Facts and Figures
Forschungszentrum Jülich focuses on use-inspired basic research. It faces up to the challenges of the present and pursues research for a future worth living.

As a member of the Helmholtz Association, Forschungszentrum Jülich is among the major interdisciplinary research centres in Europe.

At a Glance

5,868 employees

1.46 funding turnover at Project Management Jülich in billions of euros

82 new patent applications

40 of these applications European or international

4 new JARA Institutes

18 partnerships with graduate schools/research training groups for doctoral researchers’ qualifications

354 collaborations with industry
Title: Fascinating insights
3D image of neuronal fibre tracts in the human brain
in a 70-micrometre-thin histological frontal section
Research

Research Priorities

Forschungszentrum Jülich adopts an interdisciplinary approach and investigates relations between research areas.

Information

The increasing level of digitization both requires and enables innovations in the areas of high-performance computing, scientific simulation, and big data, as well as on future technologies such as quantum computing and neuromorphic computing. Jülich scientists also explore the coding of information in molecular-biological structures such as proteins and neural information processing in the human brain. Understanding the complex processes of the brain is crucial to a more effective diagnosis and treatment of brain diseases.

Pioneering topic of the bioeconomy

The structural change from an oil-based to a bio-based economy is a strategic pioneering topic that will gain increasing significance. This therefore requires an expansion of the sustainable bioeconomy, that is to say the investigation of new value chains based on plant raw materials.
Energy

The goal of the *Energiewende*, the transformation of the German energy sector, is to contribute to a secure, affordable, and environmentally friendly energy supply. Research focuses on renewable energies and the associated issues of conversion and storage, as well as the interactions of the energy system with the atmosphere and climate. This requires a systemic linkage of value chains, for example starting from electricity generation by photovoltaics up to and including storage and conversion back into electrical energy.

Jülich publications

2016

Total: 2,202

<table>
<thead>
<tr>
<th></th>
<th>peer-reviewed journals</th>
<th>books, other publications</th>
<th>doctoral theses, habilitations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,580</td>
<td>521</td>
<td>101</td>
</tr>
</tbody>
</table>

Forschungszentrum Jülich   Facts and Figures
Institutes and Subinstitutes

1. Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons
   - Nanoscale Systems
   - Materials Sciences
   - Structural Biology

2. Helmholtz Nanoelectronic Facility

3. Institute for Advanced Simulation
   - Jülich Supercomputing Centre
   - Quantum Theory of Materials
   - Theory of Soft Matter and Biophysics
   - Theoretical Nanoelectronics
   - Theory of the Strong Interactions
   - Computational Biomedicine
   - Theoretical Neuroscience

5. Institute of Complex Systems
   - Neutron Scattering
   - Theory of Soft Matter and Biophysics
   - Soft Matter
   - Cellular Biophysics
   - Molecular Biophysics
   - Structural Biochemistry
   - Biomechanics
   - Bioelectronics

6. Institute of Energy and Climate Research
   - Materials Synthesis and Processing
   - Microstructure and Properties of Materials
   - Electrochemical Process Engineering
   - Plasma Physics
   - Photovoltaics
   - Nuclear Waste Management and Reactor Safety
   - Stratosphere
   - Troposphere
   - Fundamental Electrochemistry
   - Systems Analysis and Technology Evaluation
   - Helmholtz Institute Erlangen-Nürnberg for Renewable Energy Production
   - Helmholtz Institute Münster for Ionics in Energy Storage

4. Institute of Bio- and Geosciences
   - Biotechnology
   - Plant Sciences
   - Agrosphere
7 Nuclear Physics Institute
- Experimental Hadron Structure
- Experimental Hadron Dynamics
- Theory of the Strong Interactions
- Large-Scale Nuclear Physics Equipment

8 Institute of Neuroscience and Medicine
- Structural and Functional Organization of the Brain
- Molecular Organization of the Brain
- Cognitive Neurology
- Physics of Medical Imaging
- Nuclear Chemistry
- Computational and Systems Neuroscience
- Brain and Behaviour
- Ethics in the Neurosciences
- Computational Biomedicine

