Research in Baden-Württemberg

Research Landscapes and Technology Transfer in Australia and Baden-Württemberg. Current Projects and Perspectives for Research Collaboration

25th November 2016
Stuttgart
Welcome to Baden-Württemberg!

Diversity

Beautiful landscapes, culinary delicacies and cultural attractions spread out over an area of 35,751 km²

Home to people from all over the world

10.7 million people from more than 188 different countries live in Baden-Württemberg. Around 12 per cent of our citizens come from abroad.
Bright-minds and world-moving inventions

- 1832 Friedrich Kammerer: Matches
- 1895 Ferdinand Graf von Zeppelin: The zeppelin
- 1886 Gottlieb Daimler: Four-wheel motorised vehicle
- 1929 Andreas Stihl: Chain saw
- 1969 Dario Fontanella: Spaghetti ice-cream
- 1995 Christiane Nüsslein-Volhard: Nobel prize in physiology/medicine
- 1884 Carl Benz: Three-wheel vehicle with petrol engine
- 1899 Ferdinand Porsche: The Lohner-Porsche electromobile
- 1887 Robert Bosch: Magneto ignition for combustion engines
- 1958 Artur Fischer: The dowel plug
- 1972 Dietmar Hopp: Software
- 2007 Dr. Gerhard Ertl: Nobel prize in chemistry

Baden-Württemberg International
Baden-Württemberg

The German Southwest:
Where ideas work
Facts and Figures about Baden-Württemberg

- Capital: Stuttgart
- Population: 10.8 Mio. (approx. 13.2% of Germany)
- Several metropolitan areas in BW
Facts and Figures about Baden-Württemberg – economic performance

- 2015 spending of the state’s GDP for R&D: 4.8% (above EU average)
- 30% of all German patents: 133 patent registrations per 100,000 inhabitants
- GDP in 2015: €460 billion, corresponding to 15.2% of Germany's GDP – higher than that of nations such as Sweden, Poland or Belgium / GDP per capita €42,725
- Highest economic growth in Germany in 2015: +3.1% (Germany: +1.7%)
- One of the lowest unemployment rate in Germany of only 3.8 per cent. Also, it has the lowest youth unemployment rate.
Strongest Economic Sectors

Mechanical Engineering
Automotive Sector
Electrical Engineering

Health Care Industry / Medical Technology
Sustainable Mobility
Environmental Technologies / Renewables
ICT and Creative Industry
Baden-Württemberg‘s companies
Baden-Württemberg – state of the German „Mittelstand“

• Baden-Württemberg has approx. 500,000 companies
• 99 % of all these companies are small and medium size. They…
  • employ less than 250 people..
  • produce 50 % of our GDP
  • offer 80 % of our apprenticeship and trainee positions for young people
Companies from abroad

[Logos of various companies]
Research in Baden-Württemberg
• Density of research possibilities

• Variety of institutions

• Outstanding quality in research and teaching
Variety of higher education and research institutions

- 9 Research Universities
- 23 Universities of Applied Sciences
- Baden-Württemberg Cooperative State University with 9 sites and 3 campuses
- 11 Universities of Arts and Music
- more than 25 Private Universities
- 2 centres belonging to the Helmholtz Association of German Research Centres (KIT, DKFZ)
- 17 institutes and subinstitutes of the Fraunhofer Society
- 13 institutes of the Baden-Württemberg Innovation Alliance
- 12 institutes of the Max Planck Society
- 7 institutes of the Leibniz Association
Ministry of Science, Research and the Arts

- Areas of responsibility: universities of the State BW, the majority of non-university research institutions, scientific libraries & archives, institutions for arts

- Theresia Bauer (Bündnis 90/Die Grünen); Minister since 2011

- Budget 2014: ca. 4,7 Mrd EUR; plus external research funds of universities (2012: around 1,1 Mrd EUR)

Baden-Württemberg Ministry of Science, Research and the Arts
WWW.MWK.BADEN-WUERTTEMBERG.DE
A new contract for funding research: “Perspektive 2020“

• BW: first Land to follow the advice of the Alliance of Scientific Organizations in Germany: rise of the core funding from 2015-2020 by 3%

