

Welcome



HELMHOLTZ
FROM DATA TO
KNOWLEDGE

Dr. Elena Eremenko, The Helmholtz Association, Moscow
Инструменты поддержки научных коллабораций международного уровня

German House of Research and Innovation (DWIH)



DAAD

 **Fraunhofer**



Deutsches Wissenschafts- und
Innovationshaus – Moskau

Deutschland
Land der Ideen

 **HELMHOLTZ**
| ASSOCIATION

SIEMENS



Alexander von Humboldt
Stiftung/Foundation



DFG

Ministerium für Innovation,
Wissenschaft und Forschung
des Landes Nordrhein-Westfalen




LEG
Thüringen
Thüringen International


Deutsches
Historisches
Institut
Moskau

 **AHK**
Deutsch-Russische
Auslandshandelskammer
Российско-Германская
внешнеторговая палата



Niedersachsen



 **Deutsche Messe**

knauf

<http://www.dwihs.ru>


Leibniz
Gemeinschaft


MAX-PLANCK-GESELLSCHAFT

 **HELMHOLTZ**
| ASSOCIATION

DWIH: Cooperation – Networking – Co-financing



Science Lectures

Science Talks



Workshops



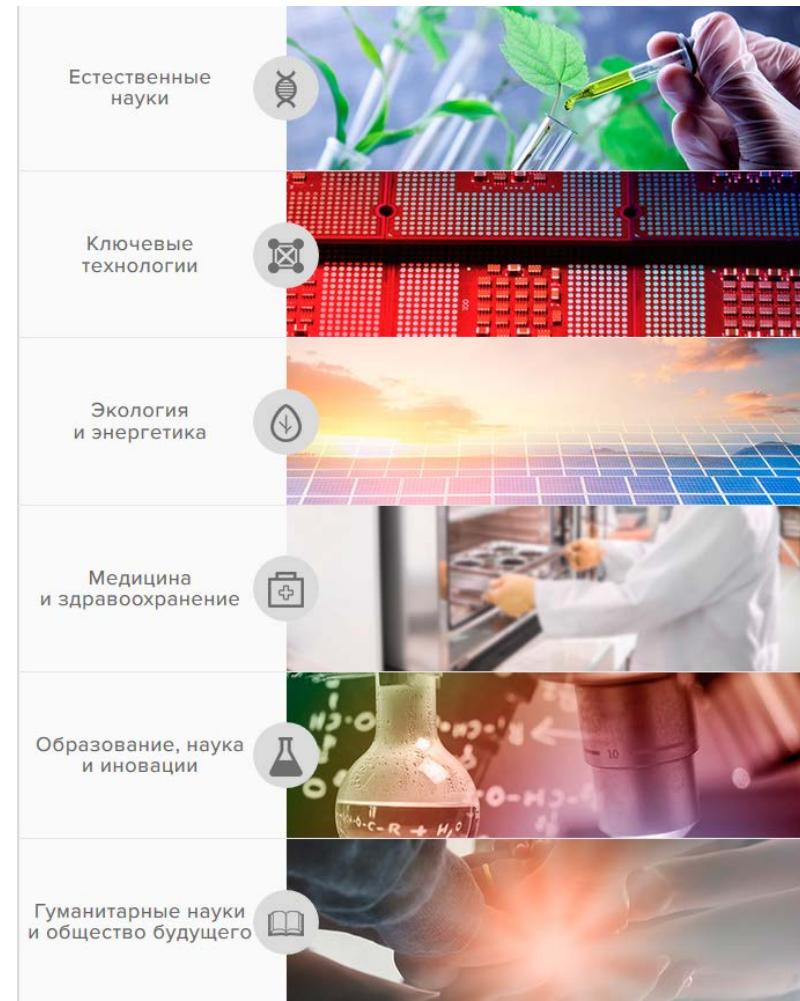
Conferences

Exhibitions



German-Russian Week of the young researcher

<http://www.dwih.ru>





German Research Organisations

Status 2015

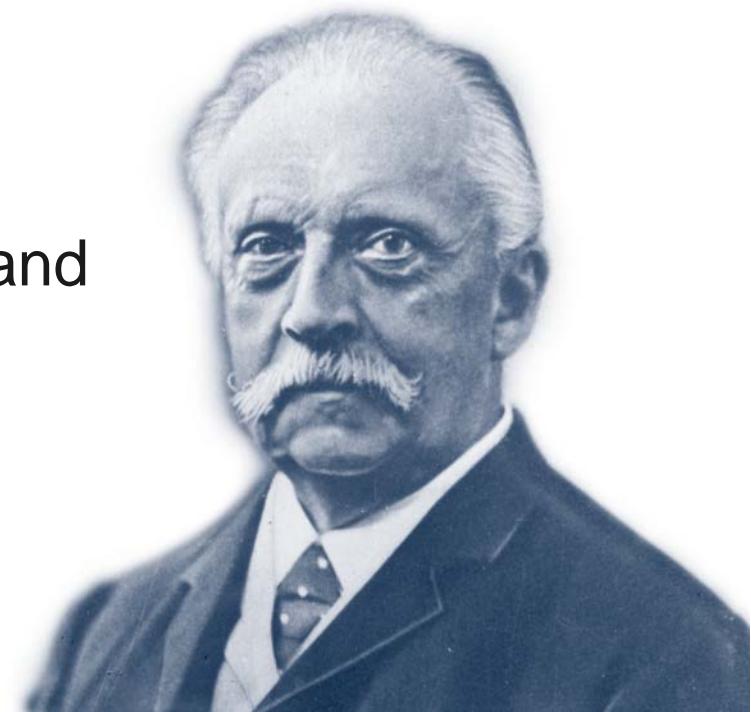
| | Budget/ Billion € | Staff in FTE* | Centres/ Institutes |
|--|----------------------|------------------|------------------------|
