MAX PLANCK INSTITUTE
FOR SOLAR SYSTEM RESEARCH

MPS

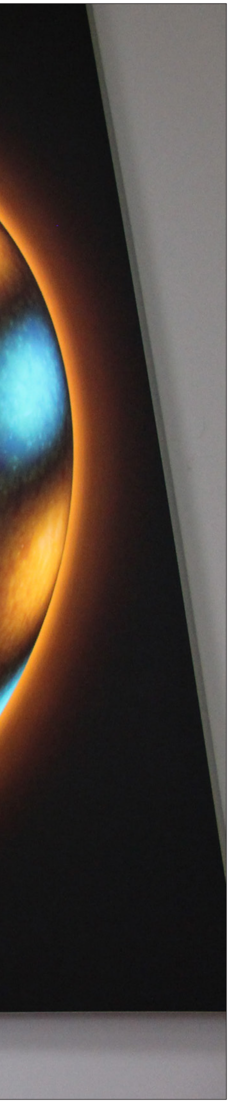
MAX PLANCK INSTITUTE
FOR SOLAR SYSTEM RESEARCH

An Introduction

^ Three departments - three images

The images on the eastern wall of the foyer represent the Institute’s main research areas: Sun and heliosphere, planetary science, and solar and stellar interiors (from left to right).

SOLAR SYSTEM RESEARCH UNDERSTANDING OUR HOME IN THE COSMOS

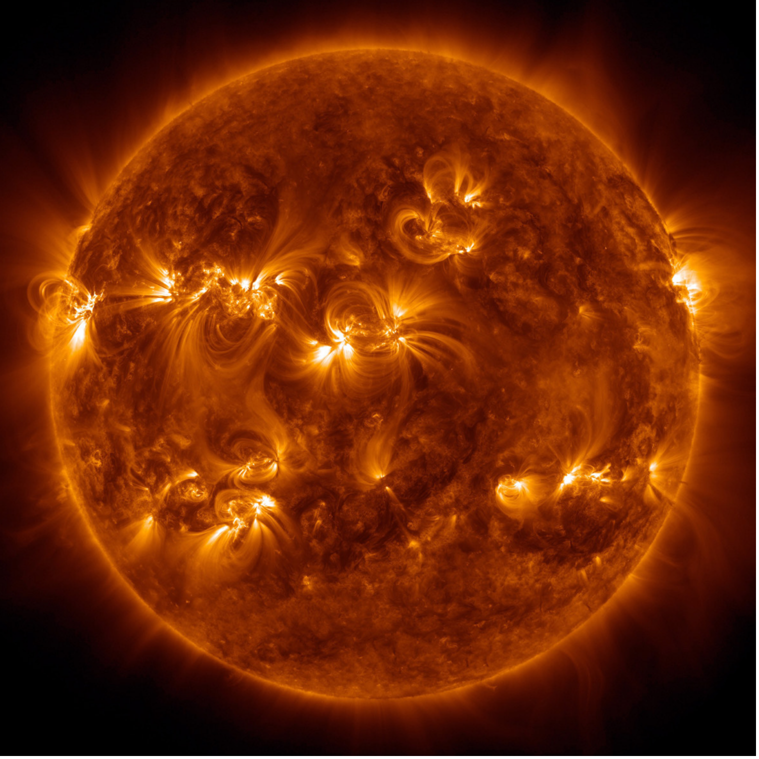


Our cosmic home, the Solar System with its planets, moons, asteroids, comets, and our star, the Sun, is the subject of research at the Max Planck Institute for Solar System Research. How did these bodies originate? How did they evolve? What characteristics distinguish them today? And how do they influence each other?

The possibilities for answering these questions have improved dramatically in recent years and decades. Numerous space probes are currently traveling through the Solar System, capturing scientific data from the Sun and the planets from great proximity; powerful large telescopes on Earth or in the stratosphere provide a detailed view of these bodies; high-precision methods allow meticulous analyses of rock samples; and modern computers simulate even the most complex processes, such as those inside the Sun or in the atmospheres of the planets.

Parallel to this development, our view of the Solar System has changed fundamentally. It has become clear that our planetary system is not unique, but only one among countless others. Researchers assume that virtually all stars are surrounded by planets.

This gives the exploration of our own cosmic home a special significance. Due to its proximity to Earth, the Sun is the only star we can study in detail. The same applies to our planets and, even more so, to their moons as well as the asteroids and comets in our Solar System. Our cosmic home is thus a kind of test case for general theories of planetary systems and stars. At the same time, comparisons with distant stars and worlds help us understand our own place in the Universe.



Department:

Sun and Heliosphere

Sami K. Solanki

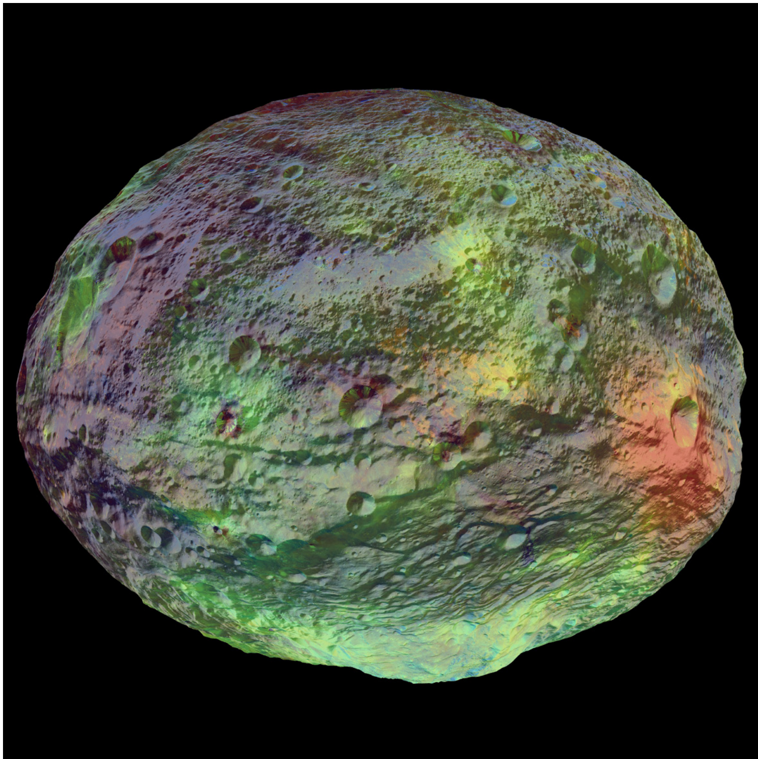
Solar and Stellar Coronae
Solar Lower Atmosphere and Magnetism
Solar and Stellar Magnetohydrodynamics
Solare Variability and Climate

