

## Taking Innovation Abroad – Technology Transfer in Germany

DWIH: 05.11.2023

**Dr. Lorenz Granrath**

**Workshop Digital Medicine of Tohoku University @ Berlin Science Week 2021**

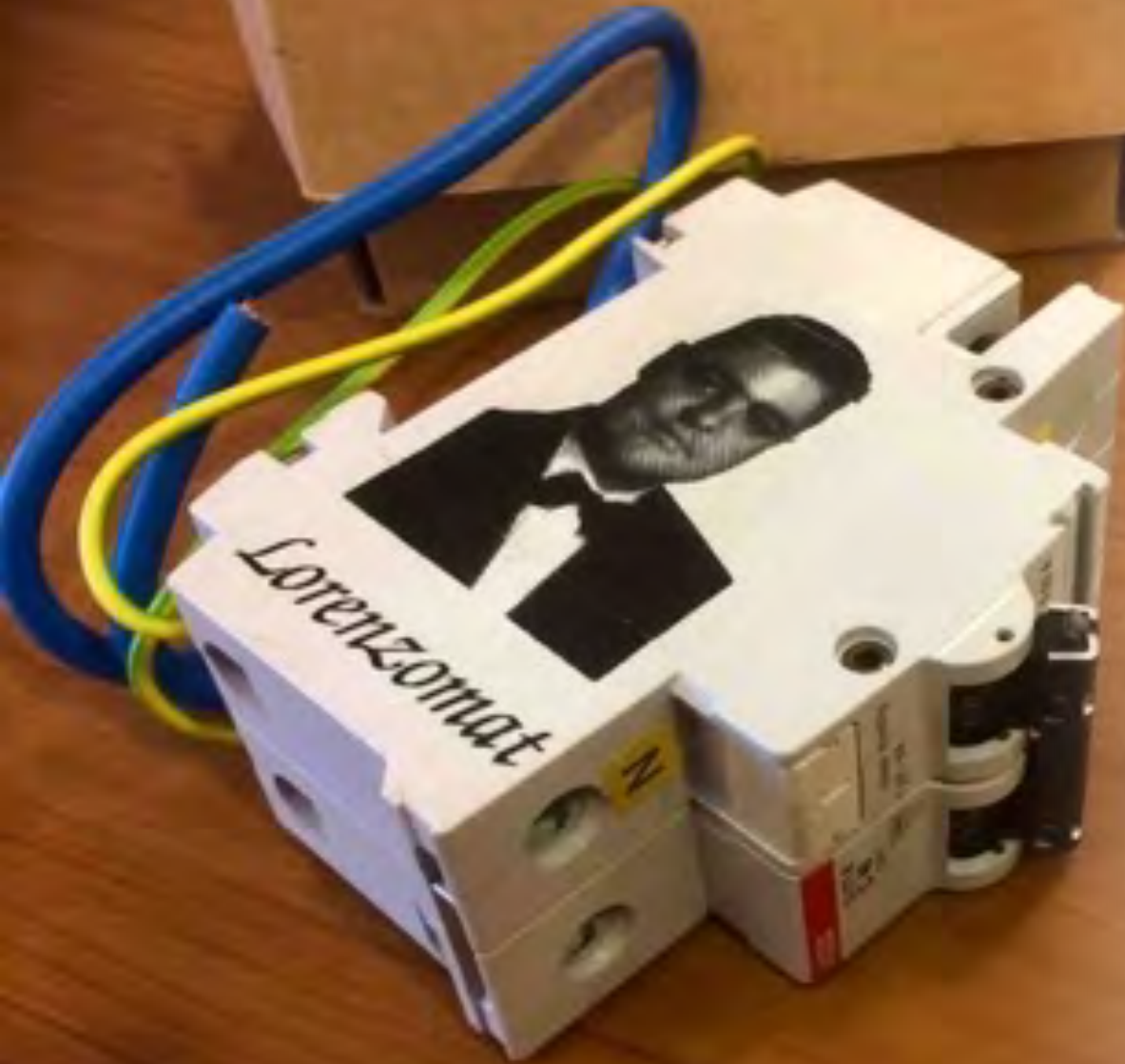
# Dr. Granrath Education / Experience

## EDUCATION

- 1990 KIT: Dipl.-Wirtschaftsing. (Bus./Eng./Inform.)  
& Fraunhofer-ISI: Assistant Researcher
- 1993 Tokyo University: Visiting Researcher
- 1994 Sankt Gallen University, CH: Dr. oec

## PROFESSIONAL EXPERIENCE

- 1994 COMMERZBANK AG: Trainee Intern. Banking
- 1995 ABB STOTZ KONTAKT: Project Manager
- 1997 GMD (National IT Research): Liaison Officer
- 2001 Fraunhofer Japan: Representative
- 2014 AIST: Supervisory Innovation Coordinator
- 2021 Tohoku University-SARC: Project Professor
- 2022 IXP Institute of Psychophysiology



# 2001 Fraunhofer Japan / 2014 AIST / 2021 Tohoku U. / 2022 IXP..



3 -> 12 M. €

iREX  
2009



2010



German-Japanese Solar Day



Fraunhofer IFAM AIST

FRAUNHOFER INSTITUTE FOR MANUFACTURING TECHNOLOGY AND ADVANCED MATERIALS IFAM

**AIST @ IFAM - WORKSHOP ON JOINT R&D IN ADHESIVE BONDING AT FRAUNHOFER IFAM**  
October 25<sup>th</sup> and 26<sup>th</sup> 2016



2016

2012

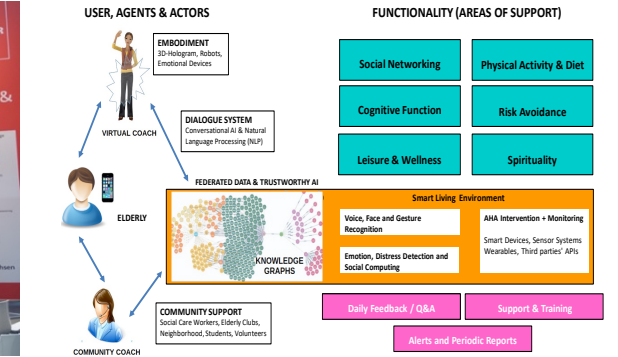
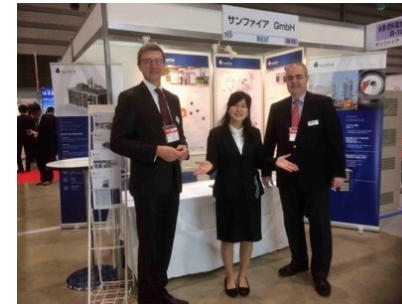
Fraunhofer ENAS TOHOKU

Fraunhofer Project Center  
NEMS/MEMS Devices and  
Manufacturing Technologies  
at Tohoku University



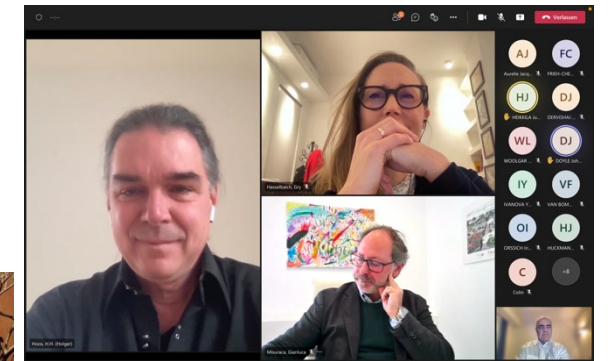
HMI 2019

2018: REIF



2021 e-VITA (Tohoku U. / IXP)