9 Jülich Centre for Neutron Science
- Neutron Scattering
- Scattering Methods

10 Peter Grünberg Institute
- Quantum Theory of Materials
- Theoretical Nanoelectronics
- Functional Nanostructures at Surfaces
- Scattering Methods
- Microstructure Research
- Electronic Properties
- Electronic Materials
- Bioelectronics
- Semiconductor Nanoelectronics

11 Central Institute of Engineering, Electronics and Analytics
- Engineering and Technology
- Electronic Systems
- Analytics
Porntip Chiewchankaset is a doctoral researcher at King Mongkut’s University of Technology Thonburi. Both in Thailand and at Jülich’s Plant Sciences subinstitute, she researches how the productivity of cassava can be increased.
1 Biotechnology

MiBioLab
Innovation laboratory for the phenotyping of microorganisms used for industrial biotechnology products.
Volume: € 1.5 million
Funding body: Helmholtz Association

2 Energy Research

ProtOMem
Optimization of proton-conducting membranes for future sustainable energy supply
Total volume: € 1.4 million
Funding body: BMBF

3 Energy Research

NextBase
Development of industrial manufacturing processes for solar cells combining the advantages of two types of solar cells
Total volume: € 5.6 million
Funding body: EU (including Horizon 2020)

4 Energy Research

OpMaat
Development, production, and application of building-integrated photovoltaics
Total volume: € 7 million
Funding body: INTERREG Flanders – The Netherlands

5 Bioeconomy

BioSC
Funding of three FocusLabs to ensure sustainable bioeconomy in North Rhine-Westphalia
Volume: € 7 million
Funding body: MIWF

6 Biophysics

Dylon
Analysis of ion channels and transporters combined with computer simulations
Volume: € 240,000
Funding body: German Research Foundation (DFG)

7 Plant Research

P4P
Impact of breeding and biopharmaceuticals on roots and yield
Cooperation partner: Bayer AG

8 Climate Research

IAGOS-D
Expanded to include China Airlines and Hawaiian Airlines and to carry measuring instruments for recording climate-relevant trace substances in the atmosphere
Volume: € 7.2 million
Funding body: BMBF

The volumes given each represent Jülich’s share of the contract volume.
The Jülich Aachen Research Alliance, JARA for short, is a cooperation model between RWTH Aachen University and Forschungszentrum Jülich that is unique in Germany. Four new JARA institutes were founded in 2016. The aim of the two JARA-BRAIN institutes is to better understand the functions and also dysfunctions of the brain. The results will contribute to developing new treatments and reliable diagnostic methods. The main focus of the two JARA-FIT institutes is the development of environmentally friendly information technology in order to achieve large storage capacities and high computing power with a low consumption of energy and resources.

JARA: Jülich Aachen Research Alliance

Cooperation

JARA in figures

<table>
<thead>
<tr>
<th>Budget</th>
<th>in millions of euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>500</td>
</tr>
<tr>
<td>Amount invested</td>
<td>60</td>
</tr>
<tr>
<td>Funds from the Excellence Initiative(^1)</td>
<td>13.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Publications</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publications by all institutes involved in JARA(^4)</td>
<td>1,675</td>
</tr>
<tr>
<td>Joint publications</td>
<td>940</td>
</tr>
<tr>
<td>Professorial appointments</td>
<td>since 2006(^2)</td>
</tr>
<tr>
<td>Joint professorial appointments(^3)</td>
<td>61</td>
</tr>
</tbody>
</table>

\(^1\) for the period 2012–2017  
\(^2\) as of 31.12.2016  
\(^3\) excl. members of the Board of Directors  
\(^4\) peer-reviewed publications, as of 31.12.2016
## Industrial Collaborations

### Number of industrial collaborations

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>International</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>354</td>
<td>89</td>
<td>265</td>
</tr>
</tbody>
</table>

