German Aerospace Center (DLR)

H2020 AREO-UA Project

19 April 2017

Nicolas PETER
Head International Relations

DLR
German Aerospace Center

- **Research Institution**
  - Aeronautics
  - Space
  - Energy
  - Transport
  - Security & Defence
- **Space Administration**
- **Project Management Agency**

DLR

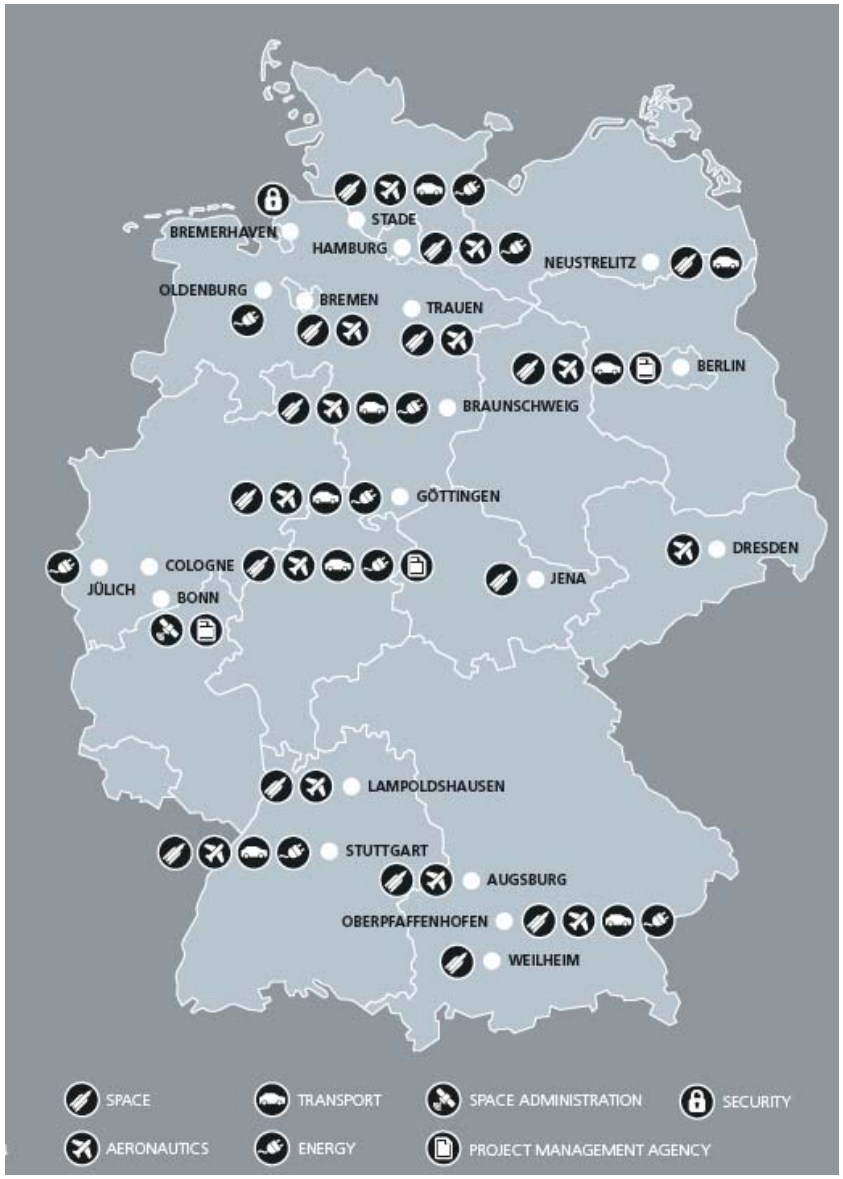
Locations and employees

~ 8.200 Employees

33 institutes & facilities spread (6 new) over 16 sites across Germany (4 new)

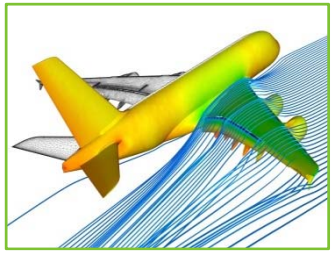
3 Field stations in O'Higgins (Antarctica), Inuvik (Canada) & Almeria (Spain)

5 Liaison Offices in Berlin, Brussels, Paris, Tokyo and Washington D.C



DLR

6 New DLR Research Institutes



+ 3 New Institutes for Aeronautics Research
in Augsburg (Bavaria), Dresden (Saxony) and Hamburg
Emphasis on *Digitalization in Aeronautics Research „Virtual Aircraft“*