2021/22 InTouchAI.eu



2018: Industry 4.0 (APO)

# Content

Introduction

Technology Transfer in Germany

Collaboration with Japan

# Technology Transfer (TT)

**„Research transforms money into knowledge ...  
technology transfer transforms knowledge into money.“**

*Geoffrey Nicholson, father of the Post-It \**

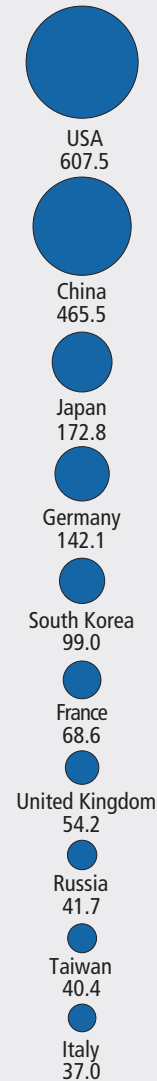
**Technology transfer (TT)** is the process of transferring technology from the person or organization that owns or holds it to another person or organization, in an attempt to **transform inventions and scientific outcomes into new products and services that benefit society.** <sup>[\*]</sup>

[\*] *Competence Centre on Technology Transfer*. European Commission. 30 January 2020

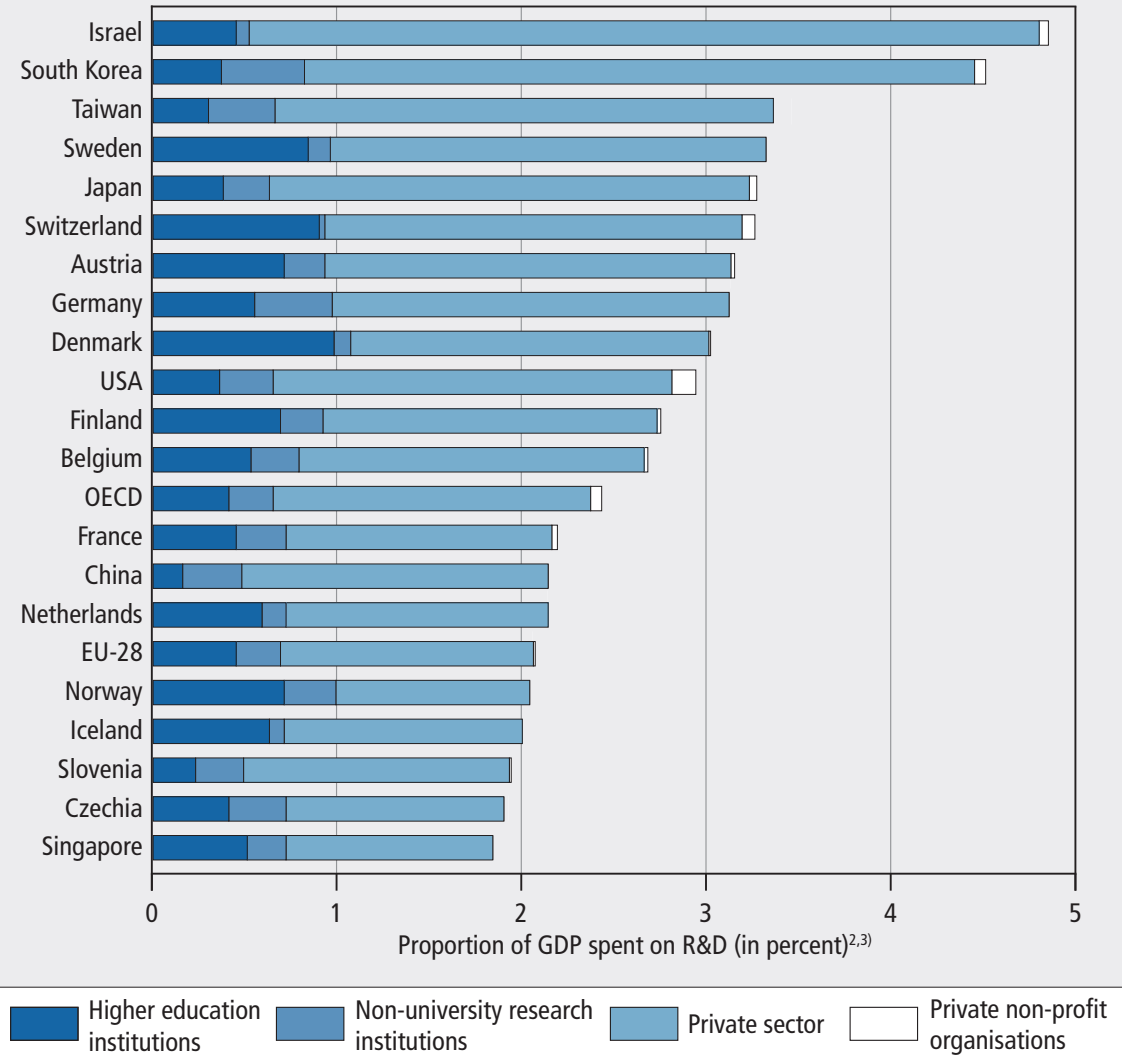
# Japan: more R&D, more in Company labs!

Absolute expenditure in ppp!!!

R&D expenditure (in absolute figures) 2018 by country (in US\$ billion)<sup>1)</sup>



Relative proportion of GDP allocated to R&D in 2018 by country and sector



<sup>1)</sup> Nominal expenditure, converted to US\$ purchasing power parities.

<sup>2)</sup> Includes provisional data and OECD estimates.

<sup>3)</sup> This reporting sample is restricted to countries whose expenditure on R&D was equivalent to or greater than 1.8 percent of their GDP in 2018.

# Economic Uniqueness Germany

- Germany  
"Mittelstand": strong SME sector (< 1000 staff)  
"Hidden Champions": niche-market leader, owner SME no own R&D labs, need R&D with high TRL
- Japan  
Big industrial groups, traditionally with own research, Hitachi CRL opened 1943!  
=> few collaborations with public R&D

## Hidden Champion: Mennekes



Mennekes: Stecker für die E-Mobilität  
© picture-alliance/ ZB

## Horizontal Keiretsu



Sumitomo Corp



MITSUBI&CO.



