

Press releases 2008

Research for the future – shaping the future

28 May 2008



Chancellor Angela Merkel at the ILA

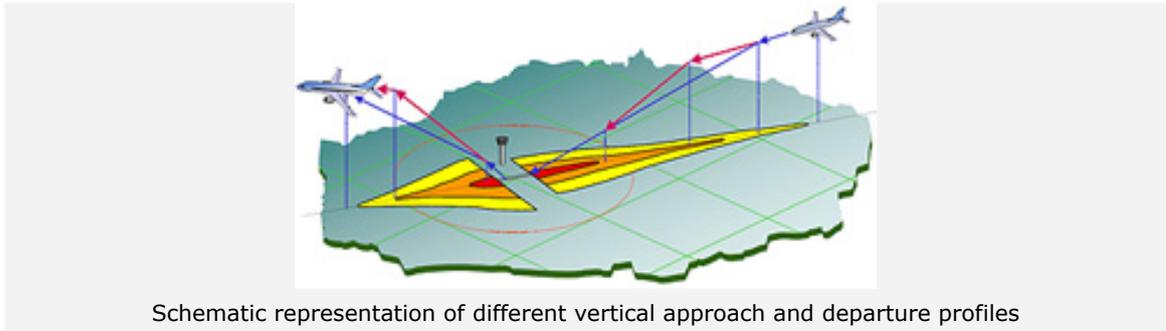
The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) is constantly developing its core areas of aviation and space exploration. In addition, potentials for synergy are increasingly realised. "This should enable us to make even more socially relevant contributions than before, for instance in the environmental field", said Professor Johan-Dietrich Wörner, Chairman of the DLR Executive Board. Wörner went on to say: "Moreover, it is vital to position DLR nationally as well as internationally as a leading aerospace research institution - and also as an institution which represents the interests of the Federal Republic of Germany on the international stage, especially in the field of space exploration."

In addition to this, cross-sectional tasks such as business start-up support and the promotion of young talent should become more important in the future. All this leads to a new structure for DLR which is geared towards these objectives. Success will be measured by a qualitatively higher level of efficiency. The working premise is: clear competences, clear responsibilities. "Professional expertise" and "interdisciplinary interaction" are realised at the same time. This May, for instance, after a start-up time of just seven months, a high-performance computer was put into service at the Braunschweig DLR site, forming the core of the C²A²S²E simulation centre (Center for Computer Applications in AeroSpace Science and Engineering). C²A²S²E has been set up as a goal-oriented research environment and is organised as a campus. This enables direct integration of research, development, and industrial application. The project is realised in partnership with Airbus and the German federal state of Lower Saxony.

In order to foster a mutual research and technology transfer between civilian applications on the one hand and defence applications on the other, defence research topics have been integrated into DLR's multidisciplinary civilian research activities.

The aim is to give results of civilian research the widest possible application, and to supplement aspects specific to defence with our own research and development projects. DLR's defence research programme contributes to meeting the Bundeswehr's demands and to bridging its expertise gaps through applied research.

Aeronautics research



Schematic representation of different vertical approach and departure profiles

The main priority for DLR's aeronautics research is to strengthen the competitive advantage of the national and European aeronautical industry and aviation sector, and to meet political and social demands. Because of its long-term research experience, DLR has gained a wealth of knowledge in all aspects of fuel cell technology, from theory, to system development, system commissioning, and integration. Combined with systems expertise (for instance with regard to the qualification and certification of aviation systems), this makes DLR especially qualified for research and development activities on aircraft fuel cell applications. As part of the ELBASYS project, which is supported by the German Federal Ministry of Economics and Technology (Bundesministerium für Wirtschaft und Technologie; BMWi), a fuel cell was integrated into DLR's A320 ATRA research aircraft and successfully operated.

The "Low-noise Approach and Departure Procedures" research project ("Lärmoptimierte An- und Abflugverfahren"; LAnAb) was concluded. The goal of this project was to develop and test approach and departure procedures to decrease the noise load around commercial airports. With the same aim, simulation tools were also developed and examined during flight tests. A precise knowledge of the noise emission of the separate noise sources of the aircraft allows the approach and departure procedures to be optimised with regard to their noise effect. A further research question is how such optimised procedures can be integrated into the air traffic management of a large airport.

As a partner in the EU "VITAL" project, DLR's aeronautics research contributes to the realisation of goals relating to engines: reduction of carbon dioxide emission by about seven percent, and noise reduction by about six decibels. The Snecma company has developed the concept of a counter-rotating, low-speed fan for a high-bypass engine. Within this project, DLR is responsible for the aerodynamic and aeroelastic, as well as the acoustic and mechanical development of a cost-efficient version with a reduced number of blades.