| Helmholtz Association Use-inspired basic research in strategic programmes | 4.45 | 38,237 | 18 |
| Max Planck Society Pure basic research | 1.80 | 13,632 | 82 |
| Fraunhofer Society Industry-oriented research and development | 2.00 | 17,119 | 66 |
| Leibniz Association Long-term research topics | 1.43 | 14,229 | 86 |

Source: GWK Monitoring Report 2015 Joint Initiative for Innovation and Research

*Staff in working hours (full-time equivalent) for 2014

Helmholtz Research Mission & Strategy

- Systems solutions for grand challenges based on:
 - Scientific excellence
 - Interdisciplinarity and critical mass
 - long term research programs
- Helmholtz provides a highly attractive environment for talents and brilliant brains
- Profound expertise in large scale research infrastructure



Helmholtz Centers

GEOMAR Helmholtz Centre for Ocean Research Kiel

Deutsches Elektronen-Synchrotron (DESY)

Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI)

German Aerospace Center (DLR)

Forschungszentrum Jülich (FZJ)

German Center for Neurodegenerative Diseases (DZNE)

GSI Helmholtz Centre for Heavy Ion Research

German Cancer Research Center (DKFZ)

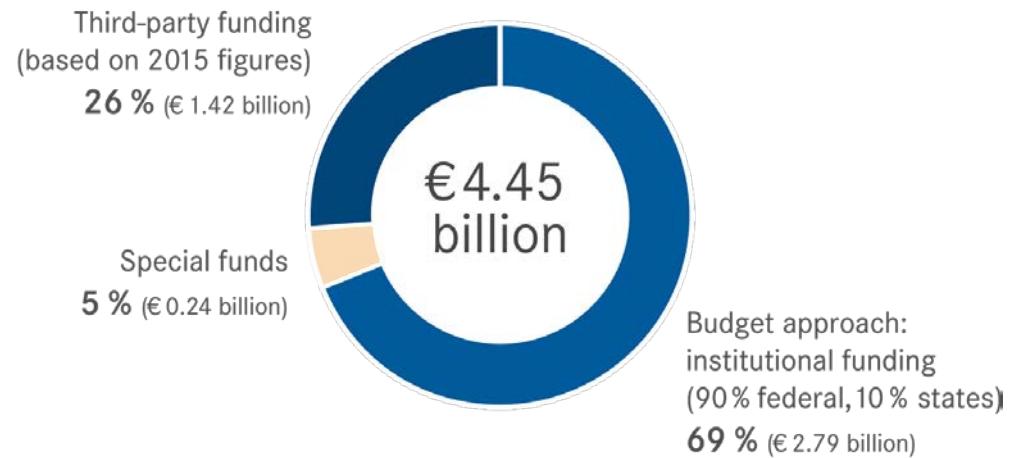
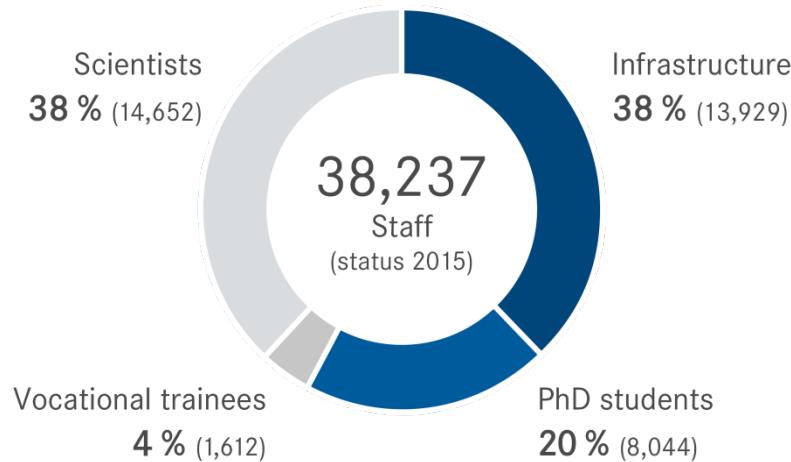
Karlsruhe Institute of Technology (KIT)