Department:

Planetary Science

Thorsten Kleine

Extraterrestrial Samples
Simulation of Planetary Formation
Experimental Planetology
Space Missions

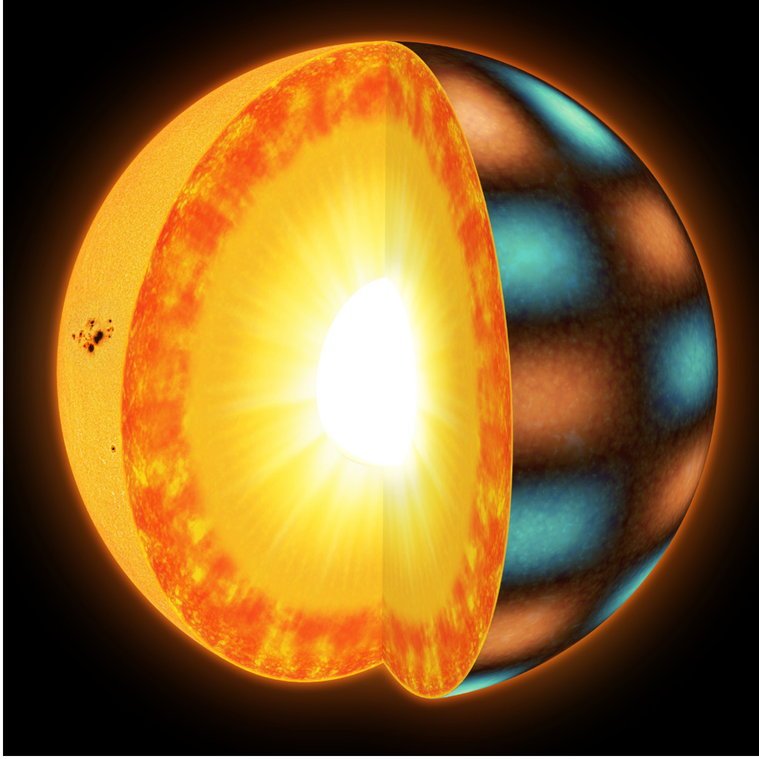


Department:

Solar and Stellar Interiors

Laurent Gizon

Helioseismology
Asteroseismology
Solar and Stellar Cycles
Solar and Stellar Spectra
PLATO Data Center



Research Groups

ORIGIN: Resolving Magnetic ORIGINs of the Hot Solar Corona

Lakshmi Pradeep Chitta | ERC Starting Grant

PLANETOIDS: Formation of Planetary Building Blocks through Space and Time

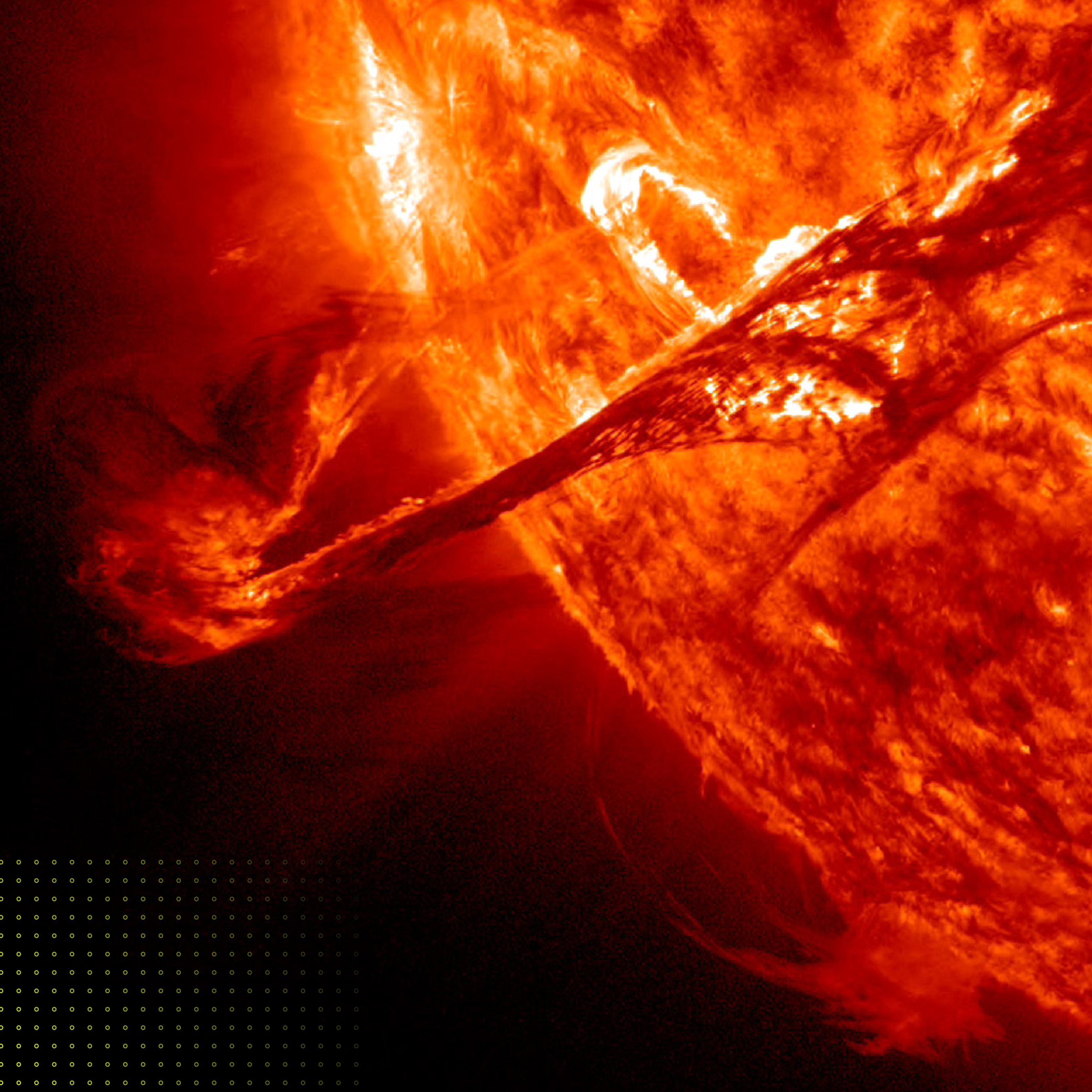
Joanna Drążkowska | Lise Meitner Group, ERC Starting Grant

