



Looking back to the future – goodbye 2013, hello 2014!

20 December 2013

What has a certain SANDRA to do with a digitally networked sky? And why do we consider a research flight that does not even take off newsworthy? Where exactly does the noise emitted by aircraft come from and how can it be reduced? How does an astronaut prepare for a six-month stay on the International Space Station, ISS? The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) 2013 annual film has the answers.

[//www.youtube.com/embed/mNr9ToNJJlc](http://www.youtube.com/embed/mNr9ToNJJlc)

From the wide variety of projects in 2013, we again chose a few exemplary ones – SANDRA, for instance. Of course it is not a person, but the eponymous flight experiment carried out on DLR's Airbus A320 'D-ATRA' research aircraft. Its acronym 'Seamless Aeronautical Networking through integration of Data links Radios and Antennas' says it all; the goal is to develop an integral aeronautical communication system. And it's true – DLR's research aircraft Dornier 728 is stationed in a hangar and, although it will not take off any time soon, it is still in service for science, or, more explicitly, for cabin design and research. A project called LiKab examines the influence of cabin light on aircraft passengers.

What else? The opening of DLR's 3500-square-metre research laboratory :envihab in Cologne, a 'pressure cooker' for materials of the future, a self-parking car, the CeraStorE competence centre for sustainable energy research, wind tunnel research and much more.

But, as said in the beginning, at DLR we only look back to take a look into the future. One of the highlights of 2014 will be 'Blue Dot', the mission of German European Space Agency astronaut Alexander Gerst. On 28 May 2014, he will lift off for a six-month stay on the International Space Station, ISS. In the video, he explains how he prepares for the mission.

Happy holidays and best wishes for a great 2014!

Contacts

*DLR Web Portal Team
DLR German Aerospace Center
Tel.: +49 2203 601-2116
webportal@dlr.de*

The Ariane 5 ES with ATV-4 'Albert Einstein' against the evening sky from Kourou



On-time lift-off of the fourth space transporter, ATV-4 'Albert Einstein', on 5 June 2013 at 23:52 CEST (18:52 local time) on board an Ariane 5ES launch vehicle from Europe's spaceport in French Guiana, bound for the ISS. DLR staff member Thilo Kranz took this photograph of the luminous Ariane in the evening sky over the Atlantic.

Credit: DLR/Thilo Kranz, CC-BY.

SOFIA at the airport of Christchurch, New Zealand



SOFIA, the Stratospheric Observatory for Infrared Astronomy, has been deployed to a base at Christchurch, New Zealand, for a series of science flights to observe astronomical targets in the southern sky. From 17 July until 2 August 2013, SOFIA will study celestial objects that are uniquely observable on southern flight routes.

Credit: NASA/C. Thomas.

DLR research facility :envihab



The focus of the :envihab research facility, operated by the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR), and its eight modules, spread over 3500 square metres, is on people, their health and their performance levels.

Credit: DLR (CC-BY 3.0).

Touching down on a comet – Philae



Tucked away on board the European spacecraft Rosetta, the lander Philae is flying to the comet 67P/Churyumov-Gerasimenko. This first landing on a comet will enable scientists to conduct never-before accomplished measurements on the comet's surface.

Credit: DLR (CC-BY 3.0).

DLR ATRA research aircraft



The Airbus A320-232 D-ATRA, DLR's largest fleet member, has been in operation since the end of 2008.

Credit: DLR (CC-BY 3.0).

Measuring stations provide data on solar radiation and pollution



DLR researchers at the Plataforma Solar de Almería in southern Spain calibrate measuring stations that will be used for a monitoring network in some North African countries.

Credit: DLR (CC-BY 3.0).

'Blue Dot' – the logo for the ISS mission of the next German ESA astronaut, Alexander Gerst



'Blue Dot – Shaping the Future' is the motto of the ISS mission of the next ESA astronaut, Alexander Gerst. During German Aerospace Day on 22 September 2013, DLR and ESA revealed the mission name and its logo.

