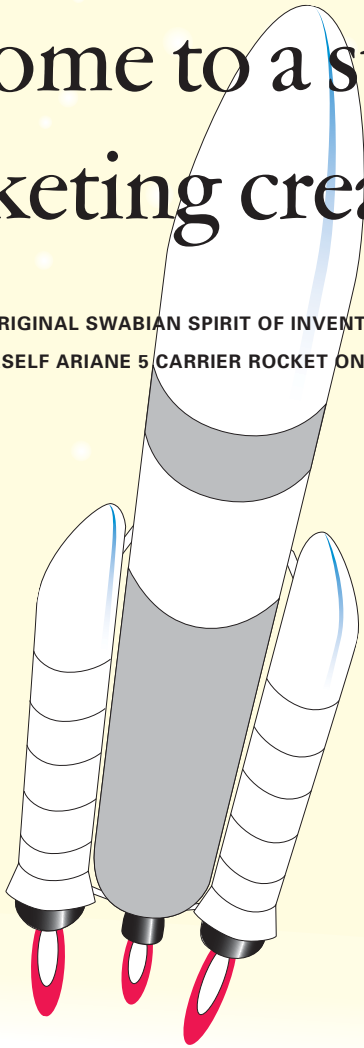
Welcome to a state with rocketing creativity!

TRY OUT THE ORIGINAL SWABIAN SPIRIT OF INVENTIVENESS WITH THIS BUILD-IT-YOURSELF ARIANE 5 CARRIER ROCKET ON A SCALE OF 1:150.



Baden-Württemberg

The German Southwest.

Aerospace enthusiasts are in seventh heaven here.

Baden-Württemberg is not only a hotbed of invention and the German record-holder in patent applications, it's also home to many aerospace pioneers – from Count Ferdinand von Zeppelin, the inventor of the rigid dirigible, to Ulf Merbold, Germany's first astronaut, who earned his PhD at the Universität Stuttgart. Baden-Württemberg remains true to this tradition with a large number of present-day aerospace highlights.

TOP RESEARCH

One of the tasks of the German Aerospace Center (DLR) in Lampoldshausen is to test the engines of Europe's Ariane heavy-payload launch vehicles. DLR institutes are also established at the Universität Stuttgart, a focal point of research.

Other key research takes place at the Universität Karlsruhe (TH), the University of Applied Sciences in Esslingen and at the institutes of the Fraunhofer Society – the Ernst Mach Institute (EMI) in Freiburg and the Institute for Chemical Technology (ICT) in Pfinztal.

TOP COMPANIES

Around 17% of the entire German aerospace sector is located in Baden-Württemberg – including EADS, Airbus, Diehl Avionik Systeme, Recaro, Zeppelin-Luftschifftechnik and Schempp-Hirth. Our companies not only build satellites, the Zeppelin NT and the best gliders in the world, they're also key suppliers to large-scale projects such as the Airbus A 380.

TOP UNIVERSITY PROGRAMMES

Around one third of all aerospace students in Germany are enrolled in Baden-Württemberg universities.

TOP ADDRESSES

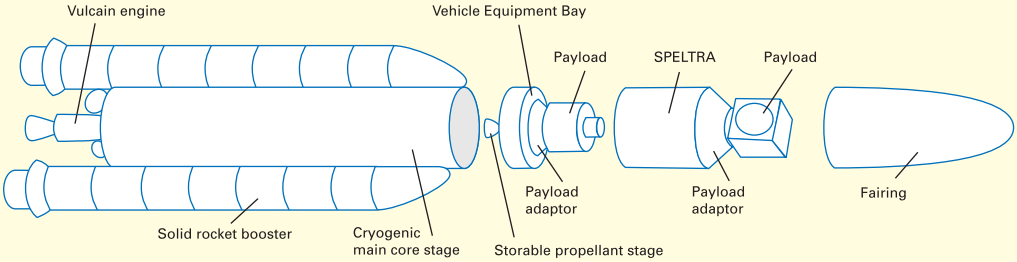
Baden-Württemberg is also home to top addresses for astrophysics, particle physics, microtechnology, new materials, energy supply, communications and geodesy, as well as important centers for astronomy such as the University and Max Planck Institute for Astronomy in Heidelberg. The Baden-Württemberg Forum for Aerospace (LRBW e.V.) has been a networking hub since 2005, turning the sector into a future-oriented cluster.