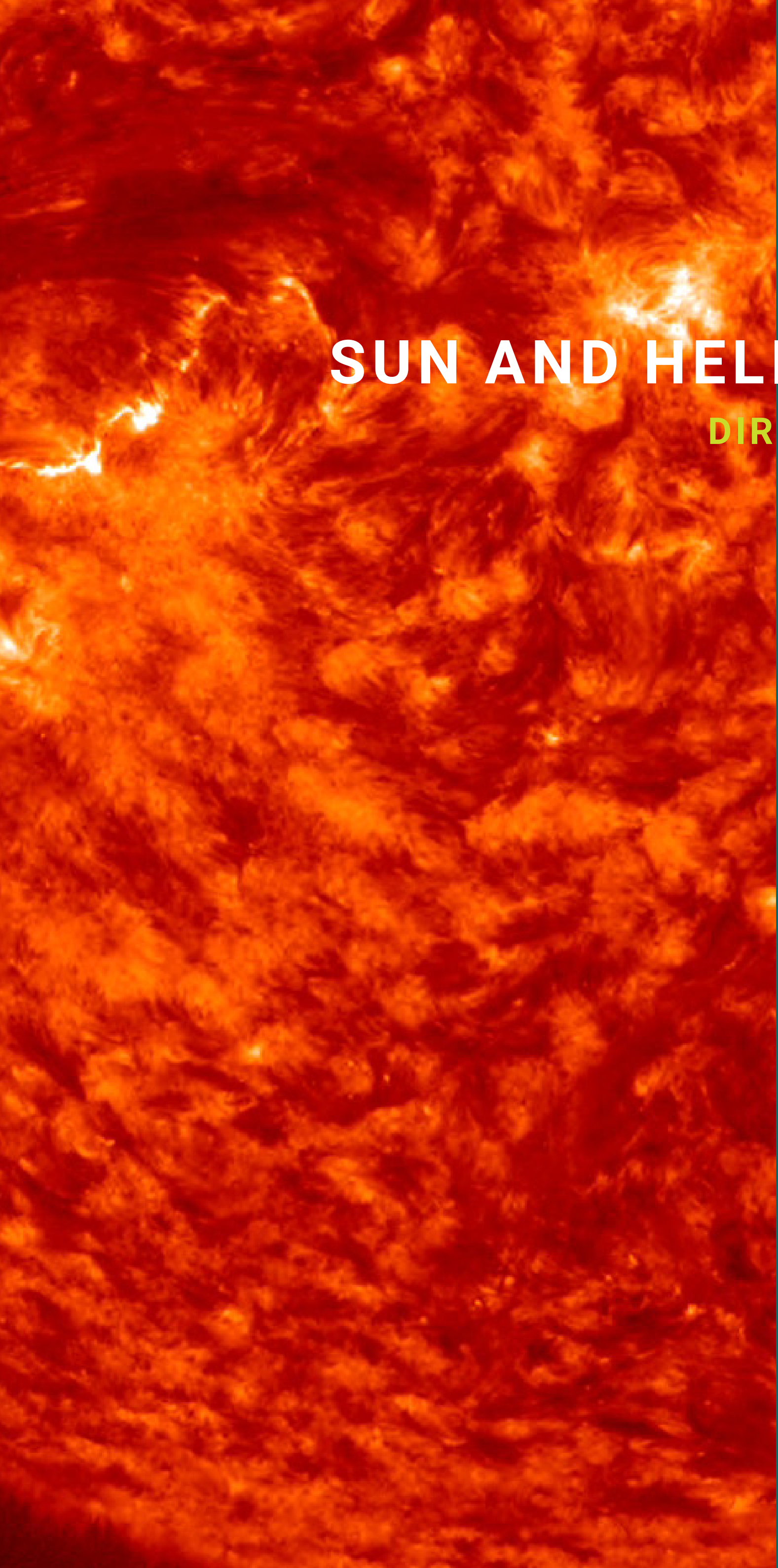
ComFyDA: Computational Fluid Physics and Data Assimilation

Xiaojue Zhu | Max Planck Research Group

Inverse Problems

Thorsten Hohage | Max Planck Fellow Group





SUN AND HELIOSPHERE

DIRECTOR: SAMI K. SOLANKI

RESEARCH TOPICS:

SOLAR AND STELLAR CORONAE

SOLAR LOWER ATMOSPHERE AND MAGNETISM

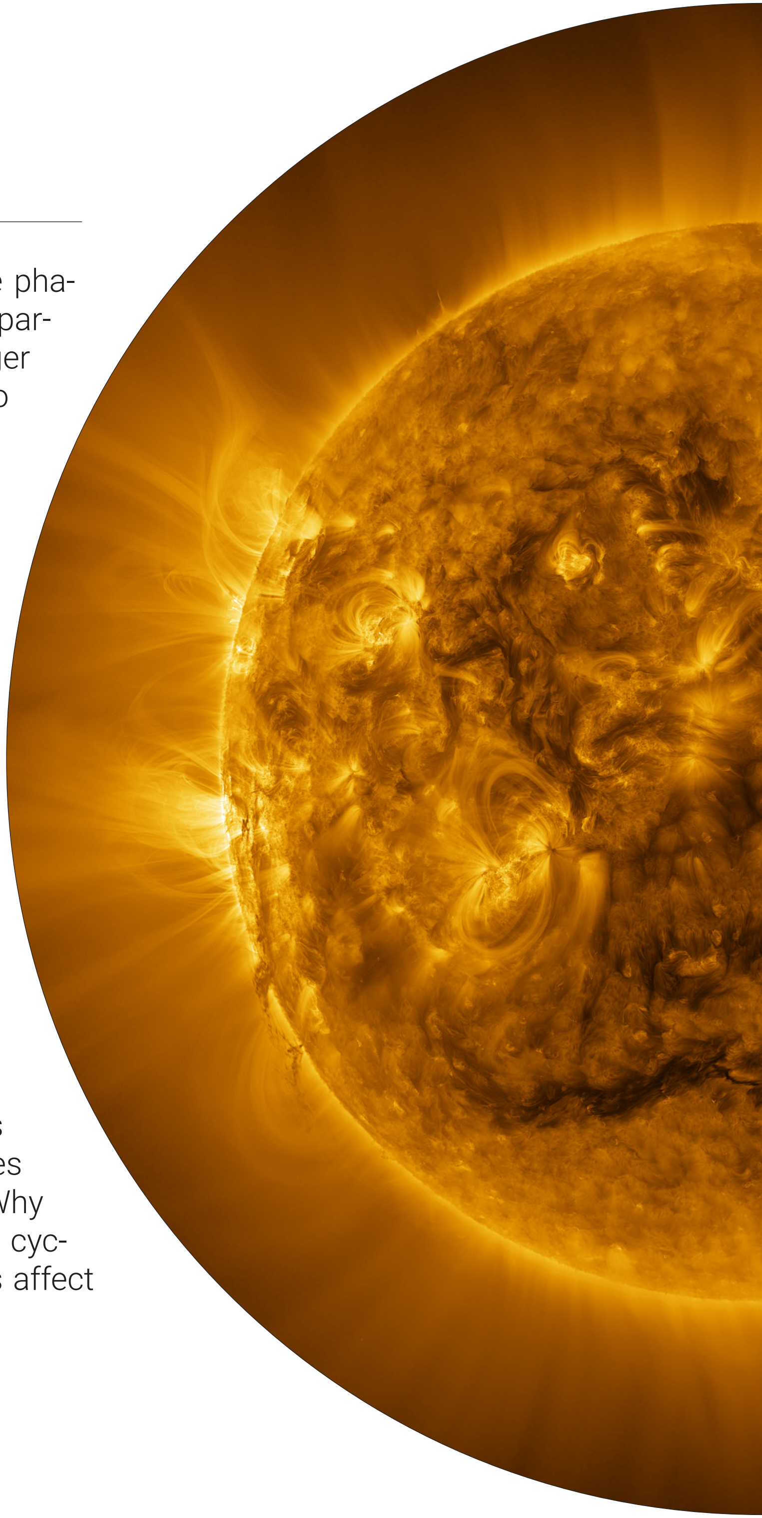
SOLAR AND STELLAR MAGNETOHYDRO-DYNAMICS

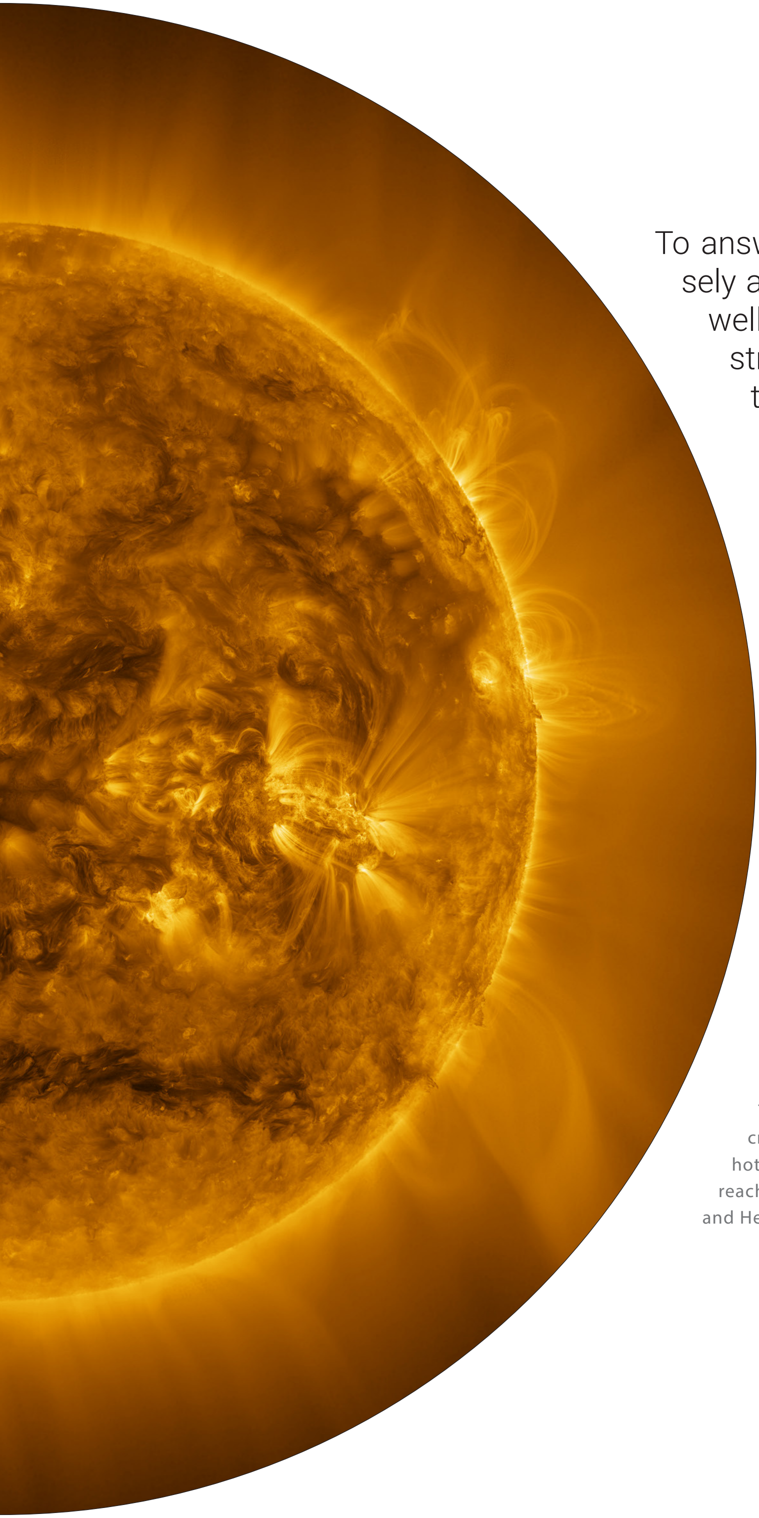
SOLAR VARIABILITY AND CLIMATE

THE SUN
FIREWORKS IN SPACE

The Sun is a restless star. During its active phases, powerful eruptions hurl radiation and particles into space. These eruptions can trigger auroras on Earth, but also have the potential to damage technical infrastructure such as satellites. During periods of high solar activity, many sunspots cover our star's visible surface and hot, loop-shaped plasma streams protrude from its atmosphere far into space. These solar tantrums are followed by periods of calm. Deciphering the capricious nature of the Sun is the goal of the Max Planck Institute for Solar System Research.