Research fields:

- Energy
- Earth and Environment
- Health
- Aeronautics, Space and Transport
- Matter
- Key Technologies



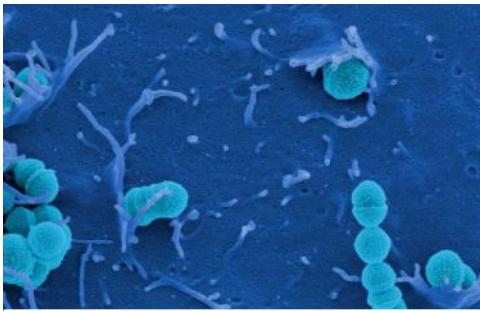
Facts and Figures



Research Portfolio of the Helmholtz Association



ENERGY



HEALTH



MATTER



EARTH AND
ENVIRONMENT



AERONAUTICS,
SPACE AND
TRANSPORT



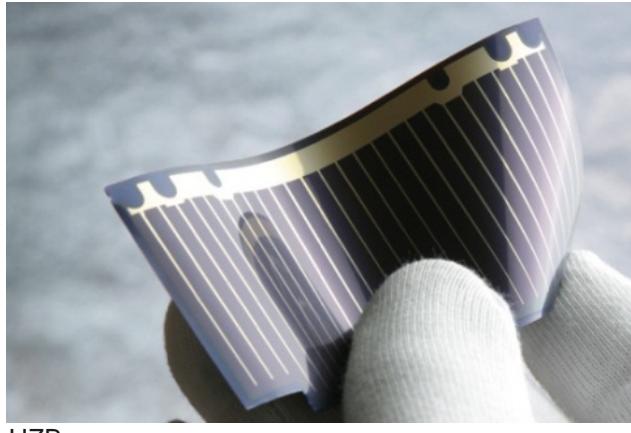
KEY TECHNOLOGIES

A wide-angle photograph of a massive solar farm. In the foreground, numerous blue solar panels are arranged in long rows, supported by a complex white steel truss structure. The panels reflect the bright sunlight. In the background, a range of brown and green mountains under a clear blue sky provides a scenic backdrop.

Research Field
ENERGY

Energy

Research Field



HZB

- Novel technologies/materials for energy storage and smart grids
- Systems Integration
- Nuclear Fusion
- NUSAFFE & Disposal issues



BIOLIQ/ KIT

R&D along the entire value chain: from fundamental research to the market area
Holistic approach to advance the transition of the energy system



Research Field
**EARTH AND
ENVIRONMENT**

Earth and Environment Research Field



Polarstern/AWI



HALO/DLR

- Polar research (research vessel Polarstern, antarctic Neumayer station)
- Marine and coastal research
- Geosciences, terrestrial environment
- Earth observation with satellites (Tsunami early warning system)
- Exploring atmospheric changes with the HALO aircraft
- Modelling the system earth

A scanning electron micrograph (SEM) showing a dense population of cyanobacteria. The organisms are primarily cyan-colored, appearing as small, rounded cells and larger, branching filamentous structures. They are distributed across a dark, granular background, likely representing soil or water particles.