As you can see, we have plenty to offer in terms of aerospace. But you can see that for yourself on a scale of 1:1 – in Baden-Württemberg!

We're looking forward to welcoming you here!

BUILD YOUR OWN ARIANE 5!

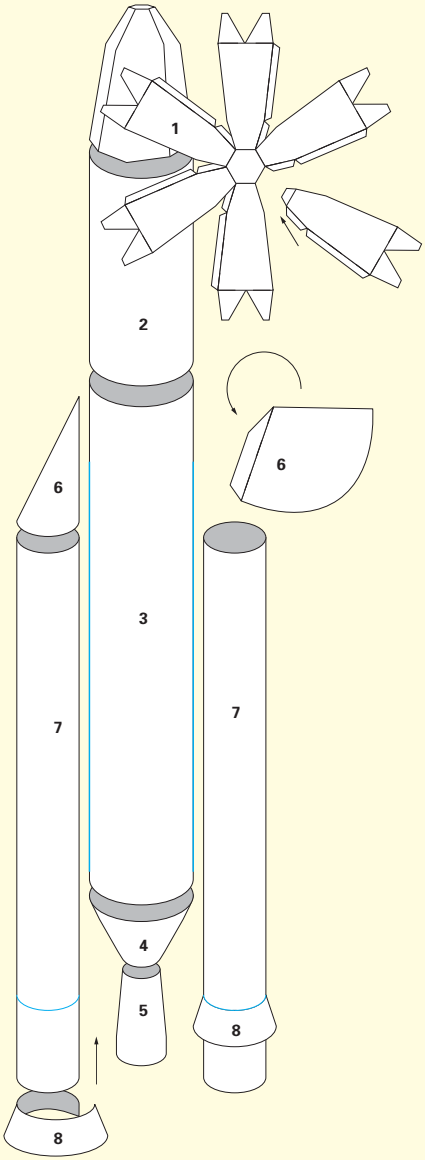
The German Aerospace Center (DLR) has acquired expertise unparalleled in Europe in developing and operating high-altitude simulation units for upper-stage engines. As part of the Ariane 5 Plus Programme of the European Space Agency (ESA) and the French space research center CNES, the DLR Lampoldshausen facility in Baden-Württemberg was charged with building the P4.1 high-altitude testing facility and carrying out developmental tests on the next-generation VINCI upper-stage engine. But enough dry facts! Here's your challenge: get into the legendary Swabian spirit of inventiveness, build your own Ariane 5, and put your future onto a spectacular trajectory – in Baden-Württemberg!



TYPE	Ariane 5G	Ariane 5G+	Ariane 5GS	Ariane 5ES	Ariane 5ECA	Ariane 5 *next generation*
MAIN STAGE FUEL	EPC Generic 158t LOX/LH2	EPC Generic 158t LOX/LH2	EPC Evolution (modified) 158t LOX/LH2	EPC Evolution 173t LOX/LH2	EPC Evolution 173t LOX/LH2	EPC Evolution 173t LOX/LH2
MAIN ENGINE	Vulcain I	Vulcain I	Vulcain I	Vulcain II	Vulcain II	Vulcain II
UPPER STAGE FUEL	EPS 9.7t MMH/N2O4	EPS Versatile 10t MMH/N2O4	EPS Versatile 10t MMH/N2O4	EPS Versatile 10t MMH/N2O4	ESC–A 14.4t LOX/LH2	ESC–B 28.2t LOX/LH2
UPPER STAGE ENGINE	Aestus (non-reignitable)	Aestus (reignitable)	Aestus (reignitable)	Aestus (reignitable)	HM-7B (non-reignitable)	VINCI (reignitable)
BOOSTER FUEL	EAP 238t solid fuel	EAP 238t solid fuel	EAP 241t solid fuel	EAP 241t solid fuel	EAP 241t solid fuel	EAP 241t solid fuel
PAYLOAD CAPACITY	6.1t dual GTO	6.3t dual GTO	5.8t dual GTO	20t to ISS (only planned for ATV launches)	9.1t dual GTO	approx. 11t dual GTO
USED	1996 – 2003	2004	from 2005	from 2007	from 2002	2014 at the earliest
STATUS	Withdrawn (16 flights)	Withdrawn (3 flights)	In use	Qualification phase	In use	Qualification phase