### Important industrial collaborations

**2016**

<table>
<thead>
<tr>
<th>Industrial partners</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayer CropScience</td>
<td>Project Agreement concerning Crop-Biologicals Phenotypes, P4P</td>
</tr>
<tr>
<td>MAN Turbo AG</td>
<td>Extrapolation of bond coat degradation kinetics to operationally relevant temperatures</td>
</tr>
<tr>
<td>TenneT TSO GmbH</td>
<td>Compiling tender documents for the project on technical data processing</td>
</tr>
<tr>
<td>Siemens AG</td>
<td>Computing time on the JURECA cluster system</td>
</tr>
<tr>
<td>Siemens Power Generation</td>
<td>Modelling of damage to coated metallic turbine components</td>
</tr>
<tr>
<td>Safran Tech</td>
<td>Burner rig testing of PVD-TBCs w/wo CMAS loading</td>
</tr>
<tr>
<td>Nanotechnology Solar GmbH</td>
<td>Development of optically active layers for photovoltaics</td>
</tr>
<tr>
<td>Rolls-Royce Germany</td>
<td>Life cycle tests</td>
</tr>
<tr>
<td>Siemens AG</td>
<td>Elastic modulus characterization</td>
</tr>
</tbody>
</table>
Patents and Licences

Jülich research focuses on basic topics and creates innovations which benefit both industry and society and which lead to protective rights and licensing agreements.

Protective rights include inventions for which patent applications have been filed (patent applications) as well as patents granted.

New patent applications

2016

- 37 international PCT applications
- Total 82
- 3 European patent applications
- 42 German patent applications

Patents granted

2016

- 34 other foreign patents
- Total 157
- 10 German patents
- 113 national patents from 15 European patent-granting procedures

455 patent families in 2016
15,061 protective rights in 2016

Total number of licences: 86

- 7 of which new
- 26 from abroad (13 of which from USA)
- 65 from SMEs

Revenues from licensing and know-how agreements: €321,000
Promoting Young Talent: juelich_horizons

Supporting young people and early-career scientists is one of Forschungszentrum Jülich’s central concerns. Introducing children and teenagers to research, developing innovative structures for vocational training, and providing early-career scientists with outstanding conditions for achieving excellence – these tasks have been brought together under the banner of juelich_horizons.

1. **juelich_impulse**
   is aimed at children and young people, starting with kindergarten children and covering all types of schools; a central element here is the JuLab Schools Laboratory.

2. **juelich_tracks**
   targets young people during their training and early career stages.

3. **juelich_chances**
   offers university students and postgraduates from Germany and abroad the opportunity to work in an excellent research environment.

4. **juelich_heads**
   aims to attract excellent early-career scientists with stimulating research conditions and interesting career prospects.

**People**
A total of 4,342 visitors took part in JuLab events in 2016, including 3,692 school students during days of experiments for entire school classes. 136 participated in holiday activities or parent and child days, and 444 were here for special events including Helmholtz Day and Brain Research Day. Among the highlights of 2016 was Little Scientists’ Day, which was hosted in cooperation with the Equal Opportunities Bureau. Around 80 employees of Forschungszentrum Jülich visited their children’s kindergartens and performed experiments together with the boys and girls.

In 2016, 100 trainees celebrated the successful completion of their courses. Seventeen of the trainees passed their final examinations with the grade “very good” and 58 with “good”. The trainees preparing to become industrial mechanics also earned an additional qualification, termed “Euregio competence”, which is a language certificate for Dutch.

### Vocational training places

<table>
<thead>
<tr>
<th>Occupations</th>
<th>new trainees 2016</th>
<th>those including a dual study programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory technicians</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Electricians</td>
<td>11</td>
<td>–</td>
</tr>
<tr>
<td>Metalworkers</td>
<td>10</td>
<td>–</td>
</tr>
<tr>
<td>Office staff</td>
<td>11</td>
<td>–</td>
</tr>
<tr>
<td>Mathematical-technical software developers</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>–</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>
Forschungszentrum Jülich is rich in opportunities for students and doctoral researchers from Germany and abroad who want to start out on their career in science. A total of 358 female and 608 male doctoral researchers were supervised at Jülich in 2016. Of that total, 393 came from abroad – from 59 different countries. At a special ceremony, 39 doctoral researchers received their certificates and three of them were awarded Jülich’s Excellence Prize.

Winners of the Jülich Excellence Prize 2016: Sarah Finkeldei, Stephan Wirths (on the left), and Sergeii Pud.

Heading a young investigators group offers scientists early independence and superb career opportunities. Forschungszentrum Jülich also participates in the Helmholtz Postdoc Programme. Funding for up to three years enables young scientists to enhance their own research profile directly after their doctorate.