The Sun's magnetic field is the key driver of its behavior. It originates deep inside the Sun. From there, plasma streams wash the magnetic structures to the surface, from where they extend far into the atmosphere. In the complex interplay between the magnetic field and hot solar plasma, researchers are searching for answers to current questions in solar physics: How does the Sun manage to heat its outer atmosphere to a million degrees? How does the Sun accelerate the solar wind into space? Why do its activity fluctuations follow an eleven-year cycle? And how do changes in the Sun's brightness affect Earth?





To answer these questions, researchers must look closely at the smallest flares in the Sun's atmosphere as well as at enormous eruptions, at delicate magnetic structures as well as at giant sunspots, at changes taking place within minutes or seconds as well as those spanning decades or even centuries.

To this end, the Institute develops scientific instruments that observe the Sun from space, from the stratosphere, or from the ground. The observational data is then compared with the results of computer simulations, leading to a deeper understanding of our active star.

< The Sun as seen through the eyes of Solar Orbiter

This image taken by the Extreme Ultraviolet Imager (EUI) on board the spacecraft Solar Orbiter shows the Sun's corona, which is more than a million degrees hot, in ultraviolet light. How this outermost layer of the Sun's atmosphere can reach such high temperatures is one of the research topics of the department "Sun and Heliosphere".

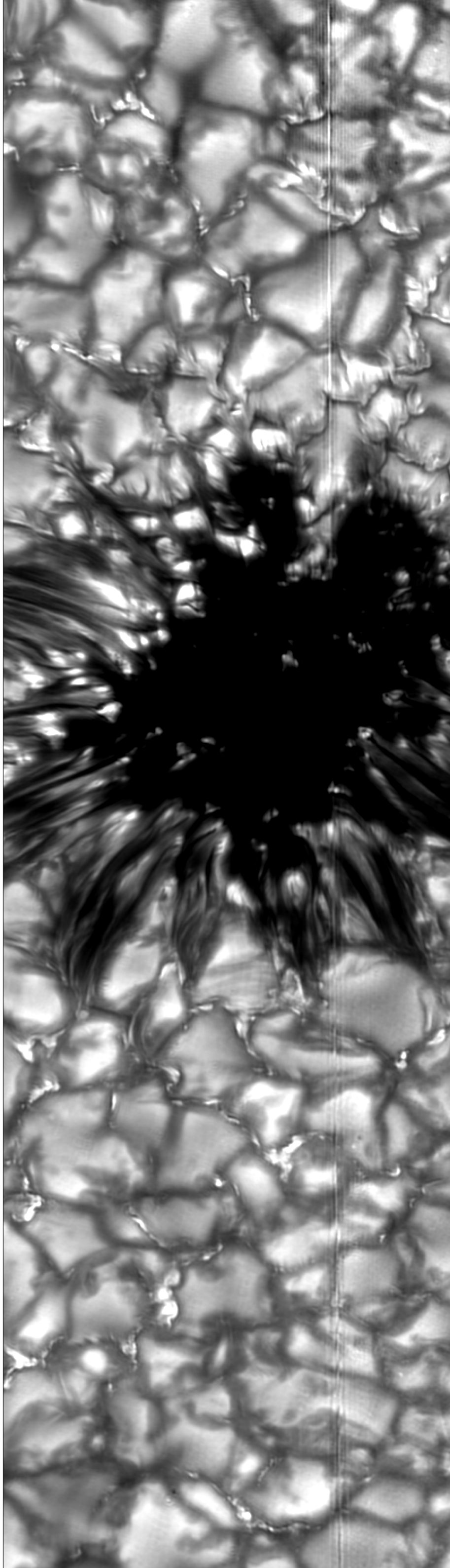

VARNING
Warning the driver has limited visibility.
Varning, föraren har begränsad sikt.

THE SUN A NEW LOOK AT OUR STAR

Solar observations are currently experiencing a golden age. Space probes, stratospheric observatories, and telescopes on Earth are providing unique observational data that was previously unthinkable: from completely new perspectives, with unprecedented detail, continuously, and over long periods of time. The Max Planck Institute for Solar System Research has initiated and played a key role in many of these missions and projects.

For example, the Institute's balloon-borne solar observatory Sunrise looks at our star from the stratosphere, enabling uninterrupted observations with the highest spatial resolution for several hours at a time. The European Space Agency's space probe Solar Orbiter carries on board four scientific instruments developed and built at the Max Planck Institute for Solar System Research. From its orbit around the Sun, Solar Orbiter can not only look at our star's far side, but for the first time can also discern its poles. The space probe Vigil, to which the Institute is also contributing, detects solar eruptions before they can become dangerous to Earth

In addition, researchers at the Institute look into the past of our star – and deep into space. Natural archives such as tree rings and ice cores as well as historical drawings and observational data reveal how active the Sun was in the past. Comparison with the huge group of sun-like stars reveals the capricious nature of our star.



Dark spot on the Sun>

A look at the Sun's visible surface through the eyes of Sunrise III reveals a sunspot, its finely structured penumbra, and the typical granulation pattern of the solar surface.

< Solar research on a balloon

A helium balloon carries the solar observatory Sunrise III into the stratosphere. There, no air turbulence disturbs the view of the Sun and Sunrise III has access to the Sun's ultraviolet radiation.

PLANETARY SCIENCE

DIRECTOR: THORSTEN KLEINE

RESEARCH TOPICS:

EXTRATERRESTRIAL SAMPLES

SIMULATIONS OF PLANETARY FORMATION

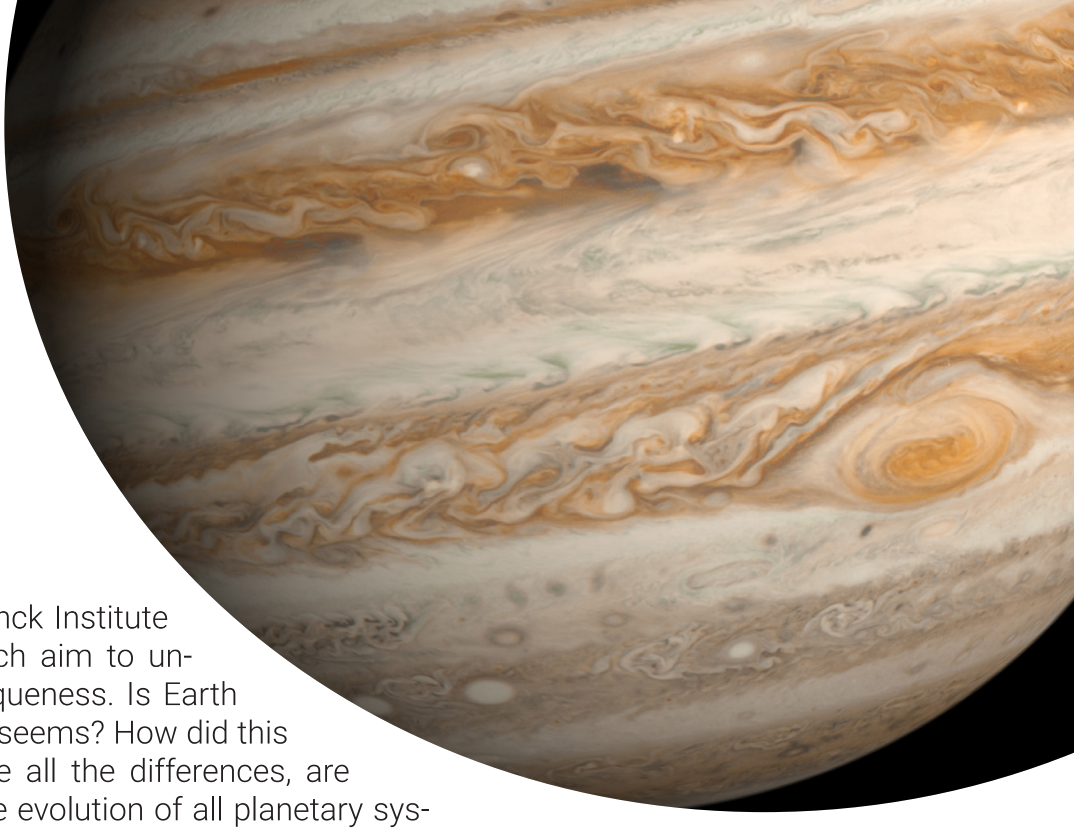
EXPERIMENTAL PLANETOLOGY

SPACE MISSIONS

COSMIC ODDBALL OF EARTH AND OTHER PLANETS

Earth is unique. With its vast water reserves, oxygen-rich atmosphere, and protective magnetic field, it is the only planet in our Solar System that has evolved into a world brimming with life. Even its closest neighbors took a different path: Mercury is a hot desert planet, Venus is shrouded in an atmosphere of corrosive sulfuric acid, and Mars most likely lost first its magnetic field, later its water and most of its atmosphere.

Even in cosmic terms, Earth and the Solar System are special. Most of the distant planetary systems discovered so far have a completely different structure. Rocky planets orbiting their stars at a life-friendly distance are exceedingly rare.



Gas giant Jupiter >

Jupiter plays a key role in our Solar System. Hidden beneath thick ice crusts, some of its icy moons could harbor conditions suitable for life. In addition, Jupiter's formation is likely to have had a decisive influence on the further development of the Solar System.

Scientists at the Max Planck Institute for Solar System Research aim to understand our cosmic uniqueness. Is Earth really as exceptional as it seems? How did this come about? And despite all the differences, are there laws that govern the evolution of all planetary systems?

To answer these questions, we need a deep understanding of the bodies populating today's Solar System and their diversity: of our closest companion the Moon, of the rocky planets near the Sun, and of the enormous gas giants at the edge of the Solar System. It is equally important to look back at the beginnings of our Solar System. This is the only way to understand how Earth became the place we know today.

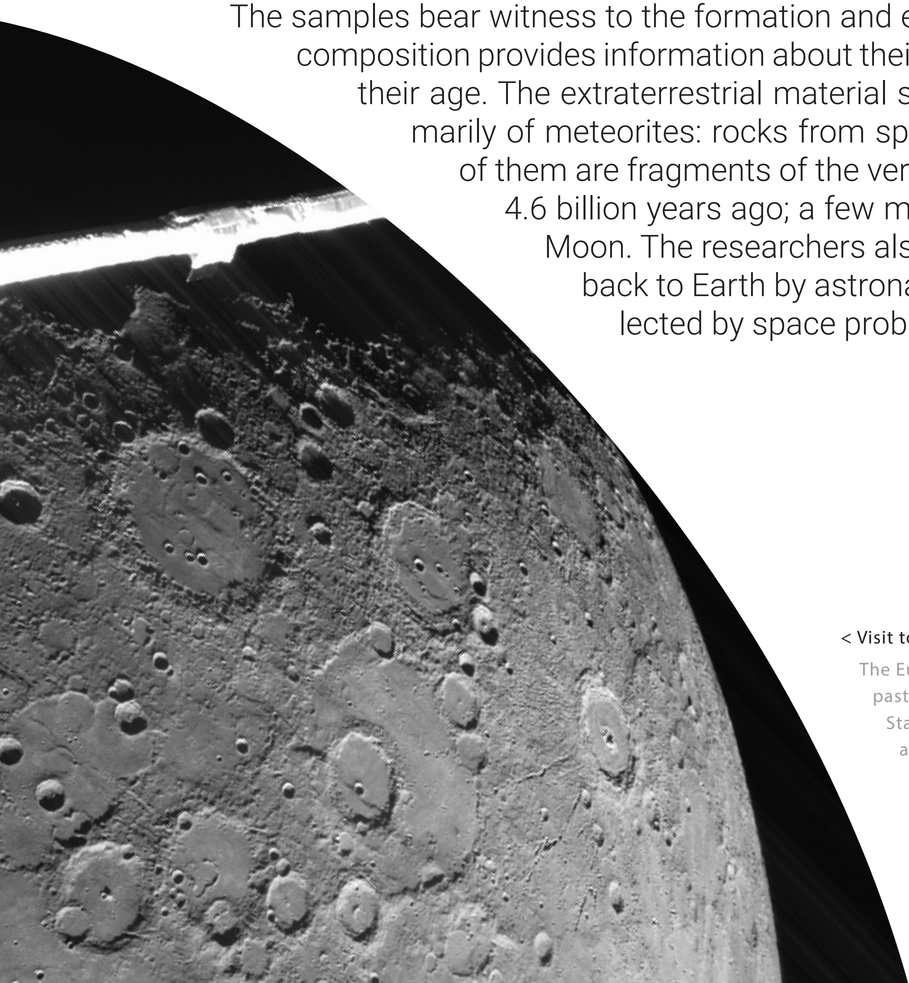
< Blue planet

When planetary scientists peer into space, they are actually concerned with Earth. How did our planet become the life-friendly world we know today? And why is it so different from its planetary siblings?