Source: DLR, September 2007

Rocket science made easy.



YOU WILL NEED:

› a sharp craft knife or scissors
› a straightedge or similar tool to score along the fold lines
› paper glue
› a wooden rod or long pencil

Cut the parts out along their outlines with a craft knife or scissors.

Score the parts along the dotted fold lines.

Glue the parts together in the order shown here, and then assemble the parts into the complete model.

The nose **1** of the main rocket consists of six parts. Gently bend the lower edges with the tabs into a round shape to ensure a good fit into the body.

It is also a good idea to gently roll the body parts **2, 3** and **7** before gluing their seams to ensure a nice round shape.

The skirts **8** of the solid fuel boosters are a sliding fit on the main body and do not need to be glued in place.

Finally, glue the two solid-fuel boosters onto the main rocket along the blue lines.

Have fun!

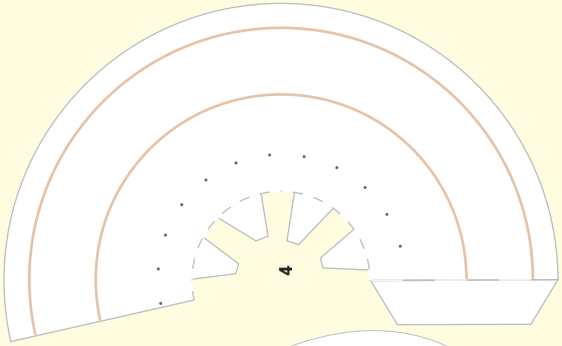
Would you like to build other successful designs from Baden-Württemberg? Visit **www.schreiber-bogen.de** for traditional Schreiber cut-out sheets and construction tips.

8

8

7

7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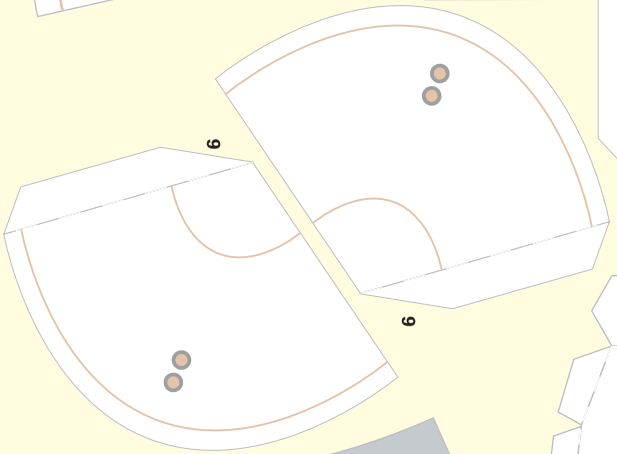
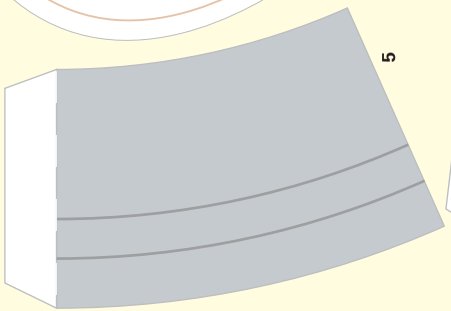