Research Field
HEALTH



Health Research Field



Helmholtz Cohort/MDC



Drug research, Helmholtz Institute for
Pharmaceutical Research Saarland (HIPS)/HZI

- Basic research on disease mechanisms
- Unravel complex systems
- Translational research
- Focus on major diseases
- Grand challenges:
 - Preventive medicine
 - Personalized medicine
 - Proof of concept
 - E-Health & Big data

A photograph taken from inside a spacecraft, showing an astronaut in a blue shirt looking out through a large circular hatch. The view outside is of Earth with white clouds against a blue sky. The interior of the spacecraft is dark with various equipment and cables visible.

Research Field
**AERONAUTICS,
SPACE AND
TRANSPORT**

Aeronautics, Space and Transport

Research Field



EnMap/DLR



TerraSAR-X-Image of Gabon/DLR

- Understanding climate change via earth observation technologies
- Investigation of the physics and chemistry of the global atmosphere
- Future technologies for mobility, communication and security



Research Field
MATTER



Matter Research Field



FLASH/DESY



HADES Detector/GSI

- European XFEL:
powerful light source
- Pilot plant FLASH (for VUV-X-rays)
- PETRA III:
Most brilliant synchrotron radiation source in the world
- FAIR: anti-proton and ion research
- Prime partner for LHC at CERN:
elementary particle physics
- Exotic nuclei (isotopes of Bk, Np, Am)



Research Field
**KEY
TECHNOLOGIES**

Key Technologies

Research Field



JUQUEEN/Forschungszentrum Jülich

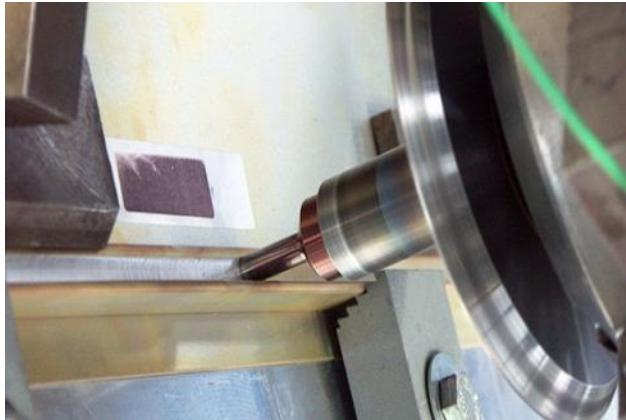


Forschungszentrum Jülich

- **Information Technology**
 - Supercomputer (JUQUEEN/JUROPA)
 - Nanotechnology
 - Big data analytics
- **Materials Science**
 - Nanoelectronics
 - Lightweight Materials
- **Life Science**
 - Bioeconomy
 - Simulating the human brain
 - Regenerative Medicine

Key Technologies

Research Field



HZG



Forschungszentrum Jülich

Application-oriented basic research, technology development, cutting edge large-scale research infrastructures

- **Information Technology, Big Data**
 - Big Data, Data Analytics, HPC, Green & Secure IT, Quantum Information, Neurotechnology
- **Materials Science**
 - Implant Materials, Novel Ultra-Lightweight Materials, Innovative Process Technologies, Polymer Research

Helmholtz as a prime strategic partner



Karlsruhe Institute of Technology



Helmholtz Zentrum München

- **550** professorships with universities
- Portfolio of strategic cooperations:
 - **15** Helmholtz Alliances (**+5** in Energy)
 - **7** Helmholtz Institutes
 - **110** Virtual Institutes
 - **200** Helmholtz Young Investigator Groups
- German Centers of Health Research
- Partner in the German excellence initiative:

Helmholtz as a prime strategic partner



Karlsruhe Institute of Technology

- KIT:
Merger of a University and
a Helmholtz research center
- JARA:
Jülich Aachen Research Alliance
- Berlin Institute of Health
- NCT Heidelberg & Dresden
- Innovative PPP alliances