• additional 2 Mrd EUR for universities

• 600 Mio EUR for the construction of universities

• 120 Mio EUR for special funding of university medical research

• 150 Mio EUR for funding of quality assurance

• 300 Mio Euro for energy costs

• Fund scheme secures sufficient core funding for up to 3,800 new positions
Strategic research topics

- Bioeconomics
- Electromobility and lightweight vehicle engineering
- Energy
- The humanities and the social sciences
- Industry 4.0
- Lightweight engineering
- Aerospace engineering
- Medicine and medical technology

www.bw-career.de/research
Research Universities

Traditional pillars of academic research in Baden-Württemberg

Periods of Foundation:

- **14th- 15th century**
  Heidelberg (1386), Freiburg (1457), Tübingen (1477)

- **Agricultural Revolution and Industrialization**
  Hohenheim (1818), Karlsruhe (1825 → Karlsruher Institut für Technologie KIT 2009), Stuttgart (1829), Mannheim (1907)

- **20th century Foundations**
  Konstanz (1966), Ulm (1967)
Research Universities

Teaching and research profile:

• Most research universities offer the full range of academic subjects

• Cutting-edge research in all academic fields

• Success in the German Excellence Initiative
The Excellence Initiative by the German Federal Government and the States’ Governments

• Competition aimed at strengthening innovation and institutional strategies

• Total funding: 4,6 € Bio. funding until 2017

• Three lines of funding
  - Graduate Schools: structured doctoral training, up to 2,5 € Mio. per year
  - Excellence Clusters: innovative, internationally visible research centres formation, up to 8 € Mio. per year
  - Institutional Strategies: strategies to promote high quality university level research
The Excellence Initiative in BW

Result of the 2012 competition:
3 of the 11 awarded Universities are in Baden-Württemberg

- University of Heidelberg
- University of Tübingen
- University of Konstanz
Universities of Applied Sciences

- Education concept strongly applies individualized teaching and small groups
- Bachelor and Master degree courses in engineering, business, IT, design or social sciences
- Very close ties to industry (Industrial experience of professors, projects for teaching & research related to the industry)
- 98% of the graduates find employment directly after graduation
Research at Universities of Applied Sciences

• Applied research towards products, processes or services with commercial use

• Research cooperation partners: enterprises, research universities, state, non-profit research institutions

• Centre for Applied Research bundling research priorities among the UAS

• UAS very successful in the field of technology transfer
Centres for Applied Research

- Center of Computational Materials Science & Engineering (HS Aalen, Fraunhofer Institute, German Cancer Research Center, HS Karlsruhe)
- Applied Biomedical Mass Spectrometry (HS Mannheim, HS Aalen, German Cancer Research Center, Heidelberg University)
- PHOTON (HS Aalen, HS Furtwangen, HS Konstanz, HS Mannheim, HS Offenburg, HS Reutlingen)
- SPANTEC-Light (HS Aalen, HS Mannheim, HS Ulm, enterprises)
- Ambient Assisted Living (HS Furtwangen, HS Ravensburg-Weingarten, HS Freiburg, University of Freiburg, FZI Research Center for Information Technology)
- Energy-efficient illumination applications (HS Ravensburg-Weingarten, HS Aalen, HS Esslingen, HS Konstanz, KIT)
Baden-Württemberg Cooperative State University (DHBW)

- Dual education at University & employer:
  6*12 weeks of academic studies;
  6*12 weeks of traineeship at employers’ institutions

- Bachelor and Master degrees in Business administration (62%) | engineering (32%) | social work (6%)

- Condition of enrollment: prospective students apply for a trainee position and sign a contract with an employers’ institution

- Success of the dual model:
  Retention rate higher than 85%
  More than 9,000 employers to choose from
Cooperative Research

• Recent institution of research funding programme by the Ministry for Science, Research and the Arts, 2011-2014

• working partner institutions to develop innovative concepts, strategies and technology
Non-University Research

• 12 Max Planck Institutes

• 17 Fraunhofer Institutes and Subinstitutes

• 3 Helmholtz Research Centres

• 7 Leibniz Institutes

• 13 Institutions of the Baden-Württemberg Innovation Alliance

• European Molecular Biology Laboratory
Partners for Innovation and Technology Transfer