Space research

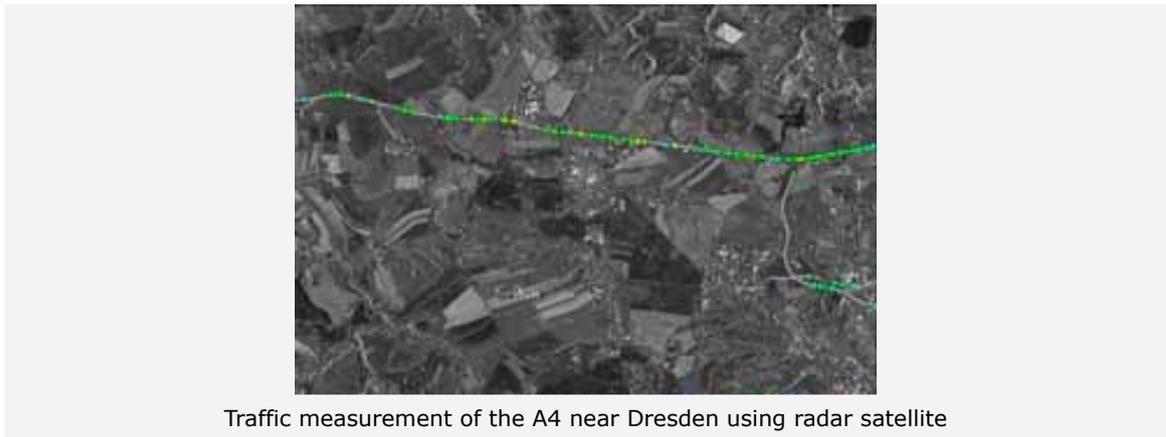


The flying observatory SOFIA during its first test flight

From experiments in weightlessness and aerospace systems engineering to exploring other planets and environmental monitoring from space: DLR's astronautical activities cover a broad spectrum.

The results of astronautics research, for instance, suggest new approaches to improving airport security checks without compromising the mobility and comfort of passengers. At DLR, a so-called terahertz scanner is being developed which will allow hazardous materials and weapons to be discovered even faster and more reliably than now, without disrupting the normal course of business. The basis for this technology was developed in the context of the Sofia project, the flying space telescope. In the context of the EU TeraSec project (Active Terahertz Imaging for Security), coordinated by DLR, a prototype was developed and its technical feasibility was established.

Based on their behaviour, the material characteristics of ceramics enable new technologies to be introduced in the propulsion technology of launch vehicles, for instance for combustion chamber cooling, for the injection head, and for the nozzle. DLR and Astrium are currently working on the "Propulsion 2010" project together. The goal is to develop a ceramic engine, the "Black Engine". The project will bring together DLR's expertise in ceramic materials engineering and thrust chamber research and Astrium's expertise in combustion chamber development.



Traffic measurement of the A4 near Dresden using radar satellite

The interaction with DLR's other research areas is increasingly important for astronautics research. An example of this is a series of tests which are currently being conducted over the course of several months, and which are aimed at obtaining traffic information via satellite. Using the German TerraSAR-X radar satellite, certain stretches of motorway in Germany, Austria and Switzerland, as well as in California, are being monitored.

The aim is to develop a technique for large-scale collection of traffic data which can be operated without using ground equipment, and which allows fast transmission of traffic data to traffic information services. A second example is the collaboration between DLR institutes in the aeronautics and energy fields, aimed at using satellite Earth observation for the benefit of the energy industry. Using weather satellites to measure solar irradiation over a period of many years, scientists are looking for optimal locations for solar power plants in the Mediterranean area.

Space Agency

The Space Agency develops and implements the German space programme on behalf of the German federal government. The programme integrates all German astronautical activities, both at the national and at the European level. As part of this programme, the German radar satellite TerraSAR-X was launched from Baikonur on 15 June 2007. On 7 January 2008, the satellite became fully operational. All systems are functioning faultlessly, and the quality of the data products is higher than expected. Since it was put into service, thousands of products have already been delivered to users throughout the world. Moreover, a fast data transmission link could be established between TerraSAR-X on the one hand, and the American NFIRE satellite on the other, over a distance of 5 000 kilometres. This was realised using an LCT (Laser Communication Terminal), yet another example of cutting-edge German technology.

Since February 2008, the European space laboratory COLUMBUS is docked to the International Space Station ISS. The first German experiments have already been conducted, and the first results have been brought back to Earth by the STS-123 Shuttle mission. The current mission of the ATV European supply spacecraft also exceeds all expectations so far. After the successful completion of all test manoeuvres during its approach to the ISS, ATV was the first European spacecraft to fully automatically complete a docking procedure. Moreover, ATV has boosted the ISS in its orbit through a re-boost manoeuvre.

Related Contacts

Andreas Schütz

Deutsches Zentrum für Luft- und Raumfahrt (DLR) - German Aerospace Center
Corporate Communications, Spokesman
Tel: +49 2203 601-2474
Mobile: +49 171 3126466
Fax: +49 2203 601-3249
E-Mail: andreas.schuetz@dlr.de

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