



---

## Logistics expert for science – rocket engineer Wolfgang Jung

*17 November 2011*

The Arctic, Antarctic, Australian outback or Brazil: Wolfgang Jung spends several months a year in the most remote places on Earth to prepare and launch sounding rockets – also known as rocket probes – into space. The aerospace engineer has been working at the German Aerospace Center's (Deutsches Zentrum für Luft- und Raumfahrt; DLR) Mobile Rocket Base (MORABA) in Oberpfaffenhofen since 1996. This is the nineteenth in our series of DLR portraits.

### **Living in and out of a container**

Worldwide operations, knowledge of foreign languages and the ability to build a functioning rocket launch system from scratch in extreme cases – anyone working at MORABA must be a savvy globetrotter and have great organisational skills. "If you're lucky, the launch site has a flat surface," Wolfgang Jung jokes, laughing. The 43-year-old manages the 'Launch Services' group at MORABA, part of DLR's Space Operations and Astronaut Training Department. "Our job is to take scientific experiments to a specific place, at a specific time, under specific conditions, and at a specific speed," says the Rhineland native.

### **Climate and heat shield experiments**

The rockets carry scientific experiments in biology, material sciences or physics on board, which are carried out at altitudes from 50 to 1500 kilometres. At these heights, the rockets can almost experience weightlessness. In addition, the sounding rockets can be used to study the climate; for example, the composition of the atmosphere. Sounding rockets are also suitable as experimental platforms for hypersonic technologies. "We can, for example, test new shapes and materials for thermal protection systems," Wolfgang Jung explains. These play a key role during the re-entry of spacecraft into Earth's atmosphere.

Jung and his colleagues also ensure that the samples return to the ground without damage and in the desired location. The scientists involved in the experiments can then analyse the results. In his 15 years at the Mobile Rocket Base, Jung has organised and supported 75 campaigns and is still as enthusiastic as on the first day: "For an aerospace engineer, this is the land of plenty."

### **North and South Pole in a week**

The engineer will never forget two deployments in January 1998; he installed rocket stations for experiments within the Antarctic and Arctic circles in a single week. "First, we launched several meteorological rockets from Rothera Point, Adelaide Island, located on the Antarctic peninsula, and which is about 300 to 400 metres long and 200 metres wide. They flew to an altitude of 110 kilometres; the solid-fuel motors burned for just 2.5 seconds before the payload carriers containing the experiments opened, allowing a balloon to separate and inflate. During the subsequent free fall of the balloon, we measured the trajectory using radar so the scientists could calculate pressure, temperature and density of the atmosphere," the engineer recalls. The atmospheric models derived from this allows the scientists, who work closely with the MORABA engineers on each campaign, to, for example, determine and study differences between the northern and southern hemisphere. From Adelaide Island he headed straight for the Esrange Space Center in Kiruna, northern Sweden. "There, at a temperature of minus 40 degrees Celsius, I learnt to appreciate the thermal overalls," Jung recalls.

### **SHEFEX**

As part of the SHEFEX programme (SHarp Edge Flight EXperiment), DLR is studying thermal protection concepts for spacecraft which have to endure temperatures of up to 2000 degrees Celsius. The SHEFEX II rocket is due to be launched from the Andøya rocket range in northern Norway in the spring of 2012 – Wolfgang Jung from the Mobile Rocket Base and his team will run this campaign as well.

### **REXUS/BEXUS**

The regular projects of DLR's Mobile Rocket Base include the rocket and balloon launches for the REXUS/BEXUS student experiments. Here, students familiarise themselves with the complete development of an aerospace project, starting with the idea and planning and ending with the publication of the results. In this project, they build and test the equipment for the experiment, actively participate in the balloon and rocket launch campaign, carry out the experiments during the flight and analyse the data acquired. The project duration for a REXUS experiment is about 18 months, and for a BEXUS experiment about 12 months.

### **TEXUS**

TEXUS is the most successful and longest-running rocket programme for scientific experiments and technology testing under microgravity conditions in the world; it has been in existence since 1976. On average, one campaign takes place each year. TEXUS also plays an important role in the preparation of experiments intended for the International Space Station.

### **Technical know-how, team spirit and creativity**

The family man spends three to four months of each year abroad. The conditions at the ranges vary; sometimes Jung and his colleagues really do have to take all their equipment with them – from the diesel generator to the mobile radar or telemetry station. It also includes the launch pad which, broken down into five segments, fills three giant containers that can weigh up to 15 tons. That is why the base in Oberpfaffenhofen also includes a large test laboratory and warehouse. Here, alongside individual parts for rockets and payload segments, there are stacks of numerous aluminium boxes of various sizes. There is also room for personal possessions. "During the campaigns, we mostly live in buildings at the launch sites and look after ourselves," Jung says – team spirit and creativity are particularly necessary. "You have to get on well with one another at a personal level and be inventive if you want to avoid 'cabin fever' on those long winter evenings in Lapland."

Without working sounding rockets, the experiments will not succeed. "We are the logistics experts for the scientists. Like an archer, we align the launch pad in such a way that the rocket, which is unguided, flies along the correct path – for microgravity experiments that must, for example, be a specific parabola," the expert says. The rockets are not just exposed to wind and weather, they also rotate around their longitudinal axis during flight. This rotation keeps the probe stable so that the chosen landing site is reached as planned.