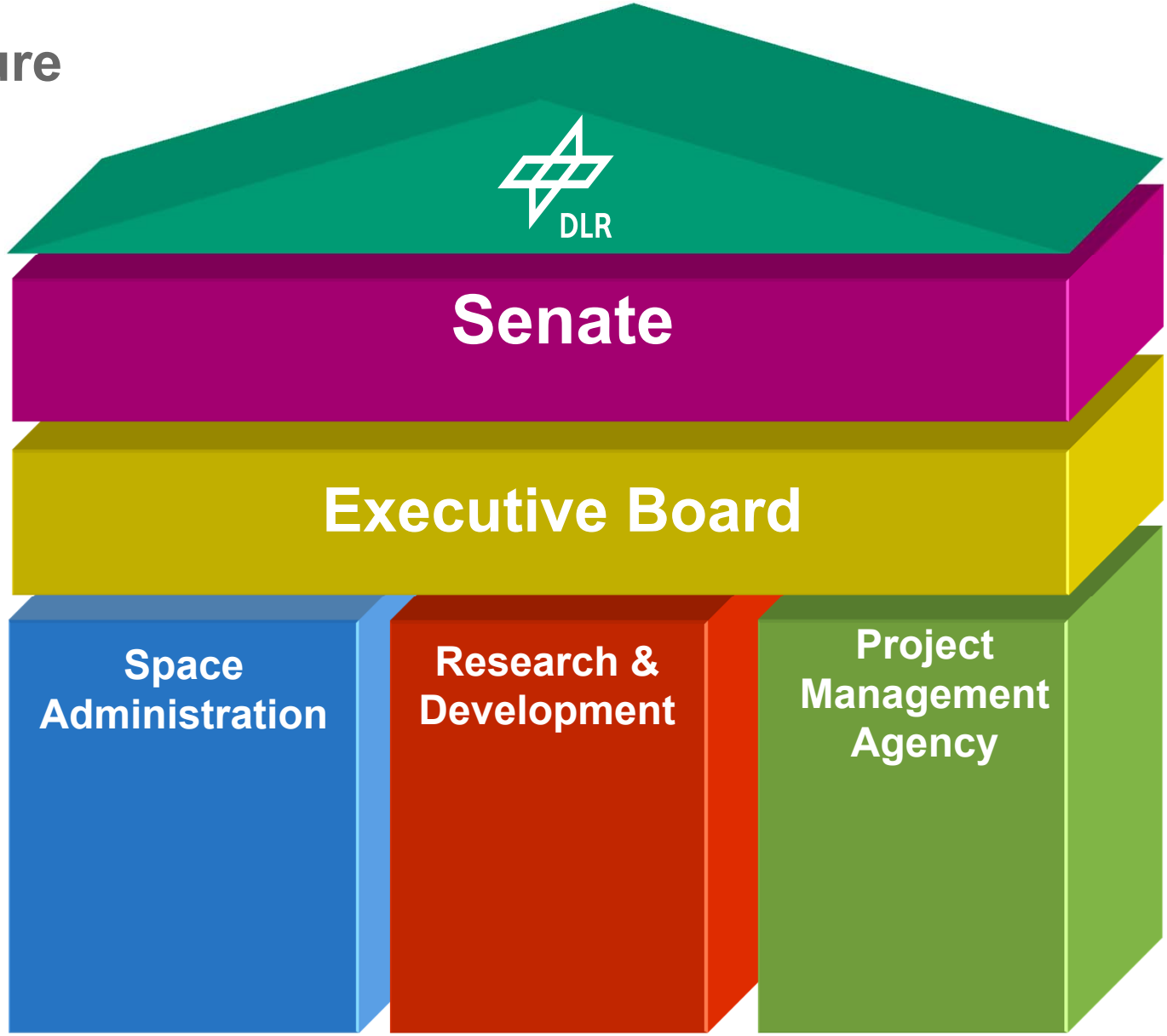
+ 1 New Institute for Space Research
in Jena (Thuringia)
Focus on *Big- & Smart-Data*

+ 1 New Institute for Energy Research
in Oldenburg (Lower Saxony)
Focus on *System Aspects of the Transformation of the Energy System*