Helmholtz Zentrum München

Technology Transfer @Helmholtz

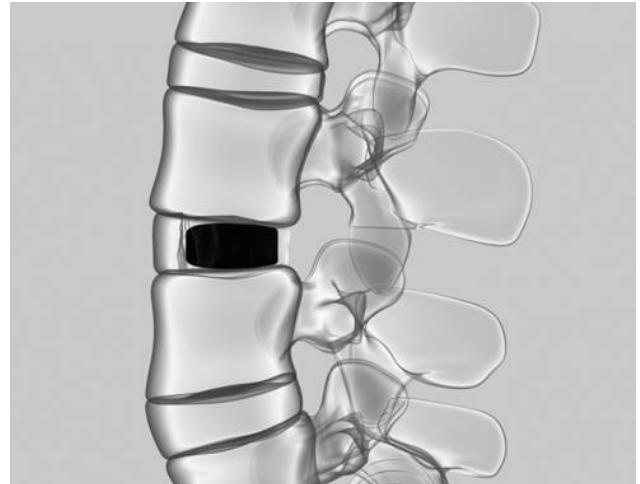


Low emission cement/KIT

- **139** spin-offs between 2005 and 2015 (e.g. Celitement GmbH, Karlsruhe)
- **2,000** collaborative projects with industry p.a. with revenues of app. **€150 M** p.a.
- **1,400** licencing agreements generate between **€12 M** and **€22 M** income in the last years
- Portfolio of **12.500** IP rights (over a third licensed)
- **400** new patents filed per year

Technology Transfer @Helmholtz

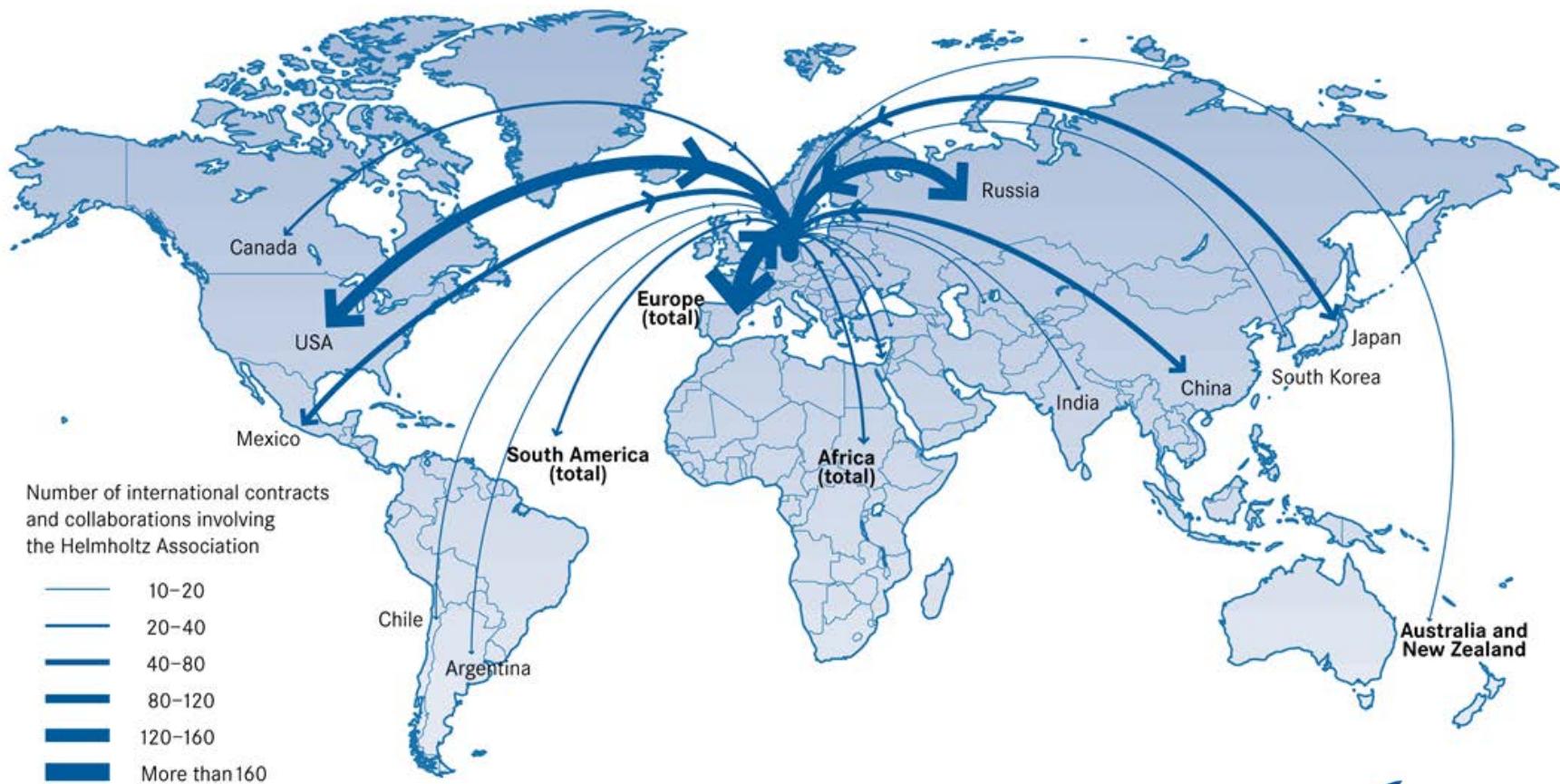
- **Funding instruments:**
 - Helmholtz Validation Fund
 - Helmholtz Enterprise
 - Helmholtz Innovation Labs
 - Innovation Funds at Helmholtz Centers
- **Events:**
 - Innovation Days as technology and partnering platform
 - Research Days with industry
(e.g. Roche in 2012, Bayer in 2013, Bosch in 2014)



