor elements and components

• Packaging of sensors for special applications

• New manufacturing processes
Thank you for your attention!