+ 1 New Institute for Safety & Security Research
in Bremerhaven (Bremen)
Emphasis on *Safety of Critical, Maritime Infrastructures*

DLR **39 Research Institutes**
20 Sites & Locations across Germany

Structure



DLR

Executive Board

Prof. Dr. Pascale Ehrenfreund Chair	■ Overall strategy and development ■ External relations ■ Corporate Communication ■ ESA Council
Klaus Hamacher Vice Chair	■ Human Resources, Finance, Corporate Organisation ■ Quality Assurance and Infrastructure ■ Technology Marketing ■ Information technology ■ Project Management Agency
Dr. Gerd Gruppe	■ Space Administration ■ National/ESA programme
Prof. Dr. Hansjörg Dittus	■ Space Research and Technology: research, programs, projects, technology transfer
Prof. Rolf Henke	■ Aeronautics: research, programs, projects, technology transfer ■ Approved Design Organisation
Prof. Karsten Lemmer	■ Transport and Energy: research, programmes, projects, technology transfer

1) acting

Participation in the Helmholtz Association

HELMHOLTZ GEMEINSCHAFT

AWI · DESY · dkfz. · DLR · DZNE Deutsches Zentrum für Neurodegenerative Erkrankungen in der Helmholtz-Gemeinschaft · GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel

GSI · GFZ Helmholtz-Zentrum Potsdam · HZB Helmholtz Zentrum Berlin · HZDR Helmholtz Zentrum Dresden Rossendorf · Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung · JÜLICH Forschungszentrum

KIT Karlsruher Institut für Technologie · Helmholtz Zentrum für Infektionsforschung · HelmholtzZentrum münchen · Helmholtz Zentrum für Umweltforschung UFZ · MDC Max-Delbrück-Centrum für Molekulare Medizin Berlin-Buch in der Helmholtz-Gemeinschaft · IPP

Main characteristics of the DLR general strategy

Programme Management Research & Development

Institutes and Facilities

Know-how, Research facilities

Programme Directorates

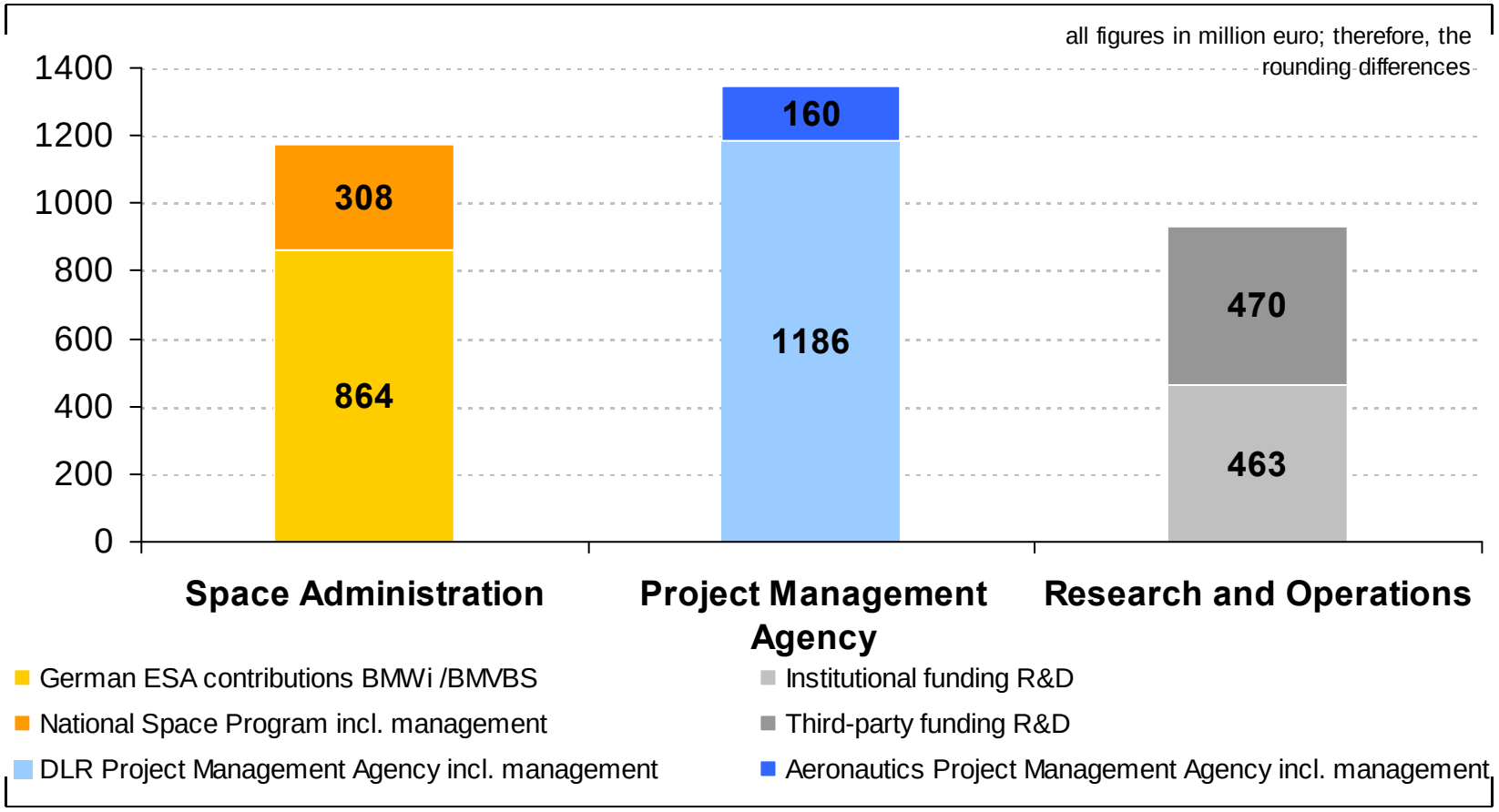
- Aeronautics
- Space Research and Technology
- Energy
- Transport