6
6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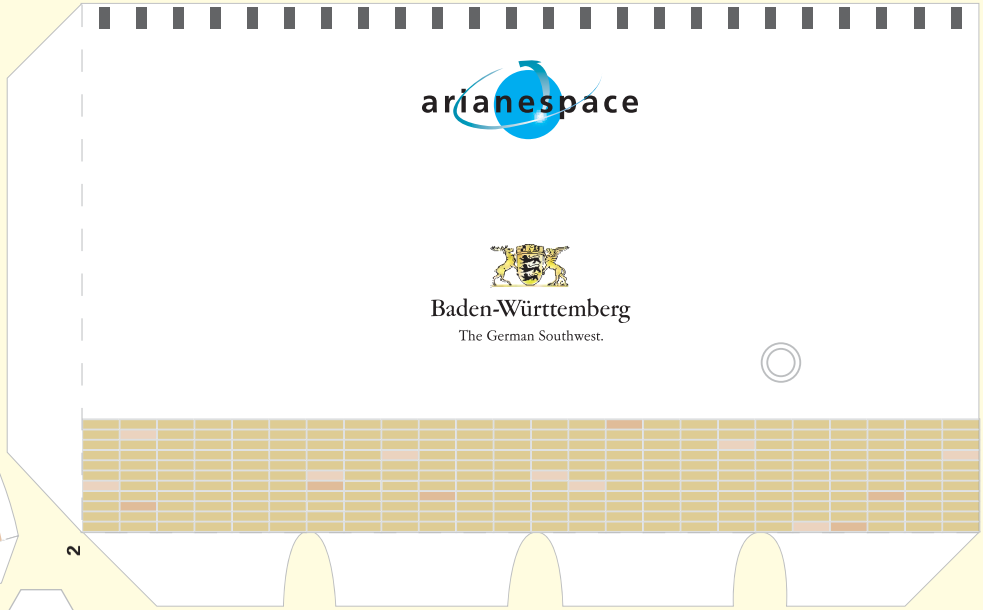
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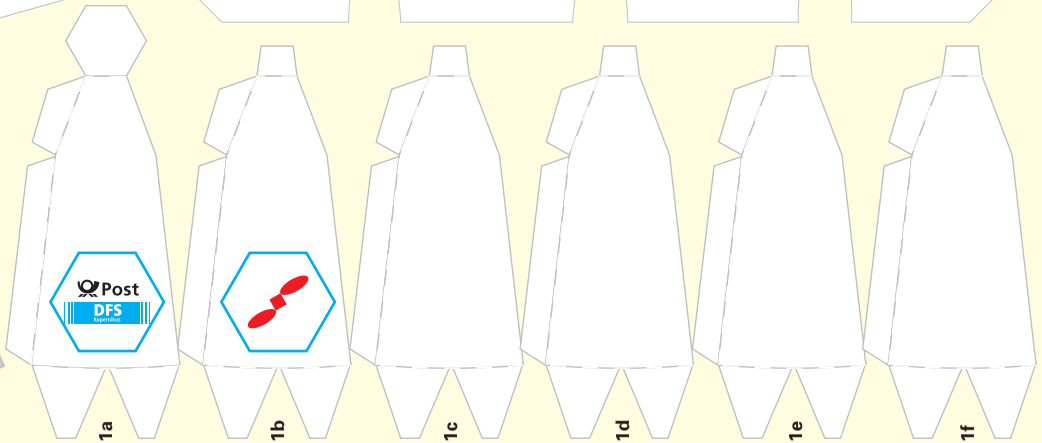
Baden-Württemberg
The German Southwest.
2

