

Under the Open Sky

“Images of Science” now also in Bremen



In front of “Universum Bremen,” the Hanseatic city’s science museum, visitors are treated to an impression of the research conducted at Max Planck Institutes.

No doubt about it – few things are more likely to attract attention than spectacular images. The exhibition “Im-

ages of Science” exploits this phenomenon. With surprising, aesthetic pictures in a large format, it offers unusual,

easy access to the research conducted at Max Planck Institutes. The exhibition comprises a total of 50 motifs that are regularly updated and supplemented by new ones. The images can be viewed in their entirety online at any time, as well as in changing compilations in various locations around the world. In Germany, too, “Images of Science” continues to enjoy great popularity. Every year, the exhibition in Munich attracts more than one and a half thousand visitors on a single evening during the “Long Night of the Museums” event. The latest addition consists of an open-air show. High up in the north of Germany, visitors have been treated to ten pictures outside the “Universum Bremen” Science Center since July. Visitors who like the pictures can use the QR code to instantly log onto the online exhibition on the Max Planck Society’s website.

 www.images.mpg.de

The Senses of Life

Martin Wikelski and Bonnie Bassler presented with Max Planck Research Award

The question of how organisms perceive their environment is the focus of this year’s Max Planck Research Award. Yet the two prizewinners are studying living organisms that couldn’t be more different: while Martin Wikelski, Director at the Max Planck Institute for Ornithology, observes the sensory powers of animals in their natural habitat, Bonnie L. Bassler from Princeton University and the Howard Hughes Medical Institute works with bacteria. The American played a decisive part in the discovery that even the smallest creatures communicate with each other via signaling substances and then act collectively. Martin Wikelski is exploring the question of how different vertebrates perceive their environment and adapt to it. Above all, he has gained valuable insight into how animals navigate and find their destination on trips that sometimes cover thousands



Bonnie Bassler and Martin Wikelski investigate how different creatures perceive their environment.

of kilometers. Using the satellite-based observation system Icarus, he is a pioneer in the field of wild animal telemetry. The Max Planck Research Award, which is endowed with 750,000 euros, is funded by the German Federal Ministry of Education and Research and bestowed by the Alexander von Humboldt Foundation and the Max Planck Society.

“Actually, we would have liked to carry on!”

Holger Sierks from the Max Planck Institute for Solar System Research on the end of the Rosetta mission

The space probe Rosetta landed on the surface of the comet 67P/Churyumov-Gerasimenko on September 30, bringing to an end one of the most exciting projects in the history of European space exploration. Holger Sierks from the Max Planck Institute for Solar System Research in Göttingen managed the consortium for the Osiris camera system to which the science world and the public owe a debt of gratitude for the spectacular images of the comet's core.

Mr. Sierks, the Rosetta cometary mission has come to an end. Doesn't this make you feel a little sad?

Holger Sierks: The mission lasted around 30 years: starting with the orientation phase at the scientific level, then the planning and construction phase, and finally the travel time to the target comet. During the past two and a half years, Rosetta has accompanied the comet at a close distance. The end was very emotional for everyone involved. Only a very small number of colleagues remain from the pioneering phase; I myself came on board 20 years ago. Rosetta is thus a good example of intergenerational work in space research. What's more, the space probe still functioned perfectly right up to the end. Actually, we would have liked to carry on!

But would that have been possible?

The alternative would have been to put the probe into hibernation again and to reactivate it after the comet had reached its furthest point away from the Sun. But then the fuel wouldn't have been sufficient for the comet to re-approach the Sun and observe the next cycle of activity. That's why we decided to land the space probe on the comet now.

What was the most interesting aspect of the mission for you personally?

I was moved most by the discussion about the origin of the comet. We hope to gain some insight into what the solar system looked like during the first few million years. The cometary nucleus we see today is thought to have formed from two smaller ones. In the gas phase of the accretion disk around the young Sun, these nuclei



“The end was very emotional for everyone involved”: Holger Sierks, scientist at the Max Planck Institute for Solar System Research

decelerated and collided with each other at very low speed.

What I also found exciting are the cylindrical sinkholes, where we look down from the surface almost 200 meters into the inner structure of the comet – and that on a cometary nucleus with a radius of just 1,000 or 2,000 meters! Although the material there has certainly been processed somewhat by solar radiation, we look into the depths of the comet and thus perhaps back into its 4.5-billion-year history. And the inner walls of these sinkholes aren't smooth and homogeneous – they have very sharply defined structures on the scale of two to three meters resembling oranges in a crate.

So there is still a lot of data waiting to be evaluated. How long do you think you and your colleagues will be busy with that?

Collaborations from the Giotto mission that flew past Halley's comet 30 years ago are still ongoing today. I assume that we'll need 20 or 30 years for Rosetta, as well. What I mean here is not just the analysis of the Osiris image data, but also the global analysis of the spectrometer data, the thermal, millimeter and sub-millimeter data on the near-surface structures from Miro and the other instruments aboard

the space probe. As far as the Osiris images are concerned, we initially have three years to compile a comprehensive archive. This procedure is new in the research community and also for the European Space Agency. This work is normally completed when the data is handed over after 12 months. We will calibrate the images, develop mosaics and terrain models and then make the products available to the public and the scientific community.

Your bottom line at the end of the mission?