Resources

Service and resource agreements

Projects Programmes

Financing of DLR and research funding 2017 (planned)



without settlement of cross-financing

Aeronautics

DLR Aeronautics

- Optimise the performance and environmental compatibility of the entire aircraft system
- Expand the range of helicopters to all weather conditions
- Increase efficiency and environmentally-friendly aircraft engines
- Develop safe, environmentally-friendly and efficient air traffic (flight control, flight operations)

DLR

Goals and Strategies of Aeronautics

Primary goals

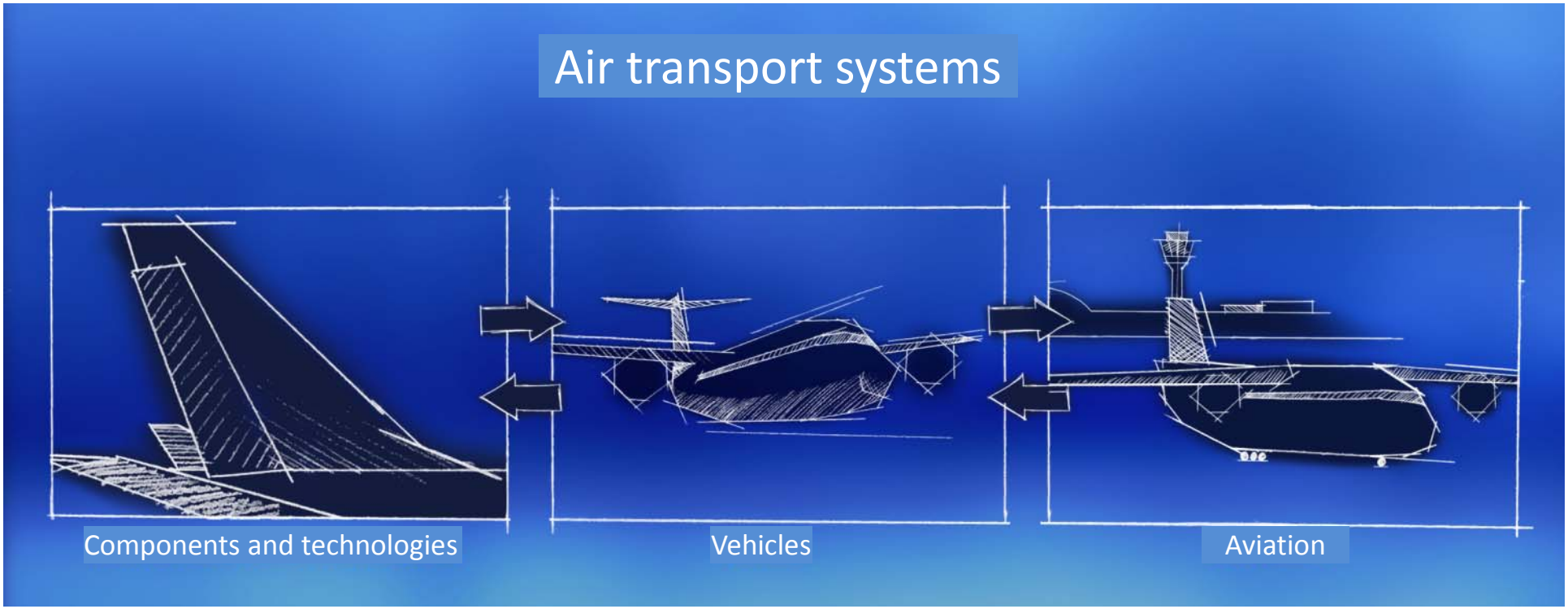
- Further development of civilian transport systems from the perspectives of efficiency/economy, safety and environmental compatibility
- Technological contributions towards assuring the capability profile of the German armed forces