Credit: ESA.

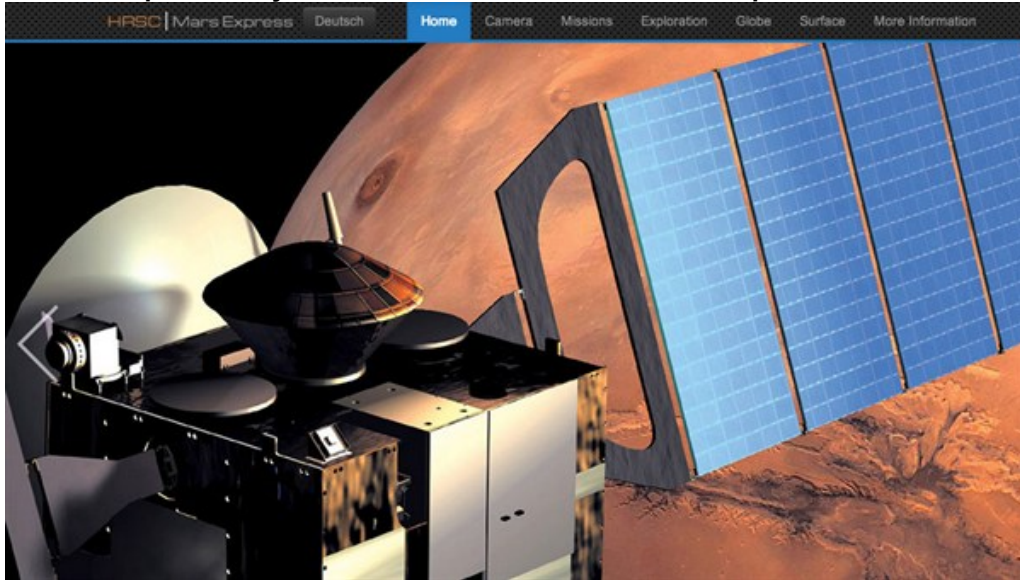
CeraStorE



The new research facility CeraStorE (Ceramics, STORAge, Energy Competence Center for Ceramic Materials and Thermal Storage Technologies in Energy Research) is jointly operated by the DLR Institutes for Materials Research, Solar Research and Technical Thermodynamics.

Credit: DLR (CC-BY 3.0).

DLR Web special: 10 years HRSC camera on board Mars Express



DLR Web special will take you on a trip to our planetary neighbour. See stunning images of its surface; find out more about its climatic history and moons, and about the history of its exploration.

Credit: DLR (CC-BY 3.0).

Soap bubbles for the ISS



How do soap bubbles behave in microgravity? And can they be propelled with sound waves? Ideas for experiments were proposed by the participants of 'Aktion 42', a schools' competition held by the German Aerospace Center (DLR), the European Space Agency (ESA) and the 'Jugend forscht' foundation for young researchers. When German ESA astronaut Alexander Gerst flies to the International Space Station (ISS) in May 2014, he will try to answer these questions.

Credit: iStock.com/dmax-foto.

Direct evaporation in the receiver tube



In the DUKE (Durchlaufkonzept – Entwicklung und Erprobung [Cycle Concept – Development and Testing]) test system, the steam needed to generate electricity is produced directly in the receiver tubes of the parabolic troughs. Intermediate steps employing a heat transfer medium are no longer needed and higher operating temperatures are possible.

Credit: DLR (CC-BY 3.0).