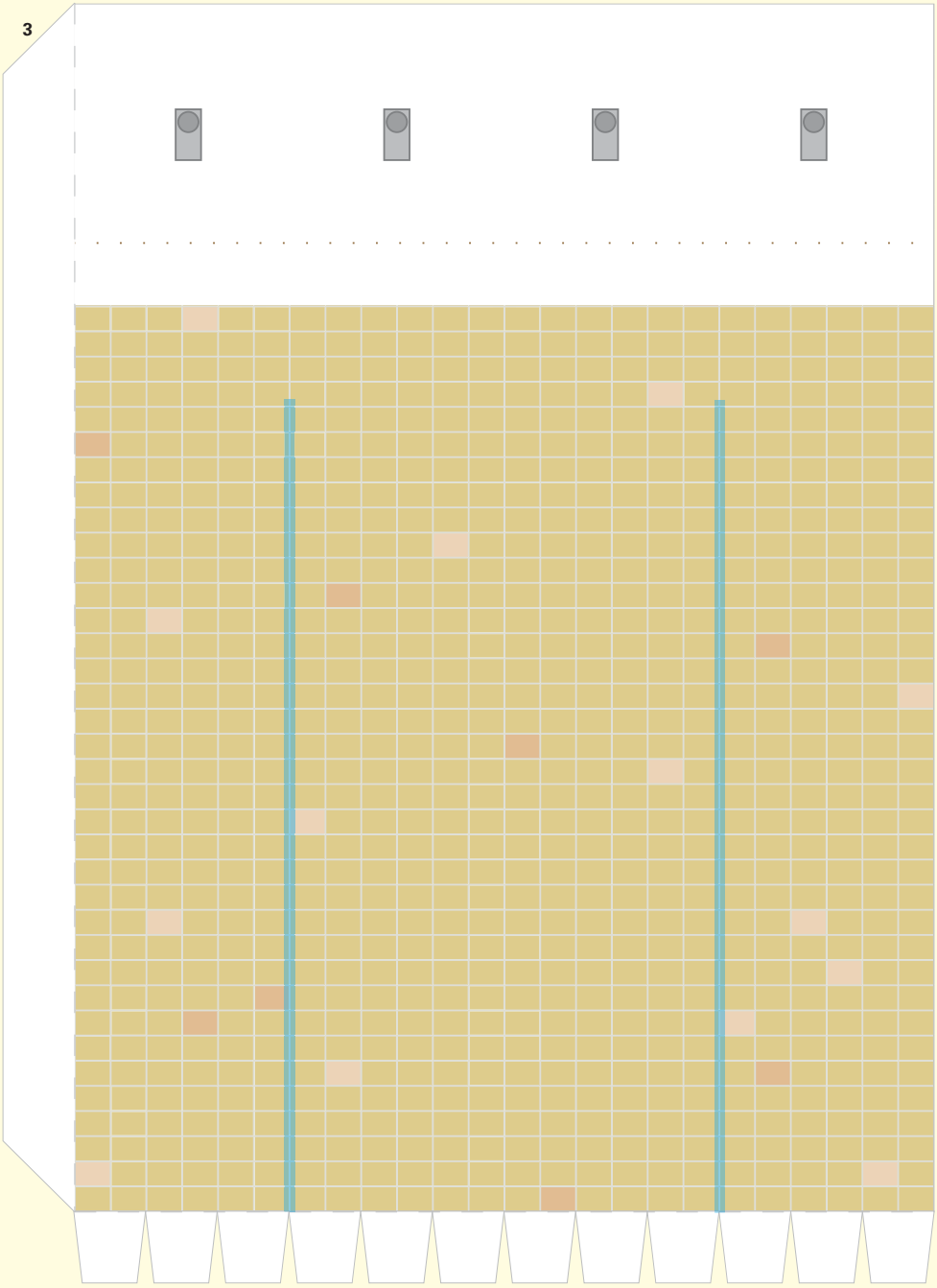

Post
DFS
1a
1b
1c
1d
1e
1f

CUT

FOLD

GLUE

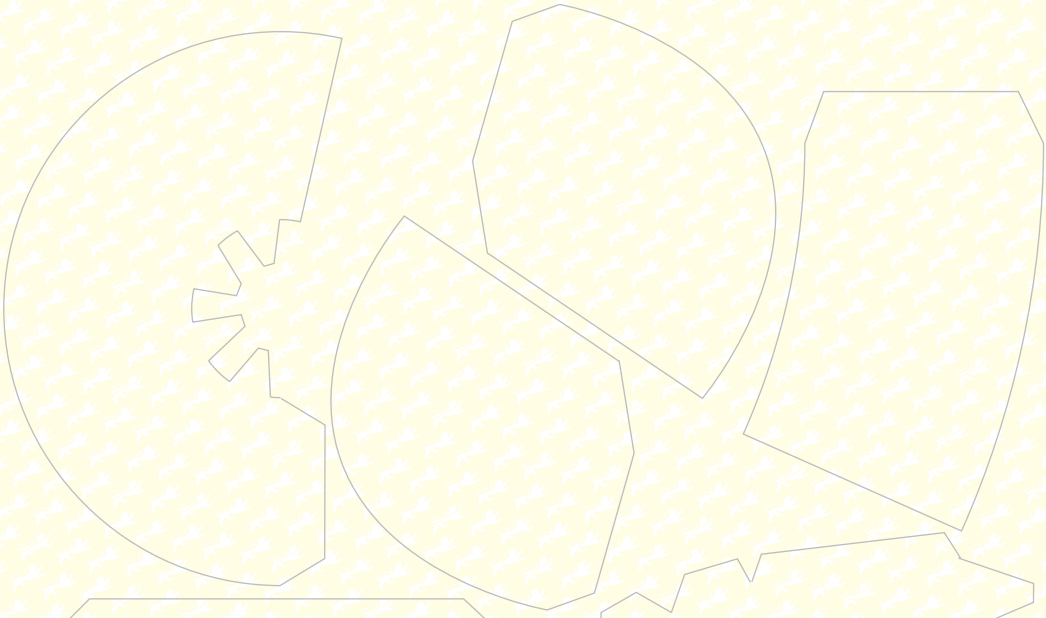
3



Plenty of Payload

RESEARCH UNIVERSITIES	UNIVERSITIES OF APPLIED SCIENCES
AEROSPACE ENGINEERING Stuttgart	
GEODESY Karlsruhe, Stuttgart	
ENGINEERING Karlsruhe, Stuttgart	**ENGINEERING** Aalen, Albstadt-Sigmaringen, Esslingen, Furtwangen, Heilbronn, Karlsruhe, Konstanz, Mannheim, Offenburg, Pforzheim, Ravensburg-Weingarten, Reutlingen, Ulm
MECHATRONICS Karlsruhe	**MECHATRONICS** Aalen, Esslingen, Furtwangen, Heilbronn, Karlsruhe, Konstanz, Offenburg, Ravensburg-Weingarten, Reutlingen, Ulm
ELECTRICAL ENGINEERING Karlsruhe, Stuttgart, Ulm	**ELECTRICAL ENGINEERING / ELECTRONICS** Aalen, Esslingen, Furtwangen, Heilbronn, Konstanz, Mannheim, Offenburg, Ravensburg-Weingarten, Ulm