Fundamental strategic components

- Orientation with the European research agenda for civil aviation
- Research into the complete air transport system and all its major components
- Carrying out specific defence-related research work, making greatest possible use of synergies with civilian themes
- Strategic cooperation with the most important German and European partners from research and industry

DLR

System capability in research

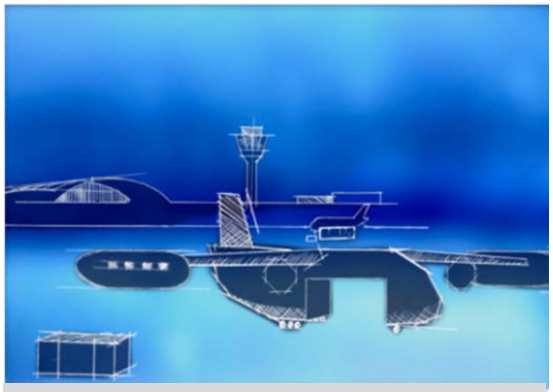


DLR

Key Concepts

The Short-Range Aircraft

The Long-Range Aircraft



The Unmanned Freighter

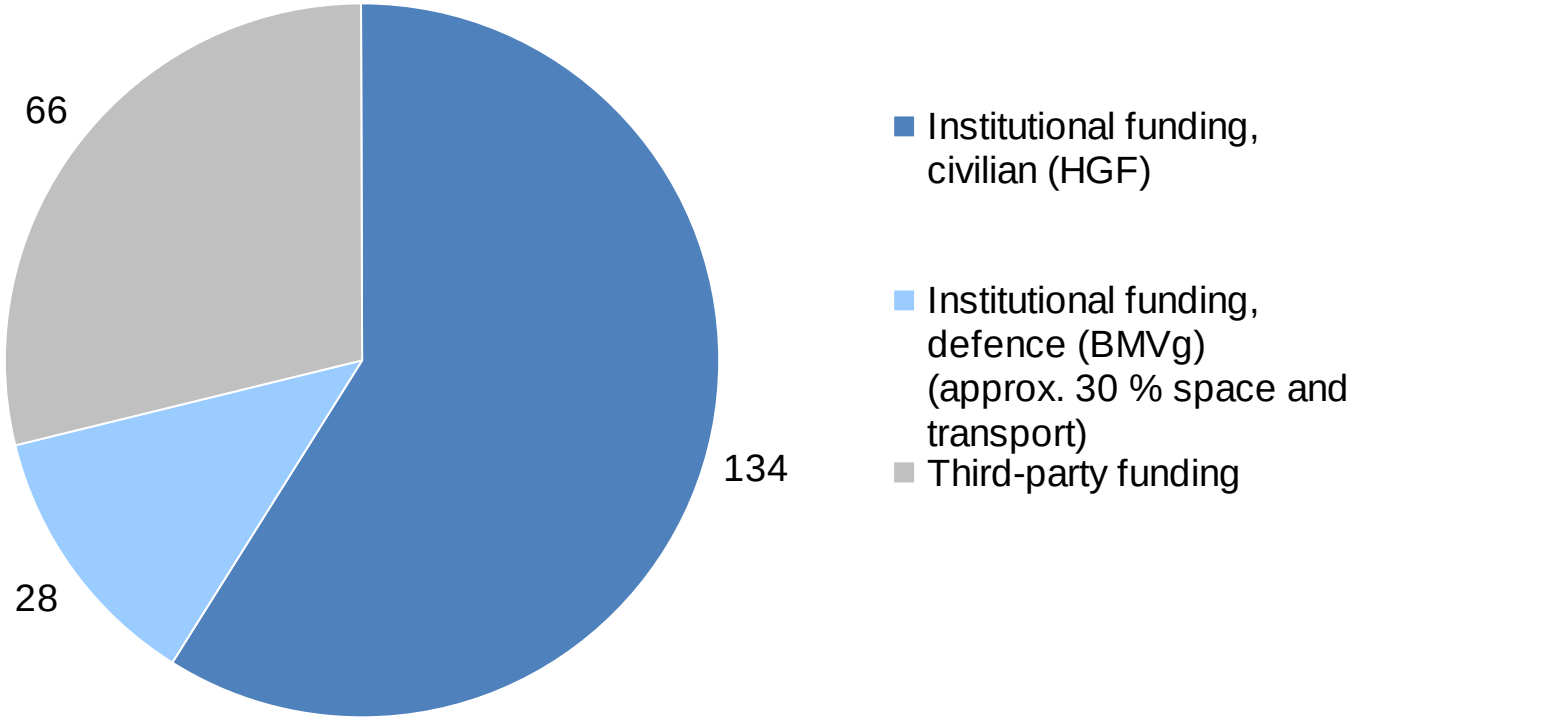
The SAR Helicopter 2030

The Efficient Air Transport

The Virtual Product

Resources in Aeronautics 2016 (planned) Total resources € 228 million

