



A satellite view of the oceans

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DLR sets up Research Centre for Maritime Safety in Bremen

Gazing down from space, satellites have the best view of ice floes drifting, waves swelling restlessly, currents moving dangerously, the spread of oil slicks and the changing positions of ships. For this reason, researchers at the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) analyse radar images or use satellites to receive ship signals. Now, DLR is pooling the research work conducted at its Remote Sensing Technology Institute and the Institute for Space Systems within the Research Centre for Maritime Safety in Bremen. DLR has set up additional research centres devoted to security on the oceans in Braunschweig, Neustrelitz and Oberpfaffenhofen.

"DLR is focusing its scientific expertise within the research association Maritime Safety, meaning that the situation on the oceans can be depicted comprehensively and practically in real time," says Chairman of the DLR Executive Board Johann-Dietrich Wörner. "The results can also improve security in regions close to the coastline." Radar images from the German satellite TerraSAR-X are of utmost importance for the Bremen-based research centre, as its radar signals are able to record Earth's surface from an altitude of over 500 kilometres, irrespective of the time of day or cloud cover. The products that DLR scientists create using the high-resolution data gathered in this way allow them to draw conclusions on the swell or wind fields out at sea. Analysis of the satellite data also enables mapping of the underwater topography. As such, data from the radar satellites is frequently combined with optical satellite images to provide users, such as government agencies and commercial enterprises, with comprehensive information.

The satellite AISat is another project within the research association Maritime Safety: the Institute for Space Systems in Bremen is developing a nano-satellite fitted with a special antenna to receive AIS signals from ships. What makes the project stand out is the use of a four-metre helix antenna able to receive transponder signals in sea rescue operations, in addition to those of commercial and non-commercial ships. The satellite is scheduled for launch at the end of 2013.

The research results is used to investigate questions of security concerning maritime routes, coastlines and ports. Applications include the prevention of ship collisions, monitoring the movement of icebergs and even the tracking of hijacked vessels or the detection of illegal activities such as dumping of oil or hazardous waste.

Among other sources, funding for the work comes from the German Federal Ministry of Economics and Technology (BMWi) and the German states of Bavaria, Bremen, Lower Saxony and Mecklenburg-Western Pomerania.

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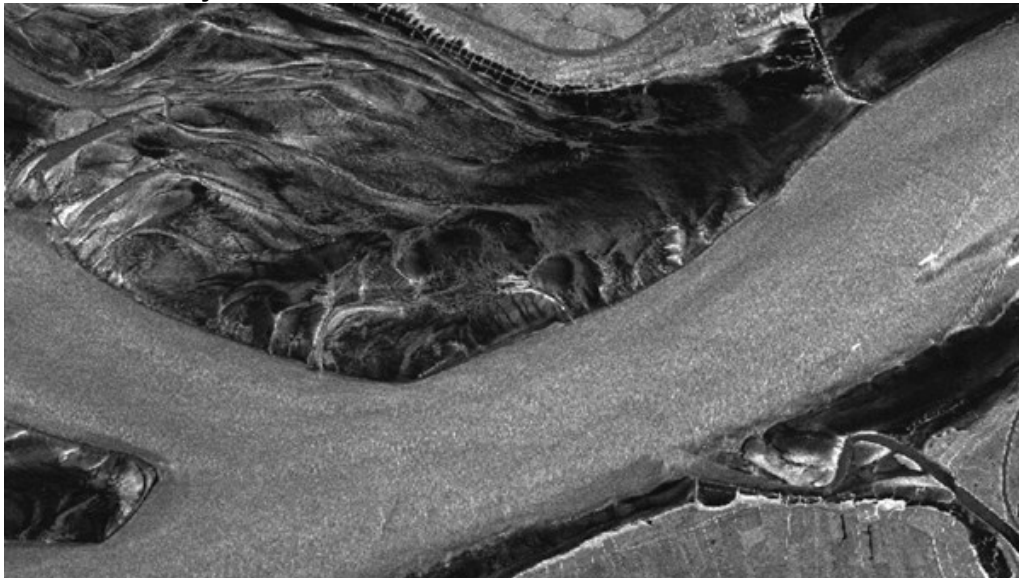
A view from space



The German radar satellite TerraSAR-X gazes down on Earth unaffected by cloud cover or time of day. Scientists at the German Aerospace Center (DLR) use the images to identify ocean swell and wind strength, for example.

Credit: DLR.

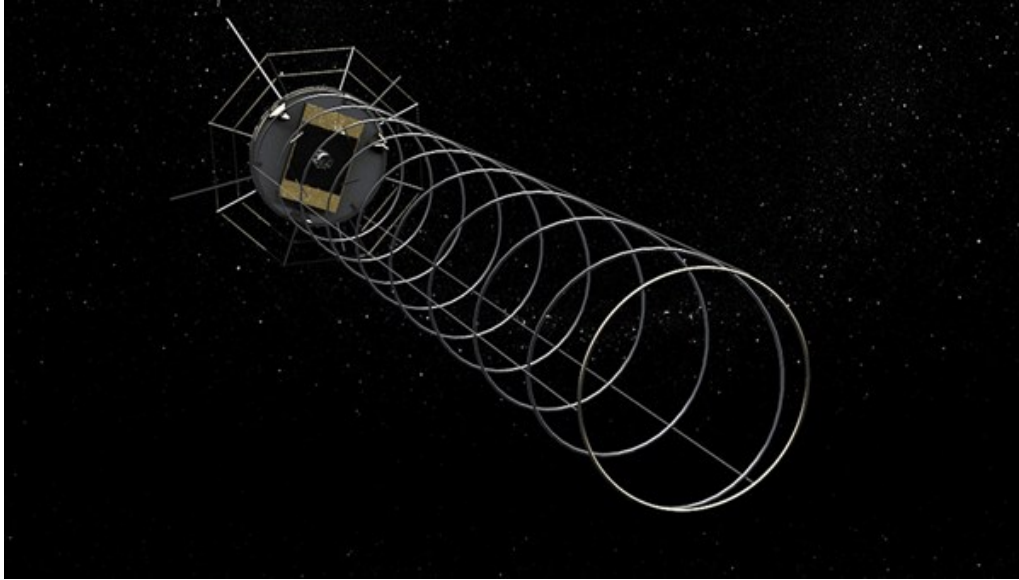
The Elbe estuary



Scientists at the German Aerospace Center (DLR) use radar images from the satellite TerraSAR-X to draw conclusions on the structure of the Elbe estuary.

Credit: DLR.

Ship detection from space: AISat



In the future, the satellite AISat will use its 4-metre helix antenna to receive ship signals from the numerous vessels travelling along busy routes.

Credit: DLR (CC-BY 3.0).

Opening of the Research Centre for Maritime Safety



At the opening of the Research Centre for Maritime Security: from left to right, Richard Bamler (DLR Remote Sensing Technology Institute), Hansjörg Dittus (DLR Executive Board Member for Space), State Councillor Heiner Heseler, Susanne Lehner (Director of the Research Centre for Maritime Security), Member of the German Parliament Torsten Staffeldt, Chairman of the DLR Executive Board Johann-Dietrich Wörner, Dennis Göge (Program Coordinator Defence & Security Research at DLR).

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