RESEARCH IN SPACE AND IN THE LAB OF SPACE PROBES AND SPACE ROCKS

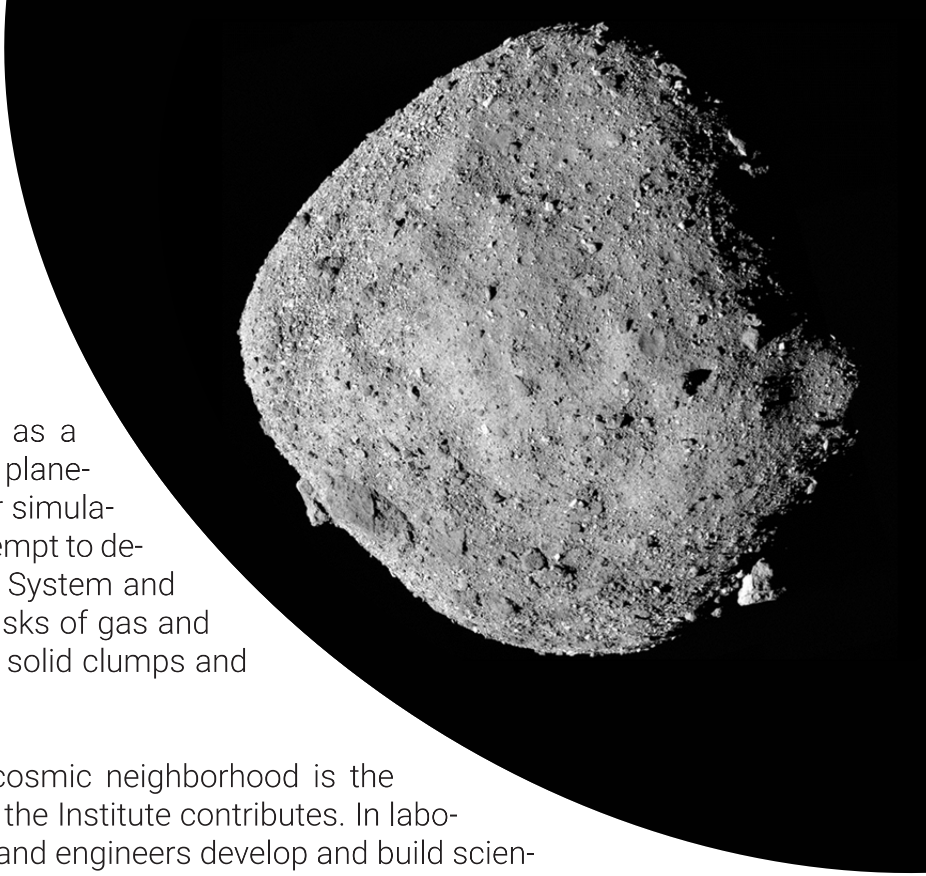
To decipher how the planets in our Solar System were formed and what state they are in today, scientists at the Max Planck Institute for Solar System Research use a variety of methods.

One of these is high-precision laboratory analysis of extraterrestrial rock samples. The samples bear witness to the formation and evolution of the Solar System. Their composition provides information about their place of origin, their evolution, and their age. The extraterrestrial material studied at the Institute consists primarily of meteorites: rocks from space that have fallen to Earth. Most of them are fragments of the very first planetary bodies that formed 4.6 billion years ago; a few meteorites originated on Mars or the Moon. The researchers also work with lunar samples brought back to Earth by astronauts and with asteroid samples collected by space probes and transported to Earth.



< Visit to Mercury

The European space probe BepiColombo took this picture as it flew past Mercury. On board: scientific instruments from Göttingen. Starting with its next flyby, the probe will swing into orbit around the planet.



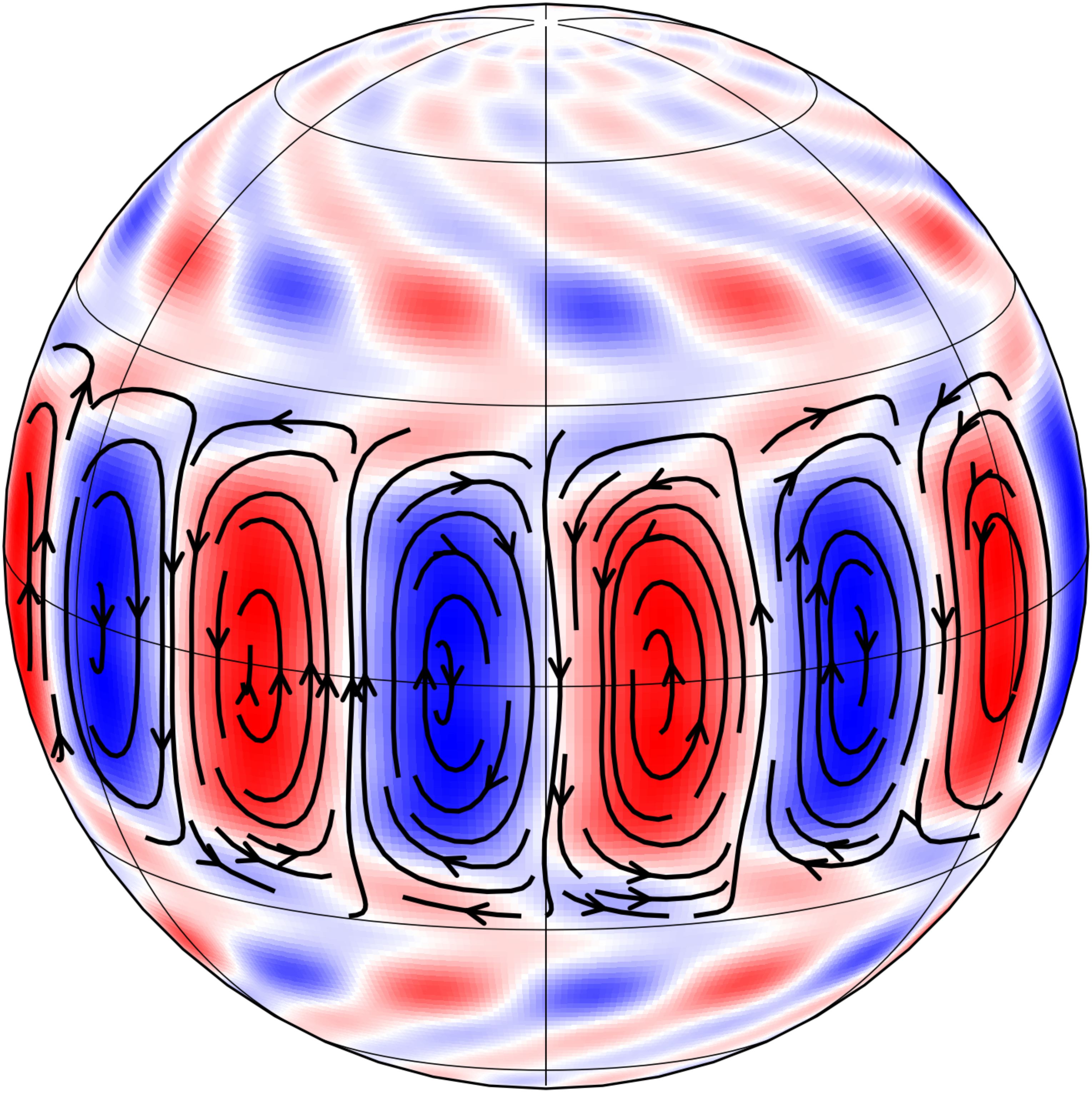
Asteroid Ryugu >
The rock sample brought back to Earth from the near-Earth asteroid Ryugu by the Japanese space probe Hayabusa 2 weighed only a few grams. Laboratory tests at the Institute show that the asteroid originated in the outer Solar System.