All values in € million



DLR

Sites Involved in Aeronautics

Augsburg
Braunschweig
Goettingen
Hamburg
Cologne
Oberpfaffenhofen
Stade
Stuttgart
Lampoldshausen

Facilities – Aeronautics

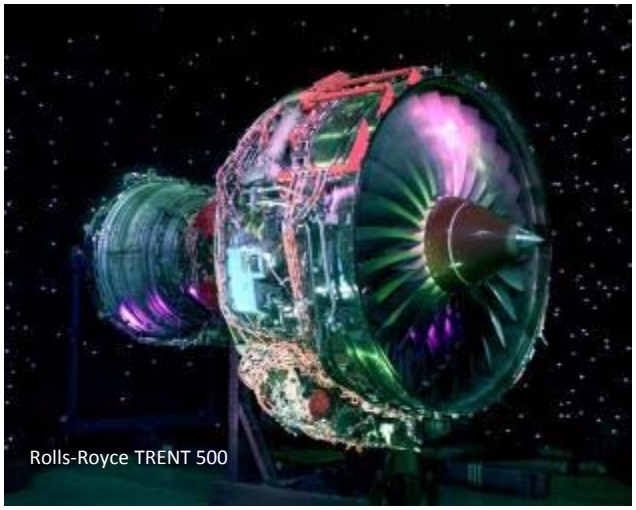
- Research aircraft
- Cockpit simulators
- Tower simulator
- Compressor, combustion chamber and turbine test beds
- Autoclaves
- Material and structural test facilities
- Ground vibration test facility
- Wind tunnels*

* Predominantly under the auspices of German-Dutch Wind Tunnels (DNW)

DLR Institute of Propulsion Technology

Missions:

- **Efficiency increase**
  (resource consumption and direct operating costs)
- **Minimisation of environmental impacts**
  (emissions and noise)
- **Acceleration of product developments**