### **Cross-cultural sensitivity**

Cross-cultural sensitivity is also necessary: "When I went to Brazil for the first time in 1997, I thought I was in a third world country. The launch base is located in one of the poorest regions of the country; there was no consistent power supply, little infrastructure and I was barely able to make myself understood," Jung recounts. On his return he learned Portuguese – and Swedish. English is an absolute must, French is also an advantage.

## Building contractor or rocket specialist?

Wolfgang Jung could have taken over his father's construction business, but instead of 'civil engineering' he was more interested in rocket technology. Before studying aerospace engineering at Aachen, he served as a reserve officer in a rocket artillery battalion of the German army for two years. In 1994 he came to DLR to write his diploma dissertation at the Microgravity User Support Center in Cologne on the topic of 'Power and Data Connections Between a Landing Station and a Mars Rover'. Wolfgang Jung has remained true to spaceflight. In 2010 he went on to obtain his Master of Space Systems Engineering in Delft, the Netherlands. After 15 years of pure practice, university and exchanges with international colleagues beckoned once again. "That was a great year, with visits to the ESA sites in the Netherlands, France and Italy as well as Lindau, on Lake Constance, and DLR Oberpfaffenhofen."

---

## Contacts

*Elisabeth Mittelbach*  
*German Aerospace Center (DLR)*  
*Communications, Space Administration*  
*Tel.: +49 228 447-385*  
*Fax: +49 228 447-386*  
*Elisabeth.Mittelbach@dlr.de*

*Dipl.-Ing. Wolfgang Jung*  
*German Aerospace Center (DLR)*  
*Space Operations and Astronaut Training, Mobile Rocket Base (MORABA)*  
*Tel.: +49 8153 28-2724*  
*Fax: +49 8153 28-1344*  
*Wolfgang.Jung@dlr.de*

---

## Wolfgang Jung in front of the SHEFEX II rocket



Wolfgang Jung and his colleagues will also supervise the SHEFEX II (SHarp Edge Flight EXperiment) campaign that will launch from the Andøya rocket range in northern Norway in the spring of 2012. In the SHEFEX programme, DLR is studying thermal protection concepts for spacecraft that have to endure temperatures of up to 2000 degrees Celsius.

Credit: DLR.

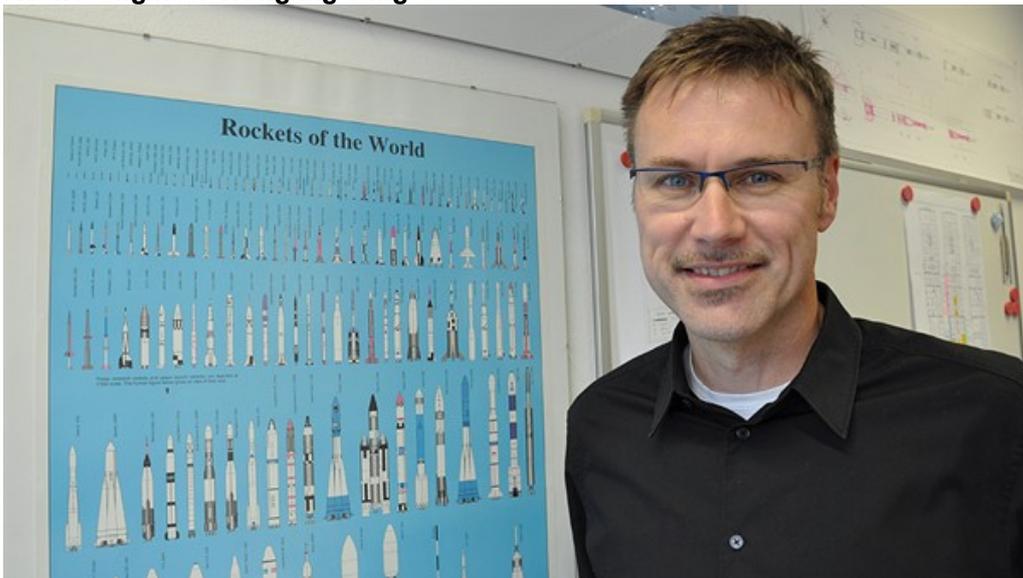
### Engine inspection – no cracks in the propellant?



To make sure nothing goes wrong, each propellant assembly of the sounding rockets is visually inspected for possible cracks. In this image Wolfgang Jung inspects the engine of the VSB-30 rocket for the TEXUS 43 mission, launched in May 2006 from Kiruna, in northern Sweden.

Credit: DLR.

### Rocket engineer Wolfgang Jung



Rocket engineer Wolfgang Jung in his office at the DLR Mobile Rocket Base in Oberpfaffenhofen.

Credit: DLR.

## Recovery of a rocket payload



After the flight, the recovery mission – Wolfgang Jung (second from right) and colleagues recover a portion of the payload of a MAPHEUS rocket. The rocket component is flown back to the launch site in a helicopter. The rocket lifted off from the Esrange Space Center in northern Sweden on 22 May 2009.

Credit: DLR.

---

*Contact details for image and video enquiries as well as information regarding DLR's terms of use can be found on the DLR portal imprint.*