## Vertical Keiretsu:

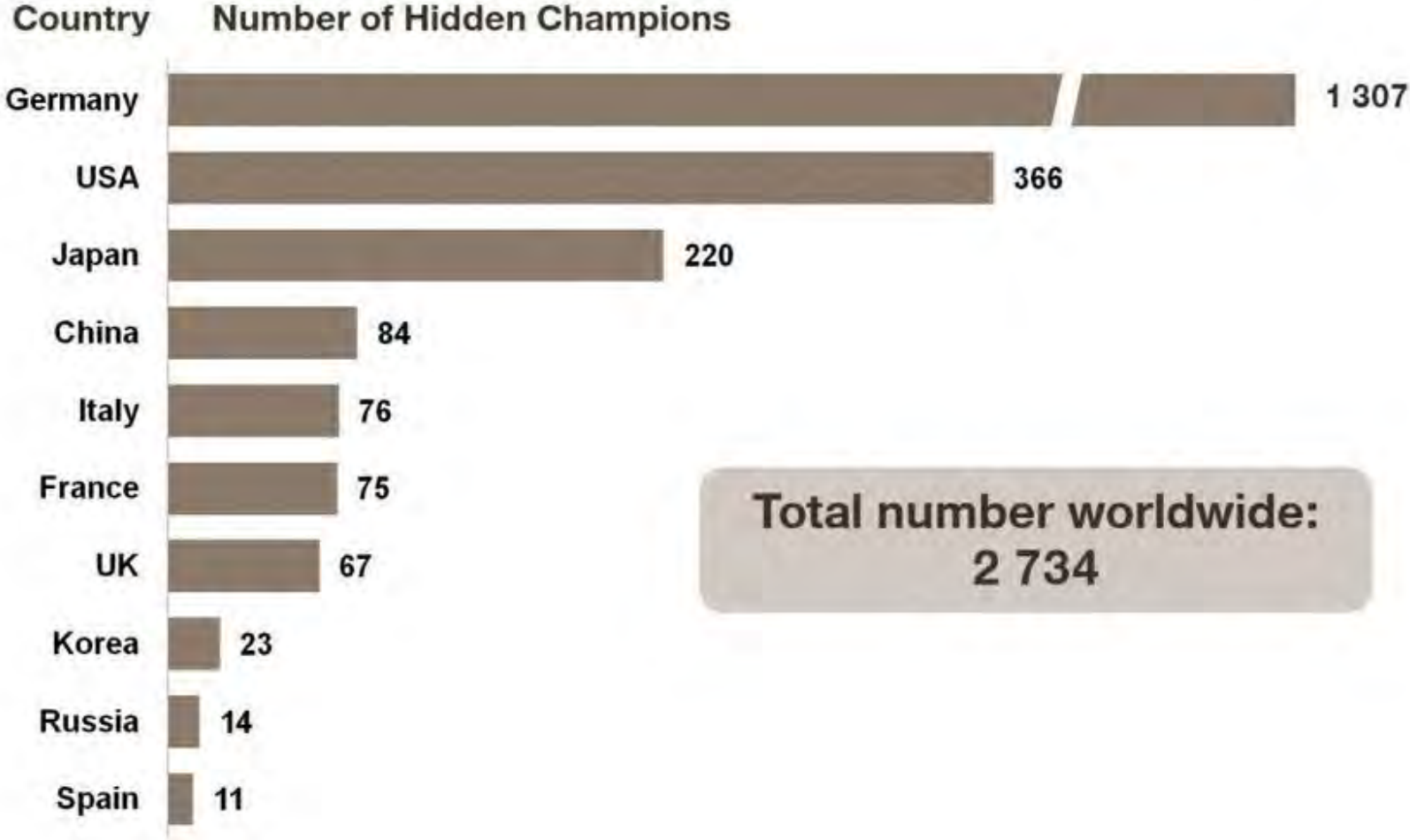


Hitachi, Ltd.

**TOSHIBA**

**Hidden Champions in Germany**  
(Prof. Hermann Simons)

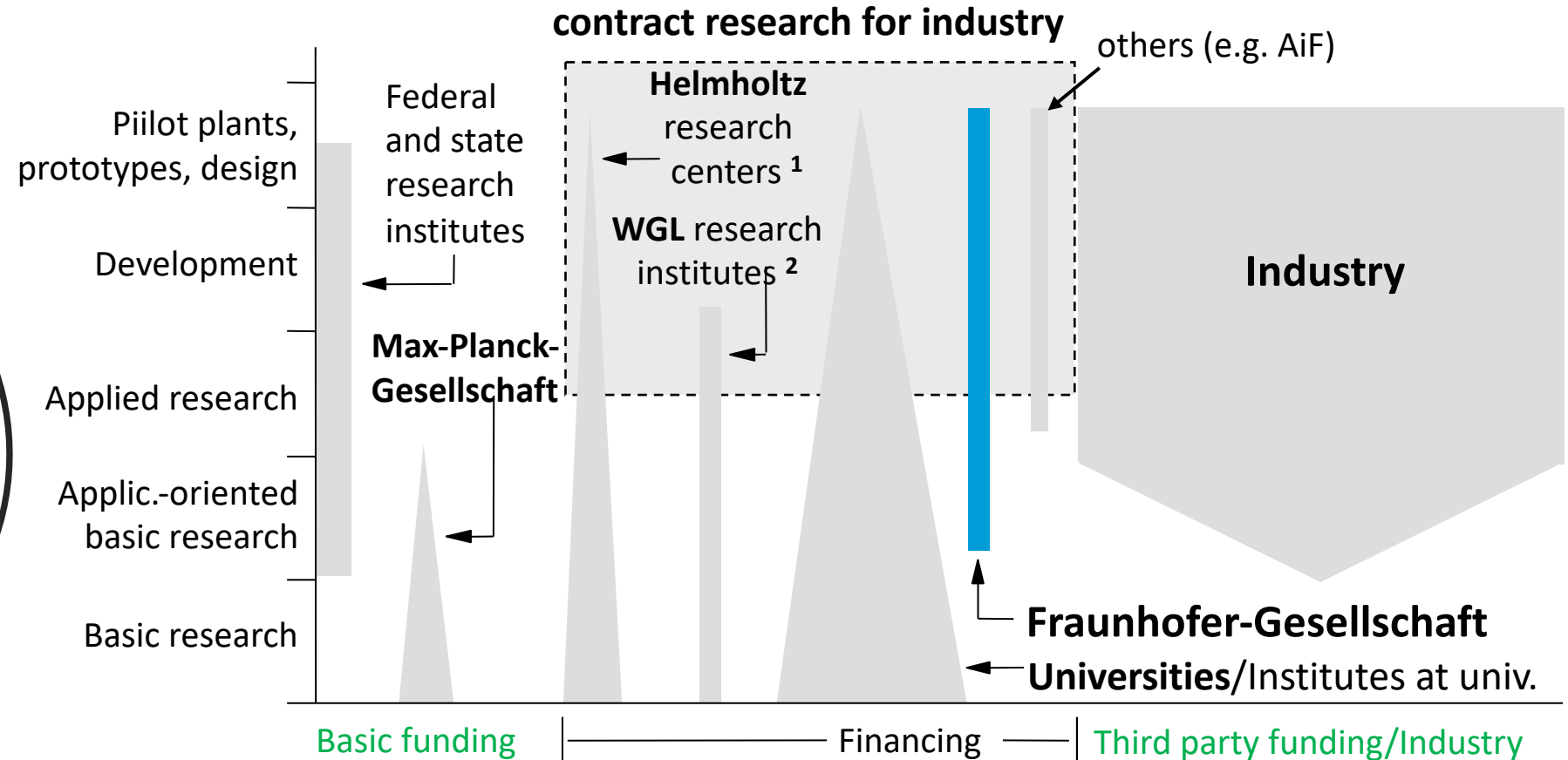
### Hidden Champions By Country



Hidden champions by country SIMON KUCHER & PARTNERS



# Germany R&D Landscape



- 1 Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren (HGF)
- 2 Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz (WGL)
- 3 Arbeitsgemeinschaft industrieller Forschungsvereinigungen 'Otto von Guericke' e.V.