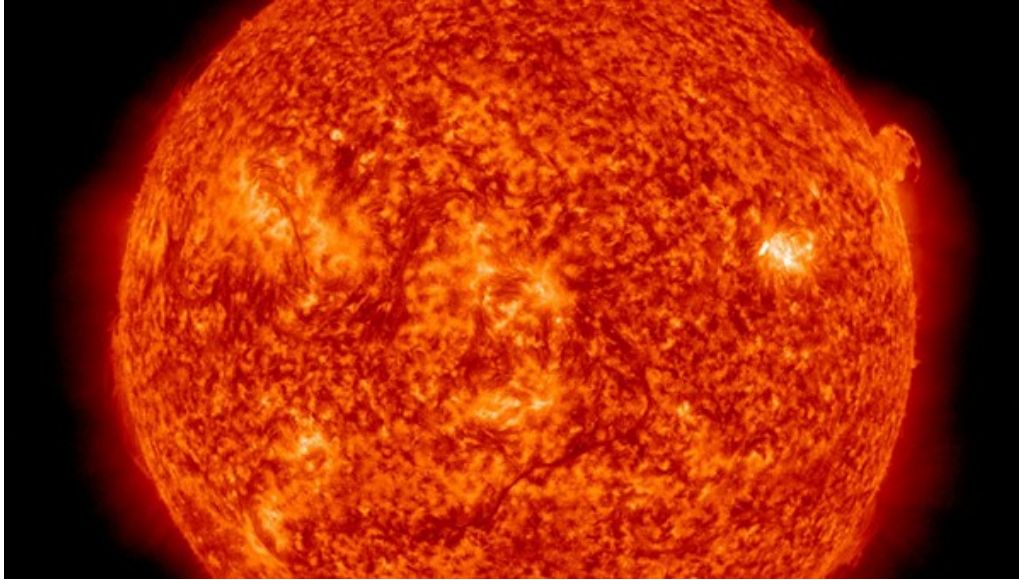
Homemade aircraft



Girls' Day was held on 25 April 2013 in seven DLR locations. In the student workshop of the Göttingen DLR_School_Lab, the pupils learned, for example, how to build a model airplane.

Credit: DLR (CC-BY 3.0).

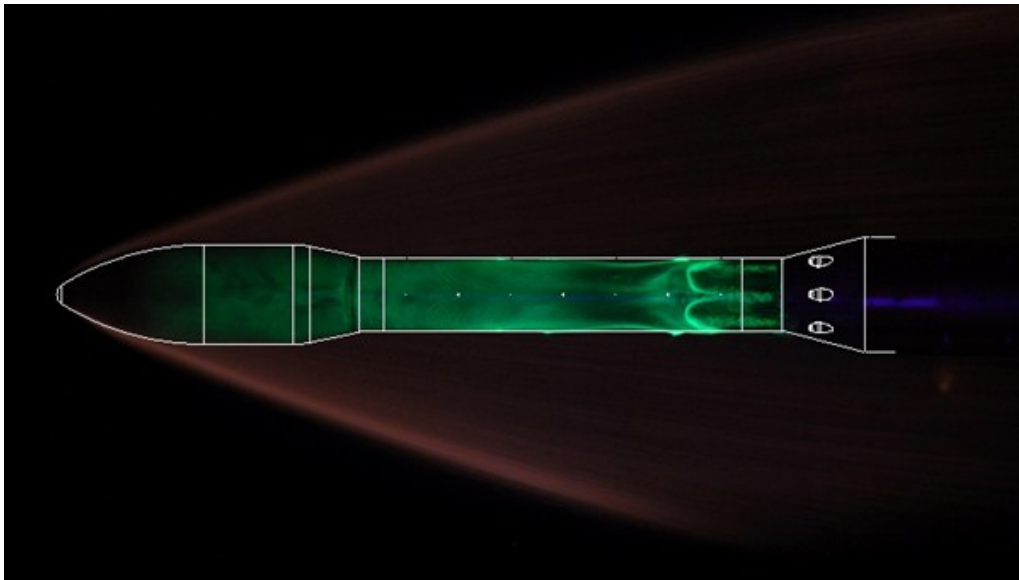
Active Sun



The Sun goes through a natural cycle, in which, as is the case in 2013, it is particularly active approximately every 11 years.

Credit: SDO/AIA.