Young investigators groups at Jülich
Young investigators groups funded by the Helmholtz Association, Forschungszentrum Jülich, and third parties, 2012–2016

Doctoral researchers and postdocs learned about possible career pathways at Jülich’s first Career Day.
People

Personnel

Proportion of women

<table>
<thead>
<tr>
<th>Year</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>32.6</td>
<td>67.4</td>
<td>100.0</td>
</tr>
<tr>
<td>2016</td>
<td>37.1</td>
<td>62.9</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Overview personnel


<table>
<thead>
<tr>
<th>Area</th>
<th>Number of employees¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientists and technical personnel</td>
<td>3,661</td>
</tr>
<tr>
<td>of which scientists incl. persons in scientific training</td>
<td>2,114</td>
</tr>
<tr>
<td>• of which doctoral researchers</td>
<td>537</td>
</tr>
<tr>
<td>• of which scholarship holders</td>
<td>16</td>
</tr>
<tr>
<td>• of which student assistants</td>
<td>121</td>
</tr>
<tr>
<td>• of which joint appointments with universities²</td>
<td>135</td>
</tr>
<tr>
<td>• of which W3 professors</td>
<td>57</td>
</tr>
<tr>
<td>• of which W2 professors</td>
<td>62</td>
</tr>
<tr>
<td>• of which W1 professors</td>
<td>16</td>
</tr>
<tr>
<td>of which technical personnel</td>
<td>1,547</td>
</tr>
<tr>
<td>Project management organizations</td>
<td>1,162</td>
</tr>
<tr>
<td>Administration</td>
<td>714</td>
</tr>
<tr>
<td>Trainees and students on placement</td>
<td>331</td>
</tr>
<tr>
<td>Total</td>
<td>5,868</td>
</tr>
</tbody>
</table>

¹) only employees with a contract paid by Jülich are included
²) excl. members of the Board of Directors

Visiting scientists

2016: a total of 867 from 65 countries
(broken down in percentage terms)

<table>
<thead>
<tr>
<th>Region</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>53</td>
</tr>
<tr>
<td>Asia</td>
<td>23</td>
</tr>
<tr>
<td>Western Europe¹</td>
<td>14</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>5</td>
</tr>
<tr>
<td>America</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
</tr>
</tbody>
</table>

¹) without Germany
Professorial Appointments

Scientists working at Jülich are appointed professor in a joint procedure with a partner university. In accordance with the Jülich model, those who are appointed professor are simultaneously seconded by the university to work at Forschungszentrum Jülich.

In the reverse Jülich model, professors whose primary employment is at their university also work at Jülich (secondary employment). There are 61 joint appointments with JARA alone.

Joint professorial appointments with universities*

As of: 2016

<table>
<thead>
<tr>
<th>University</th>
<th>Jülich model total</th>
<th>of which new appointments in 2016</th>
<th>Reverse model total</th>
<th>of which new appointments in 2016</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aachen University of Applied Sciences</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>HHU Düsseldorf</td>
<td>11</td>
<td>2</td>
<td>7</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>RWTH Aachen University</td>
<td>47</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>61</td>
</tr>
<tr>
<td>Univ. of Bochum</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Univ. of Bonn</td>
<td>10</td>
<td>3</td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Univ. of Duisburg Essen</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Univ. Erlangen-Nürnberg</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Univ. of Cologne</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Univ. of Leuven</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Univ. of Louvain</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Univ. of Münster</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Univ. of Regensburg</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Univ. of Stuttgart</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Univ. of Wuppertal</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>8</strong></td>
<td><strong>18</strong></td>
<td><strong>6</strong></td>
<td><strong>135</strong></td>
</tr>
</tbody>
</table>

* excl. members of the Board of Directors
Excellent Platforms

Forschungszentrum Jülich promotes simulation and data sciences as a key method for research and makes use of large, in many cases unique, scientific infrastructures.

Jülich Centre for Neutron Science (JCNS)

JCNS operates neutron research instruments at the four leading international neutron sources. It is responsible for the development and operation of the eleven Jülich instruments at Heinz Maier-Leibnitz Zentrum (MLZ) in Garching near Munich, Institut Laue-Langevin (ILL) in Grenoble, France, and at the Spallation Neutron Source (SNS) in Oak Ridge, USA. These instruments are also available to external scientists. In addition, JCNS is developing several instruments together with international partners for the future European Spallation Source in Lund, Sweden.