Source: Fraunhofer Gesellschaft

# How is Technology Transfer done

Transfer done by:

- Universities / Research Institutes / Industry
- Public support organisations
- Technology Clusters
- Private TT companies/consultants

Transfer through:

- R&D projects with industry or academia
- heads: researcher starts to work for industry
- licensing of patents
- Start-up by the researcher
- teaching technology to professionals

# Content

Introduction

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# Fraunhofer Technology Transfer: Contract Research

**Fraunhofer**  
Fraunhofer-Gesellschaft

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DEUTSCH

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**BUDGET**  
30% Federal and Länder  
70% Project revenue  
2019; source: Fraunhofer

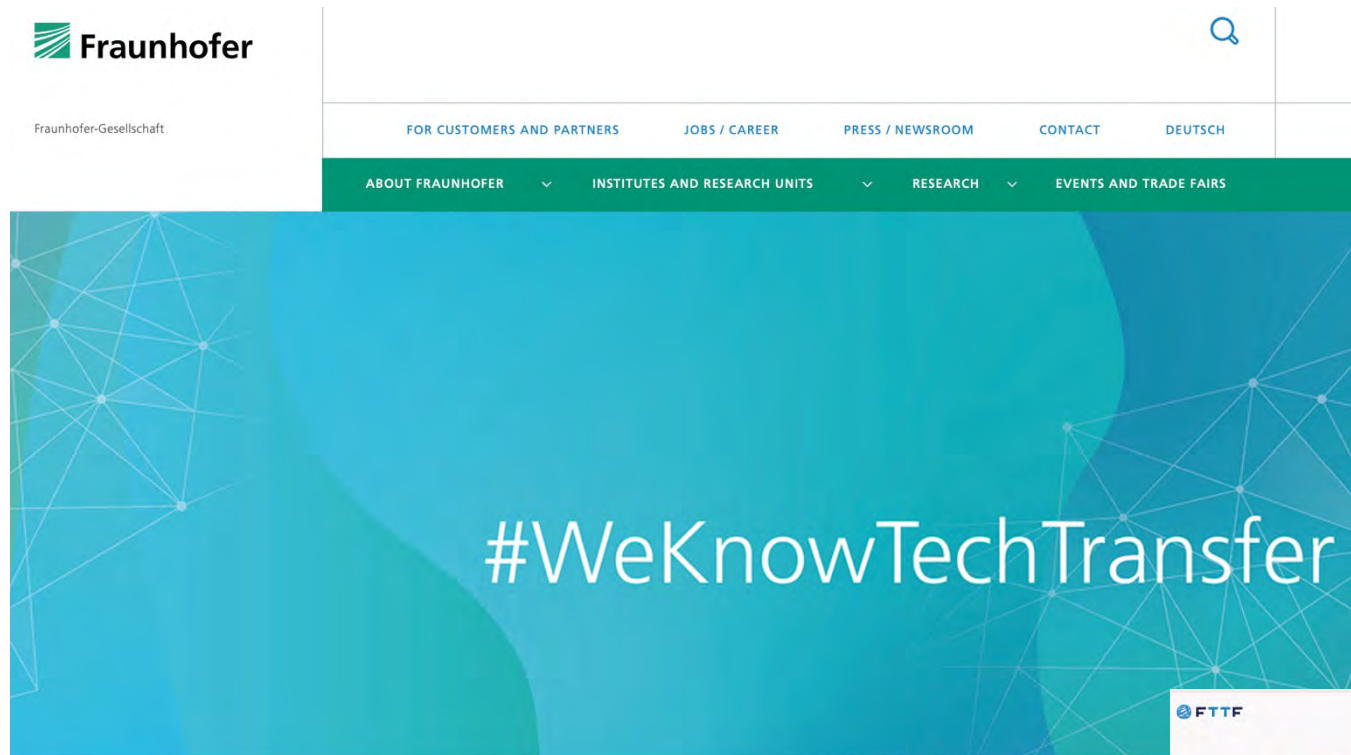
**RESEARCH**  
FRAUNHOFER STRATEGIC RESEARCH FIELDS  
Bioeconomy  
Digital Healthcare  
Artificial Intelligence (AI)  
Next Generation Computing  
Quantum Technologies  
Resource Efficiency and Climate Technologies  
Hydrogen Technologies

Homepage . For Customers and Partners

For Customers and Partners

<https://www.fraunhofer.de/en/for-customers-and-partners.html>

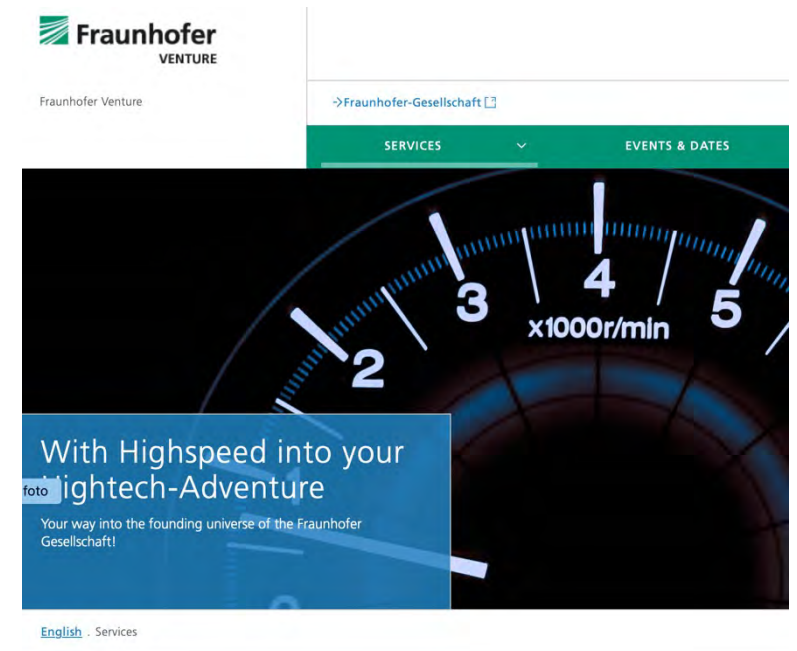
# Fraunhofer: Technology Transfer Support / Ventures / FTTF



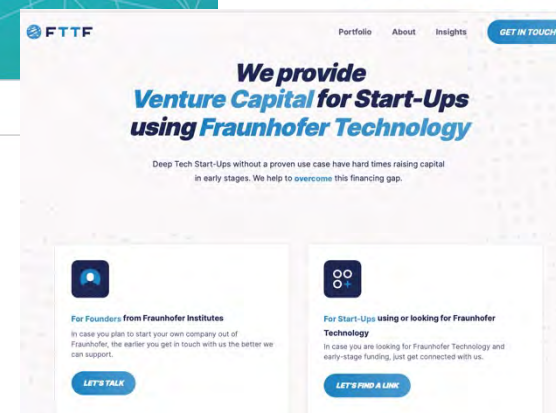
[Homepage](#) · [Research](#) · [Range of Services](#) · Technology transfer

#WeKnowTransfer – successful transfer of ideas and innovations into the economy

<https://www.fraunhofer.de/en/research/range-of-services/technology-transfer.html>



[English](#) · Services

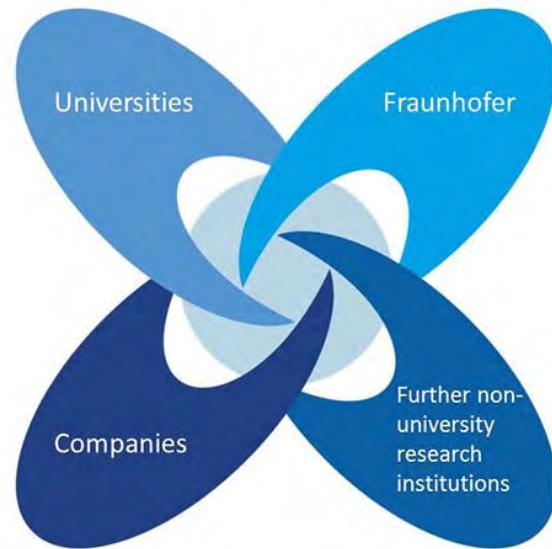


thers, companies and investors. Learn more about the possibilities at Fraunhofer Venture

**FTTF - Fraunhofer  
Technologie  
Transfer Fonds GmbH**

# Fraunhofer Technology Transfer: Living Labs

## 20 High-Performance Centers



### Mass Personalization Leistungszentrum



University of Stuttgart  
Stuttgart Partnership Initiative - Mass Personalization

### Stuttgart Partnership Initiative Mass Personalization (SPI-MP)

Excellent basic research on fabrication and biomaterial technologies for personalized biomedical systems.

