



Research highlights in the Stuttgart Region:

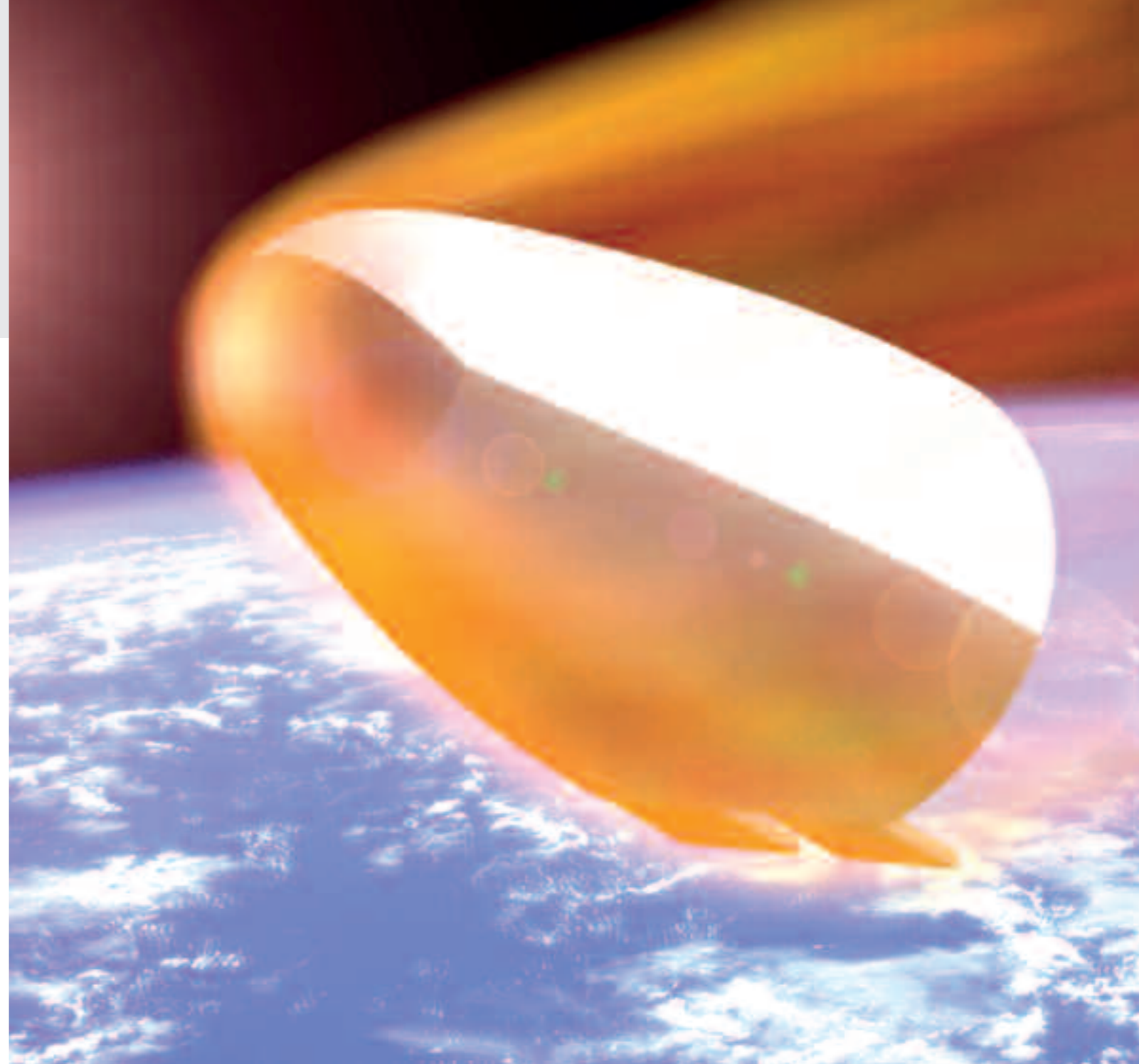
The University of Stuttgart's plasma wind canal

Regional aerospace companies can have their products simulated and tested in the plasma wind canal at the Institute for Aerospace Systems. For example, it took the space capsule Huygens more than two hours to fly through the atmosphere of Saturn's moon Titan before landing on its surface. A shield of glass foam protected the capsule from the extremely high temperatures it encountered while entering the atmosphere. This material was tested in the plasma wind canal in Stuttgart.

Stuttgart, the German headquarters for the SOFIA programme

For the next 20 years, Stuttgart will be the German SOFIA programme headquarters for the Boeing 747SP that will carry a 2.7 m reflecting telescope. This flying observatory will make it possible to observe stars and solar systems as they evolve. The light transmitted by these young objects are too weak to be perceptible from the earth's surface: they begin to be visible from an altitude of about 13 km.

SOFIA is a cooperation project with partners that include the Stuttgart airport, seven institutes at the University of Stuttgart and 15 medium-sized companies from the State of Baden-Württemberg.



**Wirtschaftsförderung
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The Aerospace Industry in the Stuttgart Region

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Project 1: Building lightweight planes – one of Baden-Württemberg's strengths

Baden-Württemberg has been building light-weight aircraft for forty years. The first fibre-reinforced plastic glider – designed and built at the University of Stuttgart – completed its maiden flight in 1957. Today, the manufacturer Schempp-Hirth Flugzeugbau GmbH (Kirchheim/Teck) is the world market leader for glider planes made of fibre-reinforced plastics.

