Lunar Symposium in Berlin – Interview with DLR planetary scientist Ralf Jaumann

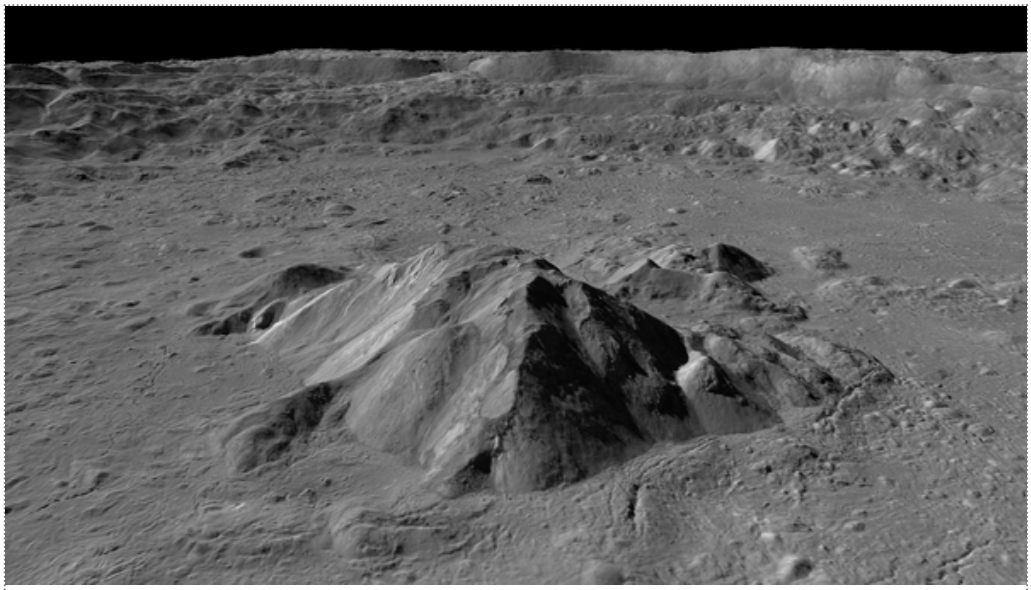
18 April 2012

On 19 and 20 April, 170 international experts met to discuss present and future lunar research

The Moon continues to be a fascinating research objective for scientists from around the world. The DLR Institute of Planetary Research collaborated with NASA's Lunar Science Institute to hold a two-day Lunar Symposium, which took place on 19 and 20 April 2012 at the Adlershof Forum in Berlin. 170 participants, primarily from Europe, the United States, Japan and Russia, exchanged the latest scientific insights gained about Earth's natural satellite. In a brief interview, Ralf Jaumann, Head of the Planetary Geology Department at the DLR Institute of Planetary Research, tells us what this European summit meeting of Moon researchers was all about.

Why did DLR and four other partners convene this Lunar Symposium?

A great deal has occurred in the field of lunar research in the last three years. Since the two latest lunar missions, Chandrayaan-1, India's first Moon mission in 2008, and NASA's Lunar Reconnaissance Orbiter (LRO) that launched in 2009, our view of the Moon has been turned upside down. Before these missions, we thought that Earth's celestial companion was extremely dry, but now we are aware that it contains water. Even if it only exists in small amounts, this is quite sensational news. We have found water at the south pole, in what are known as 'cold sinks'. These are very deep impact craters, into which light never penetrates, and which therefore never experience heating. Furthermore, water can arise on the surface of the Moon as a result of the reaction between hydrogen protons from solar wind and the oxygen in lunar rock. Indeed, thanks to modern research methods, we have also been able to discover water in the rock samples brought back to Earth by the Apollo missions. Consequently, the theory of a 'dry Moon' is no longer a tenable one, and it opens up new questions regarding the origin of our satellite. The Moon is particularly fascinating for me because it is the only celestial object that we are able to observe with the naked eye, and also because it has a direct influence in our life, for example through the monthly calendar and the ocean tides.