Beam time allocated
in days, rounded, 2016

<table>
<thead>
<tr>
<th>Category</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training activities</td>
<td>52</td>
</tr>
<tr>
<td>Maintenance/development</td>
<td>92</td>
</tr>
<tr>
<td>Internal users</td>
<td>232</td>
</tr>
<tr>
<td>Total</td>
<td>1,359</td>
</tr>
</tbody>
</table>

983 allocated through review processes, of which:
- 514 users from Germany
- 252 users from the EU
- 217 users from the rest of the world
Helmholtz Nanoelectronic Facility (HNF)

The Helmholtz Nanoelectronic Facility at Forschungszentrum Jülich is the Helmholtz Association’s central technology platform for nanostructures. It serves to investigate, manufacture, and characterize nanostructures for information technology. HNF, which was transformed into an independent organizational unit in early 2017, opens up free access for universities, research institutions, and industry to know-how and offers resources for the fabrication of structures, devices, and circuits as well as complex systems. The primary focus of its research is resource-conserving Green IT.

HNF in figures
2016

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal users</td>
<td>211</td>
</tr>
<tr>
<td>External users</td>
<td>44</td>
</tr>
<tr>
<td>Usage days</td>
<td>220</td>
</tr>
<tr>
<td>Maintenance days</td>
<td>35</td>
</tr>
<tr>
<td>Total usage time of all</td>
<td>41,129</td>
</tr>
<tr>
<td>instruments in hours</td>
<td></td>
</tr>
<tr>
<td>External visitors</td>
<td>1,582</td>
</tr>
</tbody>
</table>

The Helmholtz Nanoelectronic Facility: one of the largest state-of-the-art clean-room centres in Europe
Ernst Ruska-Centre (ER-C)

Forschungszentrum Jülich and RWTH Aachen University jointly operate ER-C as a centre for atomic-resolution microscopy and spectroscopy with electrons. It is simultaneously the first national user centre for ultrahigh-resolution electron microscopy. It was transformed into an independent organizational unit in early 2017. The joint undertaking on the Jülich campus, which is named after the inventor of the electron microscope, offers scientists a unique insight into the world of atoms and develops new methods for materials research. Around 50% of the measurement time on the five Titan microscopes (CREWLEY, HOLO, PICO, STEM, and TEM) at ER-C is made available to universities, research institutions, and industry. This time is allocated by a panel of experts nominated by the German Research Foundation (DFG).

Allocated measurement time
on the electron microscopy instruments of ER-C\(^1\) in days, 2016

- **184** servicing and maintenance
- **215** RWTH Aachen University
- **549** Forschungszentrum Jülich
- **603** external users
- **Total 1,551**

Users
according to region, percentage, 2016

- **Europe** 36
- **Rest of world** 32
- **NRW** 16
- **Germany\(^1\)** 16

1) excl. NRW

The electron microscope PICO, with its record resolution of 50 billionths of a millimetre, can image tiny structures right down to displacements of individual atoms.
Jülich Supercomputing Centre (JSC)

The Jülich Supercomputing Centre provides scientists and engineers working at Forschungszentrum Jülich, universities, and research institutions in Germany and throughout Europe, as well as in the commercial sector, with access to computing capacity on supercomputers, enabling them to solve highly complex problems using simulations. The John von Neumann Institute for Computing is responsible for the scientific evaluation of projects.

Forschungszentrum Jülich operates JUQUEEN as part of the Supercomputing research programme of the Helmholtz Association. Approximately 70% of the computer is part of the national Gauss Centre for Supercomputing (GCS), which means that this part of the computation time is allocated to national and European projects through a well-established peer-review process. The remaining 30% of computing time is reserved for users at Forschungszentrum Jülich and the Jülich Aachen Research Alliance (JARA). Since the beginning of 2017, JSC together with five other Helmholtz centres has been developing a new infrastructure for the permanent, safe, and readily usable storage of research data within the scope of the Helmholtz Data Federation.