Rolls-Royce TRENT 500


Siemens Energy 4000 F

Organisation

Institute of Propulsion Technology
Reinhard Mönig

Components

Engine
Andreas Döpelheuer

Fan and Compressor
Eberhard Nicke

Combustor
Christoph Hassa

Turbine
Frank Kocian

Combustor Testing
Christian Fleing

Technologies

Numerical Methods
Edmund Kügeler

Engine Acoustics
Lars Enghardt

Measurement Technology
Christian Willert

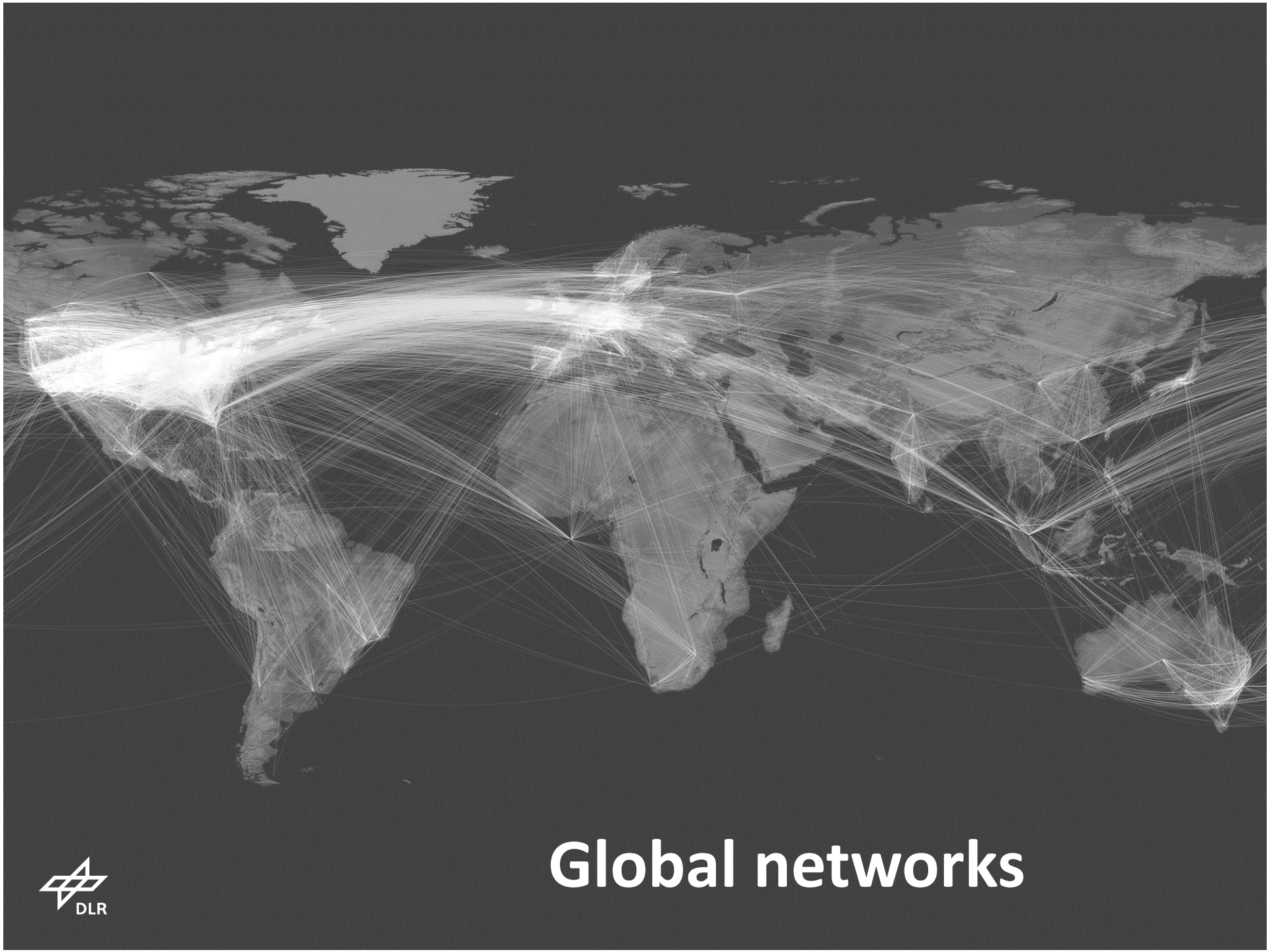
Combustor Simulation
Francesca di Mare

DLR

Fan and Compressor

- Design of efficient and silent fans and of highly loaded, multi-stage axial-flow compressors
- Design and experimental investigation of high-performance centrifugal compressors
- Experimental investigation of compressor cascades, new fan designs, multi-stage axial-flow compressors (4-stage rig) and advanced centrifugal compressors

DLR


Global networks

DLR and International Cooperation

International cooperation is key for DLR and a core elements for most of its endeavours

DLR cooperates with all types of **actors**: space and research agencies, universities, companies etc.

DLR cooperates with **European partners bilaterally** and in the context of **ESA** and **EU programmes**

DLR cooperates also with all **major actors** worlwide

DLR International Partners

We cooperate with
over 400 Partner-Organisations in
more than 60 countries

DLR

National and International Networking

Customers and partners: Governments and ministries, agencies and organisations, industry and commerce, science and research

DLR

Our strengths

DLR provides:

Unique synergies of 5 research areas, space administration and project management agency

Innovative research from basic research to product development

Reliable partner for politics, industry and society

Thank you for your attention

Дякую за увагу