Plivio Pore Implant/Forschungszentrum Jülich

Helmholtz International

International contracts and collaborations involving
the Helmholtz Association (worldwide)



Helmholtz International

- New large-scale facilities with international participation (e.g. XFEL, FAIR, Wendelstein7-X)
- Participation in international projects (e.g. ITER)
- Binational programs
- 3 Liaison offices in Brussels, Moscow, Beijing
- Bilateral partnerships around the world
- **7,500** foreign scientists at Helmholtz Centers

Team Moscow Office



- **Elena Eremenko,**
Head of the office
- **Yulia Gurkina,**
Assistant
- **Aleksei Shipilov,**
PR and Project
coordination



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Flagship Projects



- Facility for Antiproton and Ion Research in Darmstadt: GE and RU are the biggest concession partners, over 200 Mio Euro. FAIR RUSSIA RESEARCH CENTER
- The European X-Ray Free-Electron Laser in Hamburg. RU contribution over 300 Mio Euro. Summer school RACIRI

Helmholtz-Russia Joint Research Groups



Principal Investigator of HRJRG-116

- 2006-2014: 5 joint calls “Helmholtz-Russia Joint Research Groups”, a joint program of Helmholtz Association and Russian Foundation for Basic Research
- Funding per year: 130,000 euros (Helmholtz), 1,200,000 RUB (RFBR)
- Total funding by Helmholtz: over 12 million euro



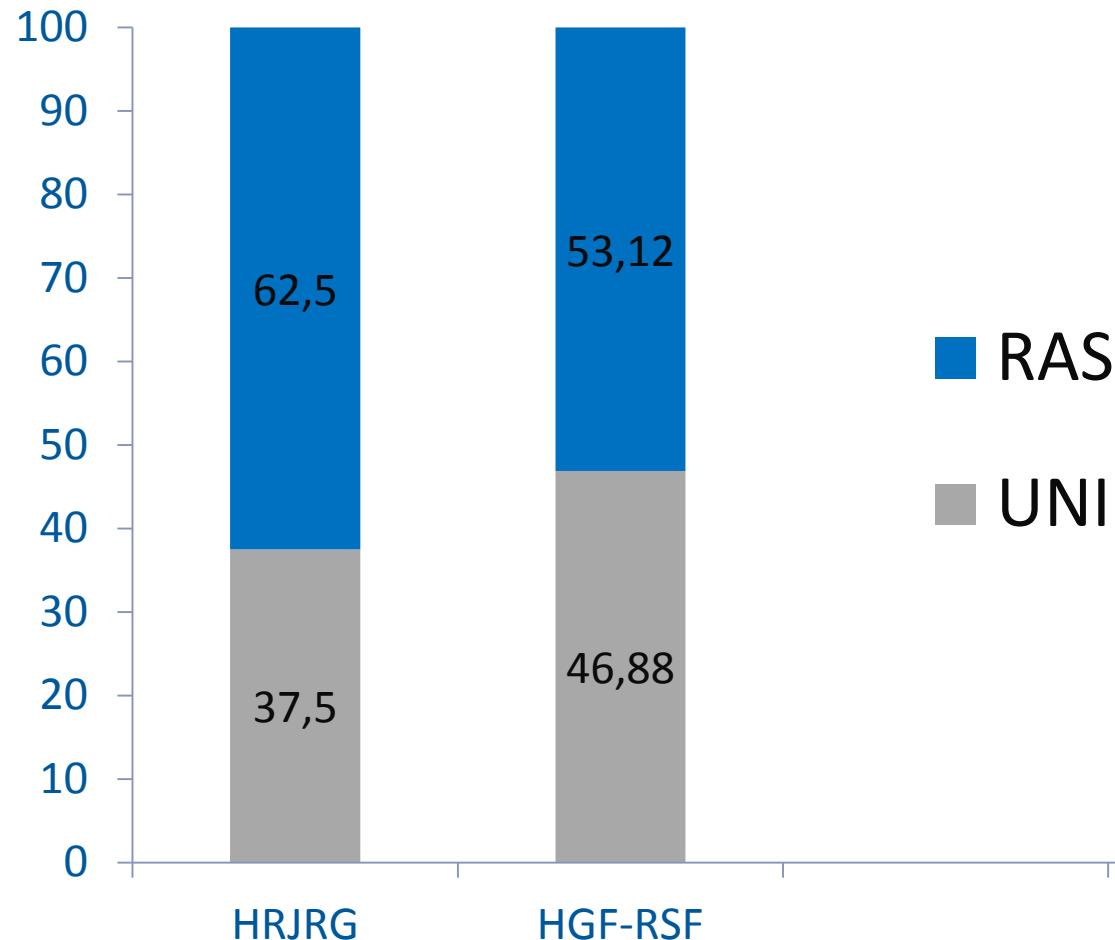
Helmholtz-Russia Joint Research Group-006