	ENERGY MANAGEMENT / SUSTAINABLE ENERGY COMPETENCE Biberach, Esslingen, Mannheim, Offenburg, Rottenburg, Stuttgart (HfT), Ulm
MICROSYSTEMS ENGINEERING Freiburg	
MATERIALS SCIENCE Stuttgart	**SURFACE TECHNOLOGY AND MATERIALS SCIENCE** Aalen
CHEMISTRY Freiburg, Heidelberg, Karlsruhe, Konstanz, Stuttgart, Tübingen, Ulm	**APPLIED CHEMISTRY / CHEMICAL ENGINEERING** Aalen, Esslingen, Mannheim
MATHEMATICS Freiburg, Heidelberg, Karlsruhe, Konstanz, Mannheim, Stuttgart, Tübingen, Ulm	**MATHEMATICS** Stuttgart (HfT)
PHYSICS Freiburg, Heidelberg, Karlsruhe, Konstanz, Stuttgart, Tübingen, Ulm	**PHYSICAL ENGINEERING** Ravensburg-Weingarten
COMPUTER SCIENCE Freiburg, Heidelberg, Karlsruhe, Konstanz, Mannheim, Stuttgart, Tübingen, Ulm	**COMPUTER SCIENCE** Aalen, Esslingen, Furtwangen, Heilbronn, Karlsruhe, Konstanz, Mannheim, Offenburg, Pforzheim, Ravensburg-Weingarten, Ulm