## German Research Fab Microelectronics



Forschungsfabrik  
Mikroelektronik  
Deutschland

Fraunhofer Group for Microelectronics in co-operation with the Leibniz institutes IHP and FBH

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[CUSTOMER REQUESTS](#)

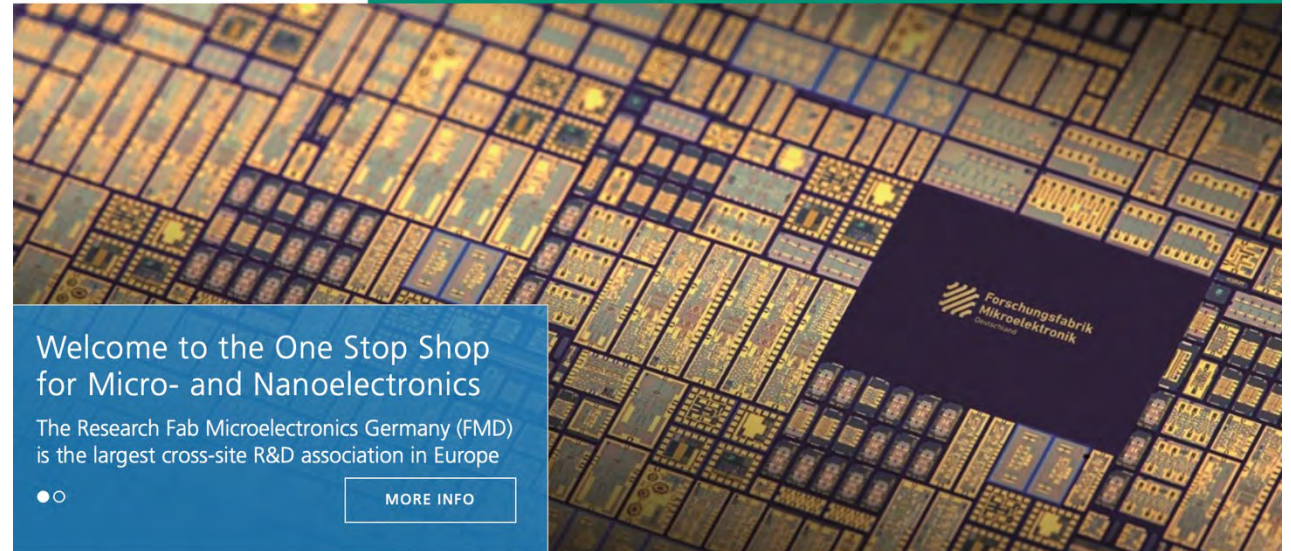
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<https://www.fraunhofer.de/en/institutes/cooperation/high-performance-centers.html>

# Fraunhofer Technology Transfer: Education

**Fraunhofer ACADEMY**

Fraunhofer Academy

CONTINUING EDUCATION

ABOUT US

## Cybersecurity Training Lab for tomorrow's security experts

Professionally trained IT security specialists are a rare commodity in Germany. So as not to fall behind in the arms race with cyber criminals, IT teams and managers must constantly hone their skills and improve their expertise in order to stay at least one step ahead. Several Fraunhofer Institutes and universities of applied sciences are now offering a modular, part-time continuing education program to alleviate the unmet demand for training opportunities.

Training and development in the field of IT security is an issue of national interest, given that cyber attacks on critical infrastructures or industrial complexes can result in significant financial losses, the disruption of vital supply networks, or the breakdown of public order. The growing trend toward connectivity and digitalization only accentuates the threat.

Course participants can specialize in the following thematic areas:

- Industrial manufacturing/Industry 4.0
- Critical infrastructures/Use cases for energy and water infrastructures
- High-security and emergency-response facilities
- Internet security and IT forensics
- Software quality/Product certification
- Embedded systems, mobile security and the internet of things

Central contact

Fraunhofer Academy  
Lernlabor Cybersicherheit

### Fraunhofer Continuing Education

© Fraunhofer Academy

[Homepage](#) · Continuing Education

#### Energy and Sustainability

Recent political developments and social trends mean that this topic is becoming more and more important for industry and the business community. Energy and sustainability is a broad...

[MORE INFO](#)

#### Logistics and Production

Take advantage of our wide range of logistics courses to keep your employees up-to-date with the very latest knowledge and expertise in this field.

[MORE INFO](#)

#### Information and Communication

Intelligent and distributed IT is the basis of modern software solutions, and reliability and intuitive usability are the key to market success. Our training programs in information and...

[MORE INFO](#)

#### Manufacturing and Testing Technology

Quality sets standards: The reliability of materials and components is also the result of high standards in staff training.

[MORE INFO](#)

#### Technology and Innovation

Companies who wish to remain successful in a competitive international environment and get to grips with the rapid pace of innovation need to ensure their employees are ready to lead.

[MORE INFO](#)

#### Life Science

Get to know topics from the life science area in an industrial context as a cross-sectional topic between natural and engineering sciences!

[MORE INFO](#)

<https://www.academy.fraunhofer.de/en/continuing-education.html>

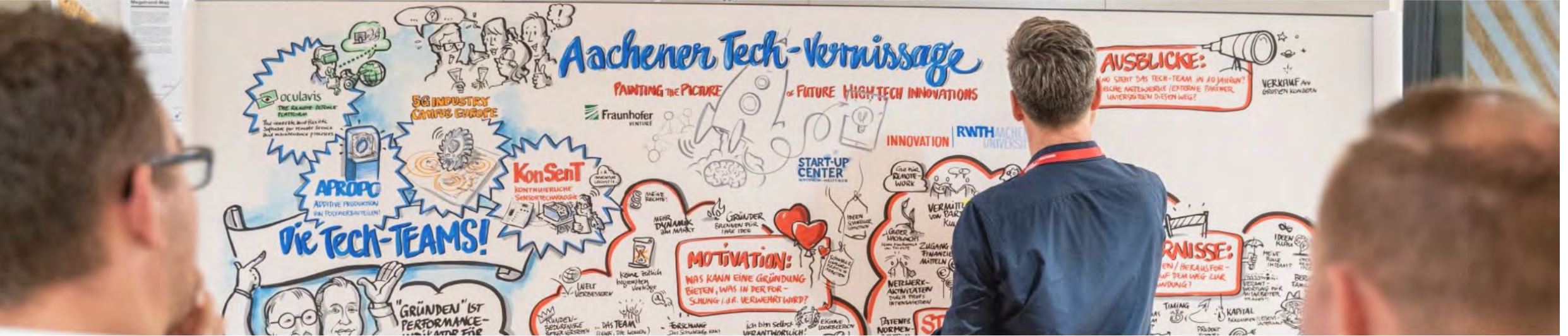
# RWTH Aachen University TT: AI Summit

The image shows a screenshot of the RWTH Aachen University website and a photograph of a presentation. The website header includes the RWTH Aachen University logo, a search bar, and navigation links for 'FACULTIES AND INSTITUTIONS', 'ACADEMICS', 'RESEARCH', and 'CORPORATE RELATIONS'. Below the header is a large banner image of a stage event at the Elysee, with a blue overlay containing the text 'Aachen AI Summit Sends Strong Signal to Berlin' and a 'MORE' button. To the right, a photograph shows a man at a podium during a presentation. A large screen behind him displays a video of Prof. Ishiguro and text: 'Japan - KI in der Industrie', 'KI WOCHE RWTH SEPTEMBER 2', and 'DR. LORENZ GRANRATH'. A blue banner in the foreground of the photo reads 'Center for Artificial Intelligence' and 'aai.rwth-aachen.de'.