Relative numbers of users
percentage, 2016

1 NIC international

49 NIC national

50 NIC Forschungszentrum Jülich

29 NIC Forschungszentrum Jülich

71 NIC GCS and Prace Tier-0

1) From 2016 onwards, computation time for Jülich simulation-science students (JuSiSc) has been allocated by Jülich due to the restructuring of GRS. The figures are based on the GCS computing time periods Nov. 2015 to Oct. 2016 and May 2016 to April 2017.
At Jülich, possible courses of action are being researched and developed in order to ensure equally good living conditions for current and future generations. At the same time, the work being conducted at Forschungszentrum Jülich should itself also satisfy sustainability criteria.

In 2017, Forschungszentrum Jülich published the second Sustainability Report showing how Jülich is becoming even more sustainable.

http://www.fz-juelich.de/portal/EN/AboutUs/DevelopmentOfJuelich/sustainable-campus/_node.html

Forschungszentrum Jülich’s app
apps.appmachine.com/7492GG
Work at Other Locations

Forschungszentrum Jülich is represented at other locations as follows:

1. **Excellent cooperation with Aachen**
   Forschungszentrum Jülich is linked to RWTH Aachen University via the Jülich Aachen Research Alliance (JARA). In this unique form of cooperation, the partners overcome the juxtaposition of university and non-university research and teaching.

2. **Global experiments with neutrons**
   The Jülich Centre for Neutron Science (JCNS) operates instruments at the world’s leading neutron sources:

   - at the Heinz Maier-Leibnitz Zentrum in Garching near Munich together with Technische Universität München, and Helmholtz-Zentrum Geesthacht;

   - at the Spallation Neutron Source (SNS) in Oak Ridge, USA, in which JCNS is involved as the only non-American institution;

   - at the high-flux reactor at Institut Laue-Langevin (ILL) in Grenoble, France; Jülich is a joint shareholder, together with the French organizations CEA and CNRS; this guarantees the participation of the entire German neutron research community in the operation of the most powerful neutron source in the world;

   - in Lund, Sweden, Jülich coordinates the German contribution to the planned European Spallation Source (ESS). The aim is to establish a German branch office.

3. **Synchrotron experiments in Germany and abroad**
   - The Peter Grünberg Institute, through the Jülich Synchrotron Radiation Laboratory (JSRL), coordinates experiments in Dortmund, Berlin, Trieste (Italy), and Argonne (USA).

4. **Project Management Jülich**
   is a largely independent organization with branch offices in Jülich, Berlin, Rostock, and Bonn.

5. **Biotechnology cluster BIO.NRW**
   Jülich’s Düsseldorf branch office of BIO.NRW, a cluster funded by the Ministry of Innovation, Science
and Research of the State of North Rhine-Westphalia, focuses on initiating cooperations between research, enterprises, investors, and politics.

6 Internationally represented
- The activities of Forschungszentrum Jülich in India are coordinated by an office in New Delhi;

- as a member of the Helmholtz Association (HGF), Forschungszentrum Jülich is also represented internationally by Helmholtz offices in Brussels, Moscow, and Beijing.

7 Helmholtz Institutes
- The Helmholtz Institute Erlangen-Nürnberg (HI ERN) is a branch office of Forschungszentrum Jülich for investigating renewable energies and is operated in cooperation with Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) and Helmholtz-Zentrum Berlin (HZB);

- the Helmholtz institute Ionics in Energy Storage was established in Münster as a branch office of Forschungszentrum Jülich and pools Jülich’s competences in battery research with those of RWTH Aachen University.

8 Jülich’s Institute of Neuroscience and Medicine is now responsible for all the organizational and funding aspects of the Bernstein Network Coordination Site (BCOS) at the University of Freiburg.

9 One subinstitute of Jülich’s Institute of Complex Systems, together with other research units from nine partner institutions, forms the Centre for Structural Systems Biology (CSSB) in Hamburg, with the aim of decoding the molecular mechanisms of diseases.
Revenues

In 2016, Forschungszentrum Jülich’s third-party funding totalled €247.2 million. Most of this income resulted from research and development activities for industry, the acquisition of funding from Germany and abroad, and project management on behalf of the Federal Republic of Germany and the federal state of North Rhine-Westphalia.

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