This list contains study programmes in Aerospace Engineering as well as in related fields. However, it does not claim to be all-inclusive. For further information on studying in Baden-Württemberg, please consult **www.study-guide-bw.de** which contains a database of all programmes offered in English. For programmes taught in German, please visit **www.studieninfo-bw.de.**



STUTTGART SMALL SATELLITE PROGRAMME

With the Small Satellite Programme of the Universität Stuttgart, engineers of IRS (Institute of Space Systems) intend to design, build and run their own small satellite in the weight class up to 200 kg, in cubical form with about 1 m edge length. The IRS breaks new ground allowing students to participate already during their studies in projects such as the Flying Laptop or the moon satellite BW1.

www.kleinsatelliten.de

THE FLYING OBSERVATORY SOFIA

SOFIA, the Stratospheric Observatory For Infrared Astronomy, was jointly developed by the US National Aeronautics and Space Administration (NASA) and the German Aerospace Center (DLR). It is a modified Boeing 747 SP with a 2.7 m reflecting telescope onboard which is intended to bring new knowledge on the origin of our universe. In a flight altitude of 12 to 14 km, the outer skin of the aircraft is opened so that the scientists can directly receive infrared radiation from the universe which can not be observed from the ground due to the Earth's atmosphere.

www.dsi.uni-stuttgart.de

RESEARCH INSTITUTES
Fraunhofer Institute for Chemical Technology ICT, Pfinztal. **www.ict.fraunhofer.de**
Fraunhofer Institute for Physical Measurement Techniques IPM, Freiburg **www.ipm.fraunhofer.de**
Fraunhofer Institute for High-Speed Dynamics EMI, Freiburg **www.emi.fraunhofer.de**
German Aerospace Center (DLR), facility Stuttgart **www.dlr.de/Stuttgart**
German Aerospace Center (DLR), facility Lampoldshausen **www.dlr.de/Lampoldshausen**
ITV Institute of Textile Technology and Process Engineering, Denkendorf **www.itv-denkendorf.de**

TECHNOLOGY TRANSFER
Technology-Transfer-Centre Lampoldshausen (TTZ) **www.ttz-lampoldshausen.de**
STZ Simulation of Reactive Flows, Heidelberg **www.stw.de/K060/60030/240.htm**
STZ Signal Processing Systems, Pforzheim **www.hs-pforzheim.de/stw-svs**
STZ Aerodynamics, Aircraft and Lightweight Construction, Stuttgart **www.stzafl.de**
STZ Space, Gäufelden **www.tz-raumfahrt.de**
STZ Thermal and Fluid Mechanics, Esslingen **www.stw.de/K060/60030/145.htm**
STZ Plasma- and Space Technology, Stuttgart **www.plasma-raumfahrt.de**

PROJECTS
The Flying Observatory SOFIA **www.dsi.uni-stuttgart.de**
Stuttgart Small Satellite Programme **www.kleinsatelliten.de**

Join us on the web!

www.bw-invest.de

This site contains an overview on the State of Baden-Württemberg as a business location as well as a company database.

www.lrbw.de

The Baden-Württemberg Forum for Aerospace (LRBW e.V.) connects and develops the aerospace cluster in the State.

www.study-guide-bw.de

The StudyGuide contains a wealth of information on educational opportunities, research, life and work in Baden-Württemberg.

Contact us!

info@bw-wfk.de

For further information on our services, visit **www.bw-wfk.de**.

Baden-Württemberg International

bw-i

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Published by:

© Baden-Württemberg International, Stuttgart.

Second edition, September 2007

Graphic Concept and Design:

www.jungkommunikation.de

Photos:

DLR
DLR Lampoldshausen
ESA/CNES/ARIANESPACE

Baden-Württemberg

The German Southwest.