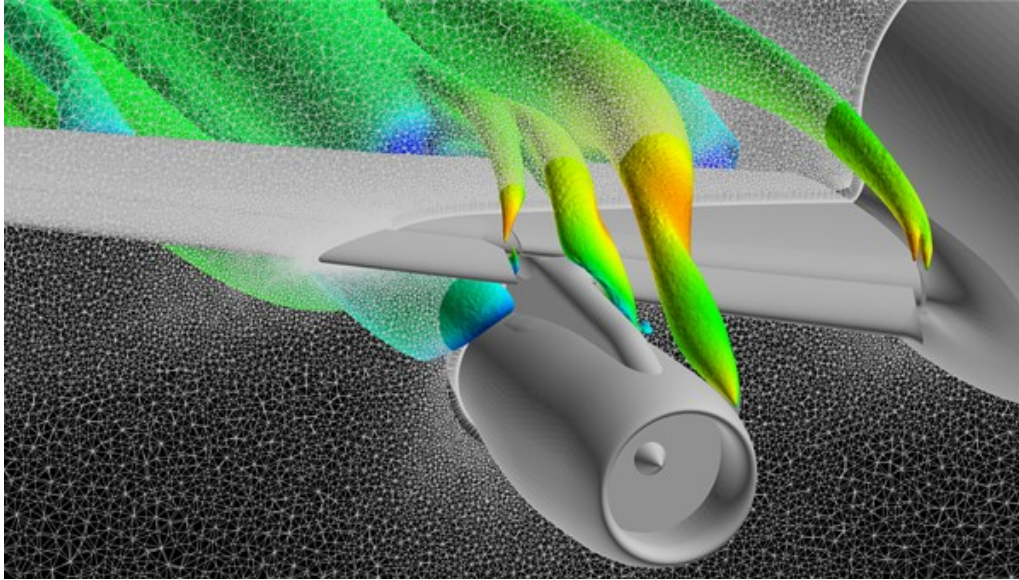
Film of oil makes airflow visible



To record the change in air flow, renowned scientists conducted tests on a model of the Vega rocket in the wind tunnel at DLR in Cologne in June 2013. The images show the distribution of the oil particles during the different experimental conditions.

Credit: DLR (CC-BY 3.0).

Topic of the DLR Magazine - developing the new generation aircraft



The December 2013 issue of the DLR magazine is full of exciting stories, reviews & reports. The tablet edition for Android and iOS also offers multimedia, with videos, animations and audio!

Credit: DLR (CC-BY 3.0).

German ESA astronaut Alexander Gerst



In May 2014, German astronaut Alexander Gerst will be launched on his first mission to the International Space Station.

Credit: ESA.

Rotor blades get smart



Rotor blade trailing edges with the ability to change their shape and slats that divert wind when required – very large rotor blades equipped with such mechanisms can systematically adapt to gusts and reduce performance fluctuations. As a result susceptibility to damage can be reduced and longer service life achieved.

Credit: Rainer Sturm/ pixelio.de.

Display in FASCar I



The parking sign on the vehicle's display signals an available parking place.

Credit: DLR (CC-BY 3.0).

The Jupiter Mission JUICE



Artist's impression of the JUICE Mission (JUperiter ICy moons Explorer) to Jupiter and its 67 moons. JUICE is scheduled to launch in 2022, and DLR is involved in the mission. The mission focuses on the planet itself, as well as three of its moons, Ganymede, Callisto and Europa. Scientists believe that oceans of water are present beneath the thick ice on their surfaces – and it is even conceivable that life, as we know it, may have evolved here. Arrival at Jupiter is scheduled for 2030. After a three-year observation period, JUICE is scheduled to complete its mission in 2033.

Credit: ESA/AOES.

HALO fly-over



HALO fly-over: At 22 metres high, HALO flies over the experiment. In the smoke, the two wake vortices are visible.

Credit: DLR (CC-BY 3.0).

Removal of Omegahab system



Removal of the Omegahab system from the BION capsule by the Russian retrieval team. For the first time during a BION mission, the scientists could see the samples. By 10:35 local time, the German researchers had Omegahab back.

Credit: Reinhard Hilbig/Universität Hohenheim.

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