Helmholtz-RSF Joint Research Groups

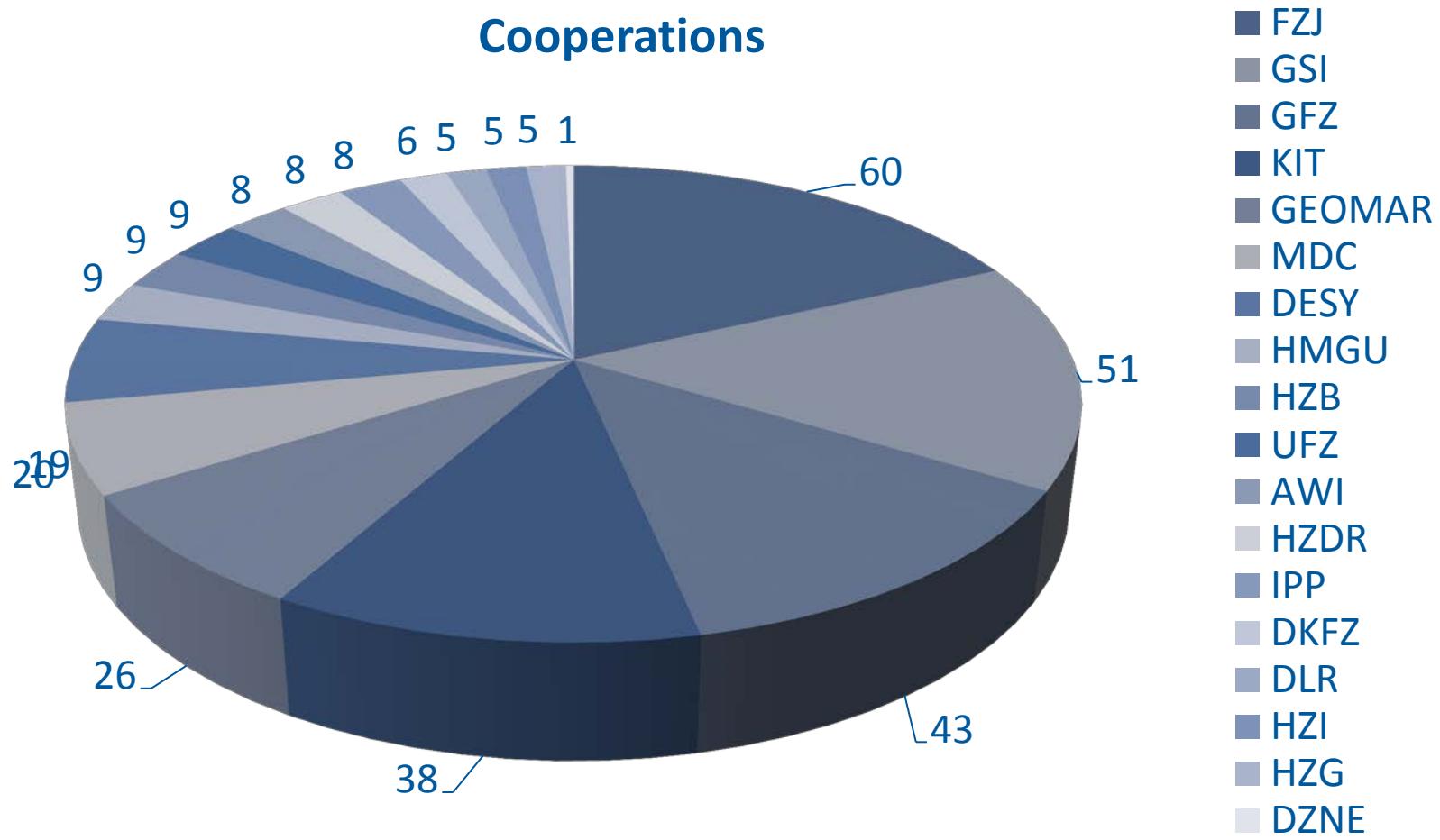


- Calls for Papers: 2017, 2018, 2019
- Duration: 3 Jahre
- Topics 2017: Biomedicine and Big Data; 2018: Climate Research, Energy Storage and Grid Integration; 2019: Materials and emerging technologies, Structure and Dynamics of Matter
- Applications until: 31. März 2017
- Funding: 09.2017-12.2019, 130.000€ (HGF) – 90.000 € (RSF) p.a.

Joint Programs with Russia



Cooperation of Helmholtz Centers with Russian Scientific Organizations

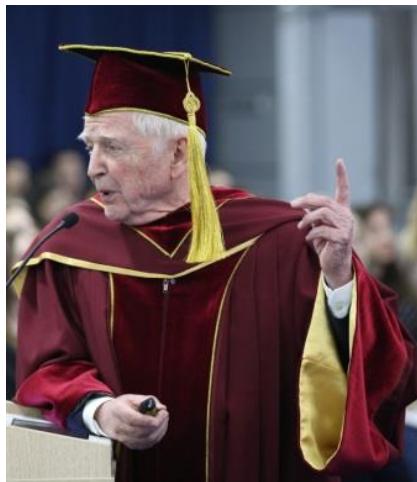


Helmholtz-Wintergespräche



- Annual event
- A strategic platform for exchanging opinions
- German and Russian representatives from science, education and politics
- Topic - Big Data Analytics
- Under the patronage of Mrs. Edelgard Bulmahn, Vice-President of the German Bundestag and Prof. Andrei Fursenko, Aid to the President of the Russian Federation for Science

Science Lecture



- Harald zur Hausen
- Nobel Laureate in Medicine 2008
- Science lecture “Infectious Nutritional Risk Factors for Cancers and Neurodegenerative Diseases”
- 26.04.2017, Moscow, Sechenov University
- Over 800 visitors and over 1000 online listeners
- Link to online video:
https://www.youtube.com/watch?v=Fl_v1snCdUE
- Seminar for young scientists

Summer School Sotchi, 16-22.10.2016



- Russian-German Summer school “Scientific collaboration – contribution to sustainable development” Helmholtz-Vernadsky foundation
- Topics: Climate change, biodiversity preservation and Arctic research
- 10 German and 10 Russian participants



Summer School Repino, 21-28.-08.2016