26.9.: presentation  
AI in Japan

Source: RWTH Aachen webpage





INVENTED SOMETHING?



HOW TO START-UP



COOPERATION WITH RWTH



LOOKING FOR INNOVATION?



# RWTH INNOVATION

Source: RWTH Aachen webpage

At the pulse of innovation, RWTH Innovation forms the interface between research, industry and society through technology transfer.

# RWTH Aachen: 5G Industry Campus Europe



**Lighthouse project: eGo**



Photonics Cluster  
ante4C GmbH (Aachen) in partnership with the architectural office KPF Architects (New York)



Smart Logistics Cluster  
ante4C GmbH (Aachen) in partnership with the architectural office Meyer & van Schooten (Amsterdam)



Production Engineering Cluster  
IMMOFINANZ Group (Vienna) in partnership with the architectural office HENN Architekten (Munich)



Bio-Medical Engineering Cluster  
Frauenrath Group (Heinsberg) in partnership with the architectural office sop GmbH & Co. KG (Düsseldorf)

Source: RWTH Aachen webpage

# RWTH Aachen University-WZL: Consulting



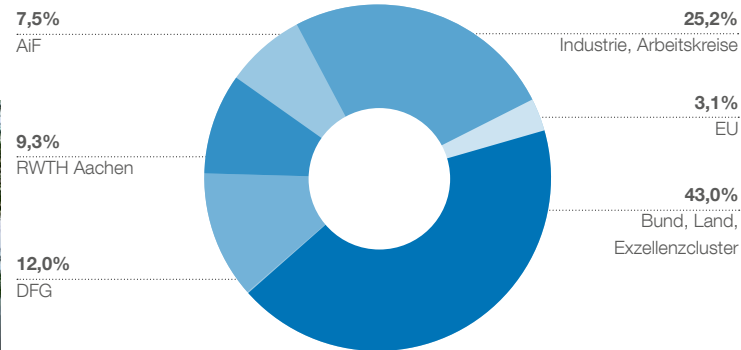
Source: RWTH Aachen webpage



Visit 9/2023



## Funding



Staff: 1.000

# RWTH Aachen: Start-ups

chirmfoto

**EXZELLENZ START-UP CENTER**  
NORDRHEIN-WESTFALEN

"It is our vision  
to build Europe's leading  
integrated tech incubator."  
@RWTH Aachen University

Check out our Incubation Program

**FROM FIRST IDEA TO START-UP**

We offer you all the support you need to help you set up your own business. Whether it is the realisation of your own idea during your studies, the spin-off of a project from work at a research institute or entry into an existing start-up - we help you make it happen.

[START-UP CONSULTING](#)

**OFFERING FOR FOUNDERS**

**OUR VISION**

Our vision is to **build the leading integrated tech-incubator in Europe** to empower talented and motivated people to build impactful technology companies. **We provide comprehensive support for founders in all stages.** With or without an innovative business

**OFFERINGS FOR FOUNDERS**

- Guidelines
- To Get Started
- Innovation Sprint
- Ideation Program
- Incubation Program
- Expert Hubs
- Co-Founder Matching
- International Entrepreneurship Office