Sample project 3: Satellite technology from Baden-Württemberg

Satellite-supported earth surveillance also belongs to Baden-Württemberg's and the Stuttgart Region's areas of expertise. Baden-Württemberg's aerospace industry was a major contributor to the environmental satellite Envisat that will help track climate change as well as changes in the oceans and in the earth's ice fields and vegetation.

Envisat is the largest earth surveillance satellite ever built in Europe. Tesat-Spacecom (Backnang), RWE Solar (Heilbronn) and Thales Electron Devices (Ulm) were major component suppliers. Atrium, located in Friedrichshafen, served as the project contractor.

The Stuttgart Region's position within the State of Baden-Württemberg

The aerospace industry in the Stuttgart Region has a long-standing tradition and a prominent reputation in the field. Famous regional aerospace pioneers include Graf Zeppelin, Eugen Sänger, Ulf Merbold and Ernst W. Messerschmid.

There are few areas in Germany or even throughout the world that can offer so many (and such a diversified combination of) global players, medium-sized aerospace companies, universities and research institutions. Twenty-five percent of Baden-Württemberg's aerospace companies have their headquarters in the Stuttgart Region. And eighty percent of the state's related research institutions are located here as well.

It is also interesting to note how many aerospace engineers there are who have studied at the University of Stuttgart. Between seventy and eighty percent of all German aerospace engineers have earned their degrees there.

Companies

A selection of leading companies that operate in the Stuttgart Region:

- Tesat-Spacecom GmbH & Co. KG, Backnang
Tesat-Spacecom manufactures sub-systems, modules, and converters for satellites in Backnang.
- Fichtner Airports GmbH, Stuttgart
This subsidiary of Fichtner GmbH & Co. KG specializes in planning and consulting for the development of various kinds of airports.
- Thales ATM Navigation GmbH, Korntal-Münchingen
As a subsidiary of Thales S.A., the Thales ATM Navigation GmbH has 115 employees that work on the design, production and marketing of equipment, systems and installations for air traffic control.

- innovative navigation gmbh, Kornwestheim
The company has developed a navigation system for national shipping that allows for more efficient loading of ships.

Some suppliers from other areas of the mobility cluster, like for example Behr Industrietechnik and the Recaro subsidiary Recaro Aircraft Seating GmbH (the world's third largest producer of air-plane seats), also have successful aerospace engineering operations. Bosch GmbH develops and manufactures diverse telematics systems and is also one of the most important partners in the Galileo consortium. One of Europe's leading navigation software providers is Marco Polo, a well-known publishing house for tourism and travel located just south of Stuttgart in Ostfildern.

Research

The Stuttgart Region has an excellent research infrastructure: 14 of 18 research organisations working in Baden-Württemberg in the aerospace industry are located in Stuttgart, including many institutes of the German Aerospace Centre (DLR) and ten institutes at the University of Stuttgart's Department of Aerospace Engineering and Geodesy.

Important related research organisations in Stuttgart:

- IFB Institute, University of Stuttgart (aircraft design)
- ILA Institute, University of Stuttgart (aviation propulsion systems)
- IRS Institute for Space Systems, University of Stuttgart
- INS Institute, University of Stuttgart (navigation)
- ISD Institute, University of Stuttgart (statics and dynamics in aerospace design and engineering)
- ITV Institute for Combustion Technology, University of Stuttgart
- IKE Institute, University of Stuttgart (nuclear engineering and design)
- IAG Institute, University of Stuttgart (aerodynamics and gas dynamics)
- IFR Institute of Flight Mechanics and Control, University of Stuttgart
- ITLR Institute of Thermodynamics for Aeronautics and Astronautics, University of Stuttgart
- Institute of Combustion Technology, German Aerospace Centre DLR Stuttgart
- IBK Institute of Structures and Design (DLR-Cluster of Materials and Structures), German Aerospace Centre DLR Stuttgart
- ITT Institute of Technical Thermodynamics, German Aerospace Centre DLR Stuttgart
- MPA Materials Testing Institute, University of Stuttgart

Sample project 2: Innovation through co-operation

Technology partnerships are the key to success. A look at the oil-cooling system for the helicopter engine MTR 390, made by the Munich-based manufacturer MTR, illustrates this. The oil-cooling system was supplied by the Stuttgart-based company Behr Industrietechnik that cooperated with a number of Baden-Württemberg companies, among them, the ASG Luftfahrttechnik und Sensorik (Weinheim) and Zollern (Sigmaringen).

Sample project 4: Up, up and away

The icaré 2, the world's first solar-powered glider able to take off without being towed, was developed at the University of Stuttgart by a team led by Prof. Rudolf Voit-Nitschmann. Due to its extreme lightweight design using carbon-fibre reinforced plastics (CFK), the solar glider can travel at speeds of over 120 km/h despite its 165 kg and 25 m wingspan. The icaré 2's developers won the City of Ulm's Berblinger Preis that attracted participants from all over the world.

The expertise gained in this project will also be used to develop new kinds of high-altitude platforms. At the University of Stuttgart an international team develops airships using solar and fuel-cell technology. Floating at an altitude of 20 km, these airships can be used as telecommunications platforms. Their advantage: high altitude platforms like these are substantially cheaper to operate than geo-stationary satellites.