- RACIRI Summer school „convergent science and technologie for society“
- Joint project of Russia, Germany and Sweden
- Well-known scientists, inventors and professors from leading universities



BioSoft @PIK



- 14-16 May, 2017, Peterhof, Russia
- NRC «Kurchatov Institute», Forschungszentrum Jülich, CREMLIN EU Project
- Structural research of biomolecules on atomic level
- Large macromolecular complexes
- Structural dynamics on atomic and molecular level

Falling Walls in Berlin, 08-10.11.2016



- 2015-2016 FWL in Russia: Krasnoyarsk, Moscow, Tomsk
- For the first time 2 participants from Russia reached the final in Berlin
- Maxim Nikitin from MIPT – one of the winners
- Prof. Fursenko attended the FWL in Berlin



IDEAS 2020 - A tour of the world of tomorrow



- Innovative exhibition concept
- Complexity and diversity of science
- Seven steles stand for seven major challenges
- Moscow - Kazan - Tomsk - St.Petersburg
- 25 000 visitors
- Program accompanying the exhibition: guest lectures, readings



IDEEN 2020
Ein Rundgang durch die Welt von morgen

 HELMHOLTZ
ASSOCIATION

Helmholtz Perspektiven – Russian Edition



- For 3 years, current information and the latest developments from the Helmholtz Association for our Russian partners
- The most interesting articles from all the books are published in Russian.
- Distribution of the magazine at all events, shipping to partners, thereby increasing the awareness of the Helmholtz Association as a research organization

Thank you



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Dr. Elena Eremenko
the Helmholtz Association, Moscow