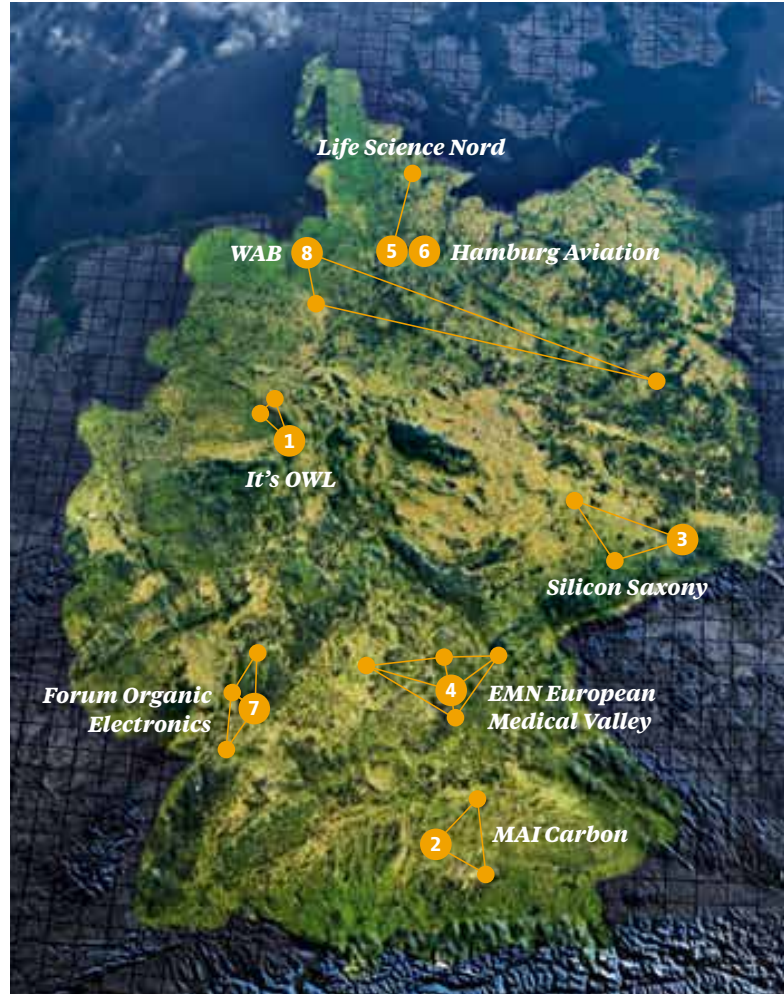
Source: RWTH Aachen webpage



Schirmfoto

**"We are Brain City Berlin!"**  
Our new Brain City Berlin video.

# Public Technology Transfer: Cluster



Source: <https://www.clusterplattform.de/>

<p><b>1</b></p> <p><b>It's OWL</b></p> <p><b>Founded:</b> 2012  <b>Location:</b> Paderborn (head office), Bielefeld, Gütersloh  <b>Members:</b> 180+, e.g. Beckhoff Automation GmbH &amp; Co. KG, Miele &amp; Cie. KG, GEA Westfalia Separator Group GmbH  <b>Research Facilities:</b> i.a. University of Bielefeld, University of Paderborn, Fraunhofer Institute  <b>Industries:</b> machinery &amp; equipment, automotive engineering, electrical &amp; electronics industry  <b>Research Focus:</b> Industrie 4.0 and intelligent technological systems</p>	<p><b>2</b></p> <p><b>MAI Carbon</b></p> <p><b>Founded:</b> 2012  <b>Location:</b> Augsburg (head office), Munich, Ingolstadt  <b>Members:</b> 120+, e.g. Audi AG, BMW AG, SGL Group  <b>Research Facilities:</b> i.a. Fraunhofer Institute, Augsburg University of Applied Sciences, Munich University of Applied Sciences  <b>Industries:</b> materials processing, automotive engineering, aerospace  <b>Research Focus:</b> carbon-fiber-reinforced plastics, lightweight design</p>	<p><b>3</b></p> <p><b>Silicon Saxony – Cool Silicon</b></p> <p><b>Founded:</b> 2000  <b>Location:</b> Dresden (head office), Leipzig, Chemnitz  <b>Members:</b> 300+, e.g. Infineon Technologies Dresden GmbH, GLOBALFOUNDRIES, X-FAB Semiconductor Foundries AG  <b>Research Facilities:</b> i.a. Dresden University of Technology, Fraunhofer Institute, Leibniz Institute for Solid State and Materials Research Dresden  <b>Industries:</b> microelectronics, information and communication technology, mobile communications  <b>Research Focus:</b> nanotechnology, smart systems</p>	<p><b>4</b></p> <p><b>EMN European Medical Valley</b></p> <p><b>Founded:</b> 2010  <b>Location:</b> Erlangen (head office), Nürnberg, Würzburg, Bayreuth, Bamberg  <b>Members:</b> 160+, e.g. Bio-Gate AG, e.Bavarian Health GmbH, medi GmbH  <b>Research Facilities:</b> i.a. Fraunhofer Institute, Friedrich-Alexander-University Erlangen-Nürnberg, TITV Greiz – The Institute for Special Textiles and Flexible Materials  <b>Industries:</b> healthcare, medical engineering  <b>Research Focus:</b> healthcare</p>
<p><b>5</b></p> <p><b>Life Science Nord</b></p> <p><b>Founded:</b> 2004  <b>Location:</b> Hamburg, Lower Saxony (head office) and Kiel, Schleswig-Holstein  <b>Members:</b> 500+, e.g. Basler AG, Beiersdorf AG, Philips GmbH, Evotech AG, Sanofi  <b>Research Facilities:</b> i.a. Kiel University, Hamburg University of Technology, Fraunhofer Institute  <b>Industries:</b> medical engineering, biotechnology, life sciences, innovative medicine  <b>Research Focus:</b> biotechnology</p>	<p><b>6</b></p> <p><b>Hamburg Aviation</b></p> <p><b>Founded:</b> 2008  <b>Location:</b> Hamburg  <b>Members:</b> 150+, e.g. Airbus Operations GmbH, Lufthansa Technik AG, Hamburg Airport, Henkel, Schenker Deutschland AG, Hutchinson Aerospace  <b>Research Facilities:</b> i.a. Hamburg University, German Aerospace Center (DLR), Hamburg Center of Aviation Training  <b>Industries:</b> aviation  <b>Research Focus:</b> aircraft construction, airift systems</p>	<p><b>7</b></p> <p><b>Forum Organic Electronics</b></p> <p><b>Founded:</b> 2008  <b>Location:</b> Heidelberg (head office), Karlsruhe, Darmstadt, Mannheim  <b>Members:</b> 30+, e.g. BASF, SAP, Merck  <b>Research Facilities:</b> i.a. Universities of Karlsruhe, Heidelberg, Darmstadt, and Mannheim, Karlsruhe Institute of Technology  <b>Industries:</b> electronics and photonics, nanotechnology, biotechnology, information and communication technology, environmental sciences  <b>Research Focus:</b> organic electronics</p>	<p><b>8</b></p> <p><b>WAB</b></p> <p><b>Founded:</b> 2002  <b>Location:</b> Bremerhaven (head office), Bremen, Berlin  <b>Members:</b> 350+, e.g. Deutsche Windtechnik AG, GE Grid GmbH, Hanseatic Power Cert GmbH  <b>Research Facilities:</b> i.a. German Aerospace Center (DLR), Fraunhofer Institute, Bremen University, Siemens  <b>Industries:</b> wind energy, maritime industries  <b>Research Focus:</b> wind energy, onshore and offshore</p>

Public: DATI  
Deutsche  
Agentur für  
Transfer und  
Innovation

### The Network

The unique forum convening public and private sector leaders for networking, intelligence and debates on research and innovation.

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### Network Updates

*These updates are republished press releases and communications from members of the Science | Business Network*

## Germany is making headway in setting up national technology transfer agency

08 Dec 2022 | News

*After some teething problems, the plans for the new agency are taking shape, with the formal launch expected early next year*

By [Fintan Burke](#)

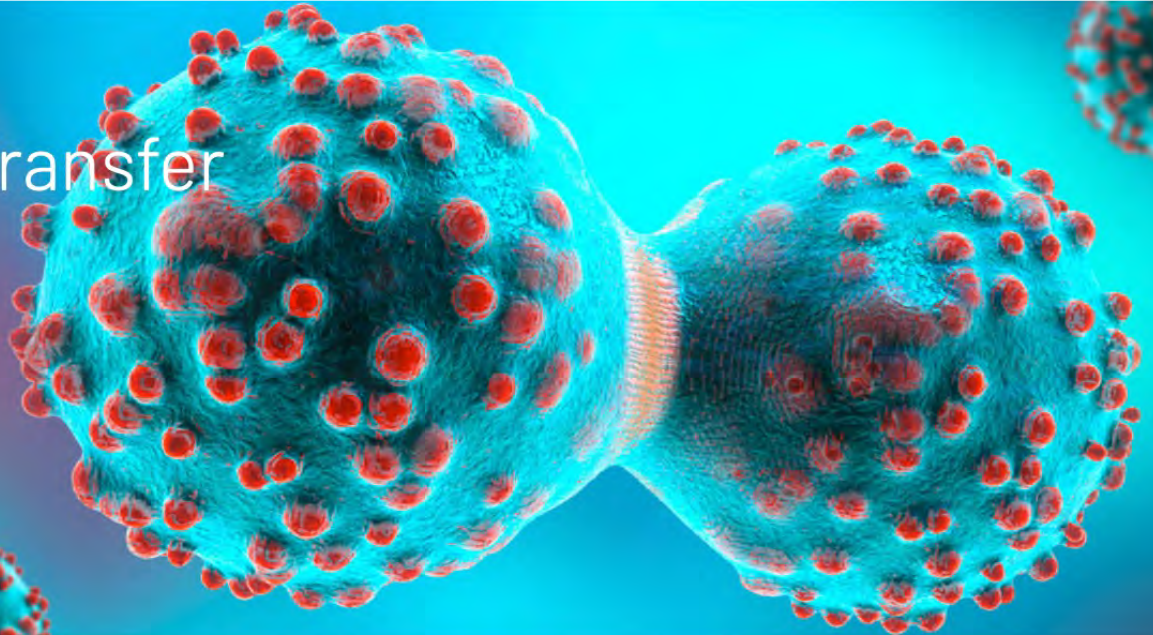


Mario Brandenburg of the Free Democratic Party in Germany is responsible for the German Agency for Transfer and Innovation. Photo: [mariobrandenburg.de](#)

=> Strengthening TT at Applied and Small/Medium Universities



Knowledge and Technology Transfer  
for Academic  
Life-Science Research



## Private TT Organisations

NEWS	INVENTORS	FOUNDERS	INDUSTRY & INVESTORS	OUR IP PORTFOLIO
01.09.2023 <b>Ascenion to support EU-</b>	Protect, develop and commercialize ideas	Taking Innovation Abroad - Technology Transfer in Germany Initiate and finance start-ups	Discover innovation opportunities	Search over 700 technologies and research



# Content

Introduction

Technology Transfer in Germany

Collaboration with Japan

# More Collaboration EU-Japan

**MoU AIST with DFKI / DLR @ CEBIT 2017**



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**EU and Japan agree to share supercomputers in groundbreaking deal**

10 Oct 2023 | News

European and Japanese scientists will fine tune their scientific models on each other's machines, hopefully boosting performance and future-proofing code. It's the latest push from Brussels to create stronger research links with 'like-minded' democracies