In 2014, Rosetta managed to appear on the front cover of *SCIENCE* with the caption “Breakthrough of the Year.” I believe the mission must indeed be classified as a breakthrough in cometary research.

What is the next step in cometary research after Rosetta?

I think the scientific community agrees that the next step has to be to bring cometary material to Earth and analyze it in laboratories here – especially the organic components. We are already considering how we would design such a sample-return mission. Interview: Felicitas Mokler

 Dossier on the subject:
www.mpg.de/8310003/rosetta_mission

Understanding Animal Research

Alliance of scientific organizations launches information initiative

The subject of animal research frequently stirs strong emotions, but many areas of basic research simply can't do without examinations using animals. They are the only way to understand complex processes in organisms; they are the starting point for new scientific insights and the drivers of progress in medicine. Against this background, the Alliance of Science Organisations in Germany, of which the Max Planck Society is also a member, has launched its "*Tierversuche verstehen*" (Understanding Animal Research) initiative. The aim is to provide the public and the media with comprehensive, up-to-date facts on animal research. The most important building block in this process is an internet platform that will provide news

and background articles, films, infographics and an image database, as well as offering an opportunity for discussion. Journalists will be able to establish contact with experts, and schoolchildren and teachers can find information for their lessons. The objective is to make the debate on the necessity and benefits of animal research and the alternatives to it more objective. The initiative is also actively engaged in social media. Starting at the end of this year, "*Tierversuche verstehen*" also plans to host presentations and discussion forums at public events.

 www.tierversuche-verstehen.de
(available only in German)



Well Founded

Max Planck Foundation celebrates its anniversary

The Max Planck Foundation, an independent institution, has been supporting the work of Max Planck scientists for ten years. In that time, the income from the Foundation capital has provided more than 45 million euros in funding for around 30 projects, such as the second flight of Sunrise, the largest flying solar telescope, and the initiative behind the Center for Systems Biology in Dresden. The additional private funds offer fast, flexible leeway where public funds are not available. A further focus of the support consists in securing the working conditions for outstanding researchers, particularly for recruiting them to a Max Planck Institute or retaining them there.

Photo: TVVde



MAX-PLANCK-GESellschaft

Thank you.

10 years of facilitating ideas
10 years of outstanding commitment
10 years of Max Planck Foundation

For ten years now, the Max Planck Foundation has been encouraging and funding our knowledge pioneers to explore frontiers in science. We would like to express our heartfelt thanks to all our contributors and supporters, in particular the founders Stefan von Holtzbrinck and Reinhard Pöllath.


Martin Stratmann, President of the Max Planck Society



www.maxplanckfoundation.org

Double Career Launch

The Max Planck Society and the Technical University of Munich (TUM) jointly appoint top young scientists

The opportunity to pursue one's own research ideas, gain access to first-rate lab equipment and exchange ideas with experienced colleagues across disciplines: these are the characterizing features of the new collaboration model between the Max Planck Society and the Technical University of Munich (TUM). The concept: Young scientists who were selected from an international pool of applicants to lead a Max Planck Research Group receive an additional appointment to a fixed-term tenure track professorship from the TUM. This gives the young scientists reliable prospects for their future career development. An evaluation after six years determines whether they will research and teach at TUM on a permanent basis – initially as an Associate Professor with a W3 salary and linked to an option for further promotion to Full Professor. According to Max Planck President Martin Stratmann, the offer is the only one of its kind in the world: “The new collaboration is a real win for Germany as a science location in the global competition for outstanding junior scientists.” The two institutions jointly appointed their first seven junior talents in October, some from such renowned institutions as the University of California, Berkeley.



Common objective: Wolfgang Herrmann, President of the Technical University of Munich, and Max Planck President Martin Stratmann (right) anticipate that this collaboration will help them recruit the best young talent.

On the Net



Coral Reefs in Time Lapse

Corals are among the most colorful inhabitants of the sea. These cnidarians are found not only in tropical waters bathed in light, but also at depths of over 2,000 meters below sea level. A four-minute video consisting of more than 25,000 macro images shows the corals' shimmering beauty. The images were taken at the Great Barrier Reef off the coast of Australia and document one of the greatest natural wonders of our Earth. This sensitive ecosystem is in extreme peril as a result of global warming and ocean acidification, but also due to tourism and the planned expansion of a coal port.
vimeo.com/156942975

Worth Talking About

Telling stories, explaining, discussing, persuading, teaching – what people achieve with language goes far beyond the mere exchange of information. Without language, there would be neither trade nor politics, neither religion nor science, neither rights nor poetry. But the phenomenon of language contains many puzzles. To what do we owe this unique human capability? How do children learn to speak? And what characteristics has language developed in different parts of the world? A new dossier with interviews, videos and podcasts provides an overview of important research questions within the Max Planck Institutes.
www.mpg.de/language-research

Focus on Equal Opportunity

Talent, creativity and passion – these are the qualities the Max Planck Society banks on. The Society supports employees regardless of their gender, nationality, religion, disability, age, cultural origin or sexual orientation: the basis for successful research lies in diversity. To further reinforce this diversity, the Max Planck Society offers various forms of assistance that are concisely presented on its career website. The reconciliation of family life, leisure and work, the advancement of female scientists with the aim of enabling greater numbers of them to take up management positions, and mentoring and career development are all important pillars in this strategy.
www.mpg.de/equal_opportunities