- Bridges for knowledge transfer between science and industry
- Coordination, exchange, and circulation of ideas by

Institutions for Innovation and Tech Transfer:
- Regional clusters
- State Agencies for Innovation Promotion
- Innovation Alliance for Research
Partners for Technology Transfer: Regional Clusters

- Automobilhersteller
- Biotechnologie
- Pharmazie (inkl. Medizintechnik)
- Photovoltaik/Solarenergie
- Werkzeugmaschinen
- Informations- und Kommunikationsdienstleistungen
- Informations- und Kommunikationstechnik
- Medienwirtschaft
Partners for Technology Transfer: Alliances for Innovation

Institut für Mikroelektronik Stuttgart (IMS CHIPS)

Forschungszentrum Informatik Karlsruhe (FZI)

NMI Naturwissenschaftliches und Medizinisches Institut an der Universität Tübingen

Angewandte Photonik
Institut für Lasertecnologien in der Medizin und Messtechnik (ILM) an der Universität Ulm

Zentrum für Sonnenenergie- und Wasserstoff-Forschung BW (ZSW), Stuttgart/Ulm

Hahn-Schickard-Gesellschaft – Institut für Mikroaufbautechnik (HSG-IMAT), Freiburg, Stuttgart

Hahn-Schickard-Gesellschaft – Institut für Mikro- und Informationstechnik (HSG-IMIT), Villingen-Schwenningen

Hohenstein Institut für Textilinnovation e.V. (HIT), Bönnigheim

Institut für Textil- und Verfahrenstechnik (ITV) der DITF Denkendorf

Institut für Textilchemie und Chemiefasern (ITCF) der DITF Denkenorf

Zentrum für Management Research der DITF Denkendorf

Forschungsinstitut für Edelmetalle und Metallchemie (FEM), Schwäbisch Gmünd
Partners for Technology Transfer:
Agencies of the State Baden-Württemberg

Biotechnologie und Life Sciences:
BioPro Baden-Württemberg GmbH,
www.bio-pro.de

IT, Medien, Kreativwirtschaft: MFG
Medien- und Filmgesellschaft
Baden-Württemberg, www.mfg.de

Elektromobilität:
e-mobil BW,
www.e-mobilbw.de

Umwelttechnik und Ressourcenmanagement:
Umwelttechnik BW
www.umwelttechnik-bw.de

Leichtbautechnologien:
Leichtbau BW, Landesagentur
für Leichtbau,
www.leichtbau-bw.de

Baden-Württemberg International
Partners for Technology Transfer: Further Initiatives

- Around 600 „Centres of Technology Transfer“ of Steinbeis Foundation
- „Forschungscampus“: ARENA 2036 Stuttgart | M2OLIE Mannheim
- „Industry on Campus“-Modell, e.g. Boehringer Ingelheim Ulm University BioCenter (BIU)
- Institutes for Applied Sciences (IAF) at more than 20 Universities of Applied Sciences
- 8 Centres for Applied Sciences (ZAFH)
- Support Program for Technology Transfer between Universities of Applied Science and SMEs
- „Centres of Incubation“ or entrepreneurship networks at several universities
- Technological Parcs, e.g. in Karlsruhe, Tübingen-Reutlingen or Stuttgart
Funding programs
Baden-Württemberg Stipendium – Elite programme for Postdocs

• Grant for independent research project

• Maximum duration/fund: 3 years, max. 120,000 EUR

• Expenses cover research-related field trips, material, investments, and personnel (but not the post of your postdoc position)

• Call for application: once a year

www.bwstiftung.de
Baden-Württemberg Stipendium

- For local universities and their international partner institutions
- For graduate students and doctoral candidates
- Duration: 3 – 11 months
- Financial support: 500 € - 1.400 € per month

www.bw-stipendium.de
Information on aspects of relocation of academics to Baden-Württemberg

www.bw-studyguide.de
Agency for International Economic and Scientific Cooperation

Baden-Württemberg International (bw-i) is your first point of contact in Baden-Württemberg for all questions relating to internationalisation.

www.bw-i.de/en