By David Matthews



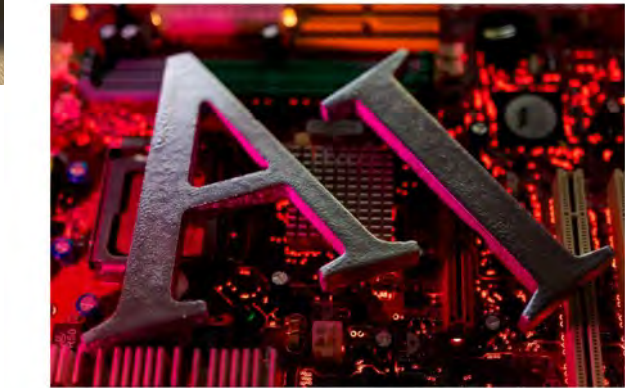
**REUTERS** World ▾ Business ▾ Markets ▾ Sustainability ▾ Legal ▾ More ▾

Technology

**EU sees 'convergence' with Japan on AI - official**

By Sam Nussey

October 10, 2023 6:07 AM GMT+9 · Updated 7 days ago



**Forbes**

FORBES › MONEY › HEDGE FUNDS & PRIVATE EQUITY

**Europe And Japan Are Leading The Race To Build AI Rules**

Mike O'Sullivan Senior Contributor - I cover the economic and financial world outside the USA, for the USA.

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Oct 14, 2023, 11:03am EDT

# Joint AI Workshops

GREAT START, FINAL  
ONE IN 2022 BUT NOW  
RESTART IN 2024!!

## 1<sup>st</sup> J-G-F AI Symposium 2019



Organized by



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## The 3<sup>rd</sup> Japanese-German-French AI Symposium – AI for Planetary Challenges in the Anthropocene –



**October 27-28, 2022**

10:00-18:00 (Japan time)

Miraikan, Tokyo

Organized by

AI Japan R&D Network

DWIH Tokyo

(German Centre for Research and Innovation Tokyo)

Embassy of France in Japan

Live stream on YouTube

(Sessions in Miraikan Hall only)

Event in English

Free lunch and coffee to all onsite participants

**Registration closed**

# Fraunhofer in Sendai Workshop, 21.11.2023



## 14<sup>th</sup> Fraunhofer in Sendai Workshop, 21.11.2023

Source: own pictures

First: 2005



# EU-Japan Digital Partnership



**Chips and Skills Roundtable with EU Commissioner Thierry Breton**

**9:30 – 11:00, 3 July 2023,**

**Delegation of the European Union to Japan  
Tokyo**



Source: own pictures



## COMMISSIONER BRETON IN JAPAN

TO DISCUSS DIGITAL PARTNERSHIP, SEMICONDUCTOR, INDUSTRIAL AND TECHNOLOGY COOPERATION

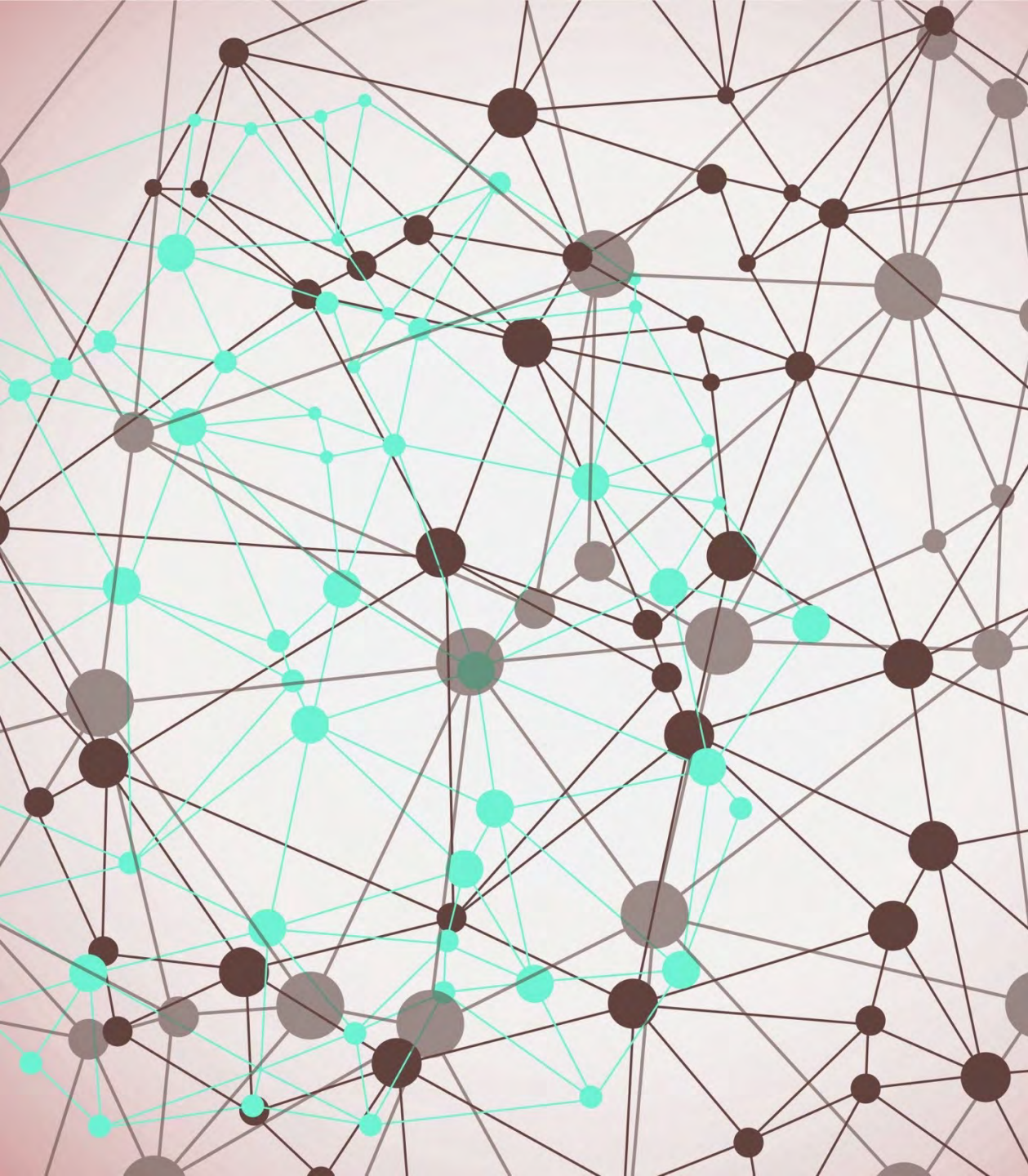


Commissioner Thierry Breton, travelled to Japan at the end of September to engage with officials and industry leaders. This was an opportunity to discuss the upcoming **European Chips Act** and develop contacts on the broader digital partnership agreement with Japan which was announced in the **EU Indo-Pacific Strategy**.

On 28 September, Commissioner Breton met the Minister for Internal Affairs and Communications, the Minister for Economy, Trade and Industry, the Minister for Digital Transformation, the Chairman of the Board of NEC, and the CEO of Fujitsu.

The following day, on 29 September, Commissioner Breton met with the CEO of Tokyo Electron (TEL), one of the major Japanese semiconductor companies, and attended a round table discussion with 15 European and Japanese business representatives,

Roundtable in July on the occasion of Commissioner Breton's visit to Japan for the Digital Partnership



# THANK YOU VERY MUCH