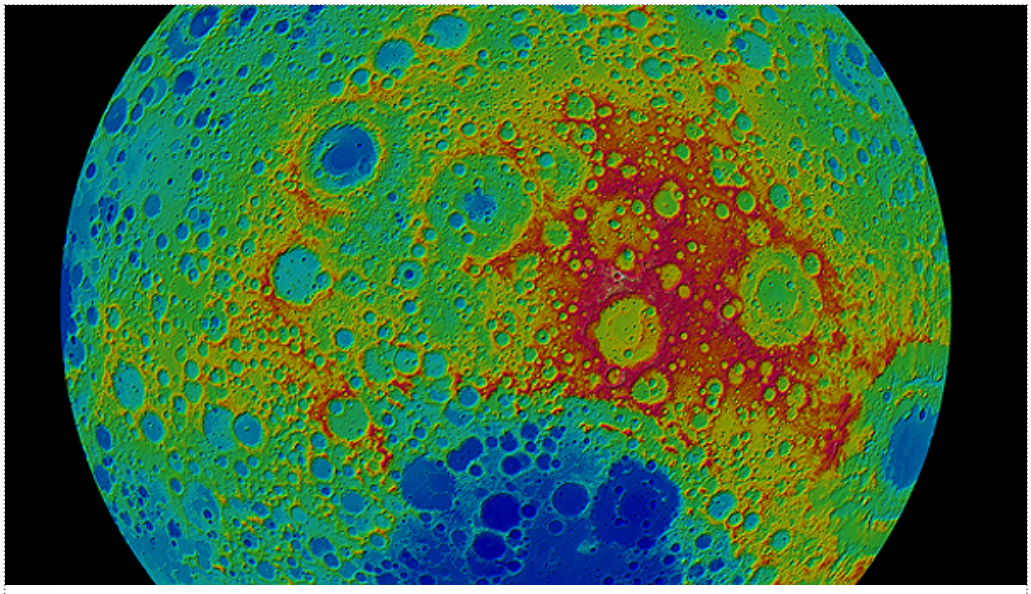
Central peak in the Tycho crater. Credit: JAXA/SELENE.

What were the objectives of this symposium?

We wanted to exchange views at a European and at an international level on where science stands at present, and the implications for the future of lunar research. As our natural satellite, the Moon is extremely important for us; for example, it stabilises the Earth's rotational axis. Also, we know that it is relatively easy to get to the Moon. Scientifically, but also from a technological viewpoint, that constitutes a very exciting and appealing challenge. Furthermore, the Moon is incredibly ancient and its surface shows traces dating back almost to the origin of the Solar System. Another task is to document the appearance of the Moon in the present day because, and of this I am certain, in 100 years, the Moon will not look the same as it has over the last four billion years.

What is DLR's role in lunar research?

We are, and have been, involved in various Moon missions. The Institute of Planetary Research has tremendous geological and geodetic experience in the exploration of planetary bodies. We need this for the exploration and analysis of the Moon. Over the last year, using the latest available data, we have computed the best ever topographical model of its surface. Furthermore, DLR has great expertise in the field of robotics. To explore the Moon, we need more than just spacecraft. We also need to be able to effect a landing in challenging terrain and have the capacity to effect autonomous mobility on location, including provision of the necessary power supply. The Moon has a very long night, lasting 14 days. We therefore need, not only to develop the energy storage technologies capable of functioning in this unforgiving environment, but also to devise appropriate construction materials.



Topography of the far side of the Moon. Credit: NASA/GSFC/ASU/DLR.

There are scientific as well as commercial reasons for exploring the Moon...

Yes. But it is now more important than ever to conduct our scientific work within reasonable cost constraints. We have to ask ourselves what challenges we will be faced with after the era of the International Space Station, the ISS, is over. For me, as a lunar researcher, the Moon is the next logical step to take in the intensive exploration of Earth's immediate vicinity (laughter). After all, it is only two days away. If we genuinely wish to embark on manned missions to the Moon once again, and perhaps even stay there for an extended period of time, we first need to understand more about it. In particular, the question of water is and remains a crucial one. The 2018 Lunar Lander mission being planned by ESA is to land at the Moon's south pole. This would, in my view, constitute an important scientific step forward. The Moon is a good testing ground for space technologies and for basic research in the natural sciences, especially in regard to finding answers to questions about the history of the young Earth, and about the development of life on our planet.

This interview was conducted by Elisabeth Mittelbach

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Animation: Flight over the lunar surface

This animation, partly in true colour and also using false colours to reveal the topography, is based on image data from NASA's Lunar Reconnaissance Orbiter and a global topographic model of the Moon's surface computed by DLR.

Credit: NASA/GSFC/ASU.

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