The laboratory analyses also serve as a test case for theoretical models of planetary formation. In complex computer simulations, researchers at the Institute attempt to describe the entire history of the Solar System and other planetary systems: from the disks of gas and dust orbiting young stars to the first solid clumps and finally the planets.

Exploring the current state of our cosmic neighborhood is the goal of the space missions to which the Institute contributes. In laboratories and clean rooms, scientists and engineers develop and build scientific instruments that travel through space on board space probes. The instruments record uniqie data - during flybys, from the orbits around distant planets or from their surfaces.

Current destinations for such space probes carrying hardware from Göttingen include Jupiter and its icy moons as well as Mercury. Future missions will head to Venus, Mars, and asteroids. In recent years and decades, scientific instruments developed and built at the Max Planck Institute for Solar System Research have landed on Mars and Saturn's moon Titan, explored the asteroid belt and the Saturnian system, and orbited Venus.

To better understand the scientific data from the depths of space, the researchers return to the laboratory. There, the processes on distant planets such as Mercury can be reproduced, controlled - and gradually deciphered.



SOLAR AND STELLAR INTERIORS

DIRECTOR: LAURENT GIZON

RESEARCH TOPICS:

HELIOSEISMOLOGY

ASTEROSEISMOLOGY

SOLAR AND STELLAR CYCLES

SOLAR AND STELLAR SPECTRA

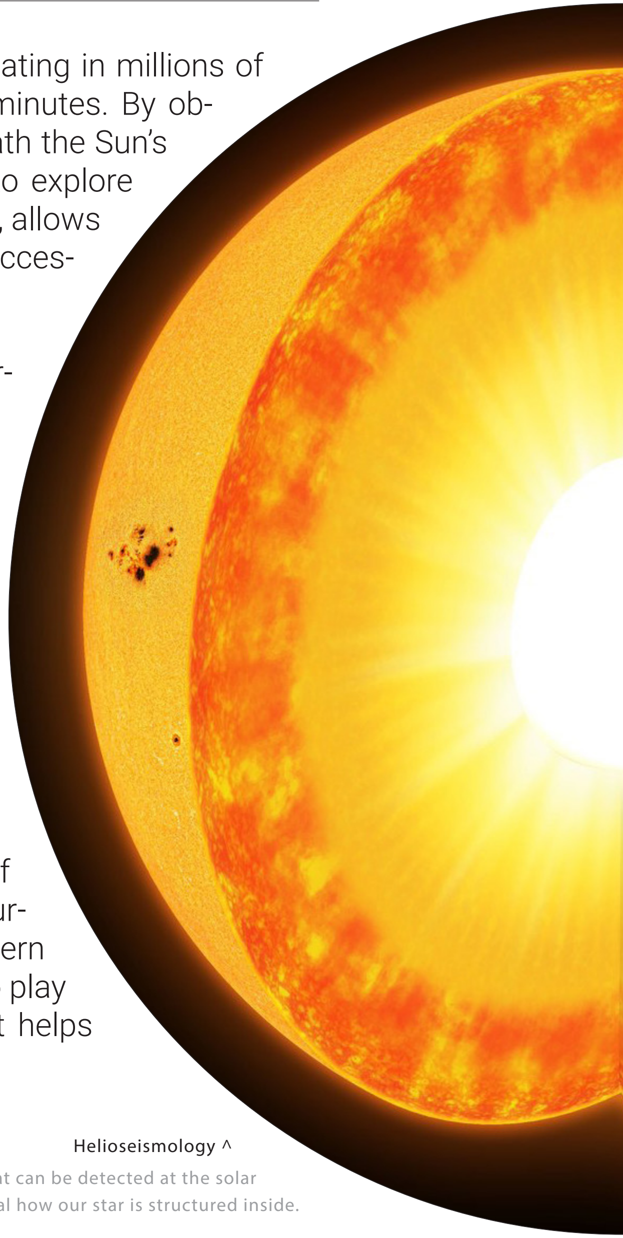
PLATO DATA CENTER

HELIOSEISMOLOGY LOOKING INSIDE THE SUN

The Sun vibrates much like a musical instrument, resonating in millions of acoustic modes of oscillation with periods near five minutes. By observing the oscillations, scientists can peer deep beneath the Sun's visible surface – just as seismologists study earthquakes to explore the Earth's interior. This technique, known as helioseismology, allows researchers to probe regions of the Sun that are otherwise inaccessible.

Helioseismology has led to major breakthroughs in our understanding of the Sun. It has made it possible to precisely locate the boundary between the Sun's deep interior, where heat is transported by radiation, and the outer layers, where heat is transported by convection. It has also allowed scientists to measure how the Sun's rotation changes with depth and latitude. This information is crucial for understanding the solar dynamo – the process by which the Sun's internal motions generate its global magnetic field.

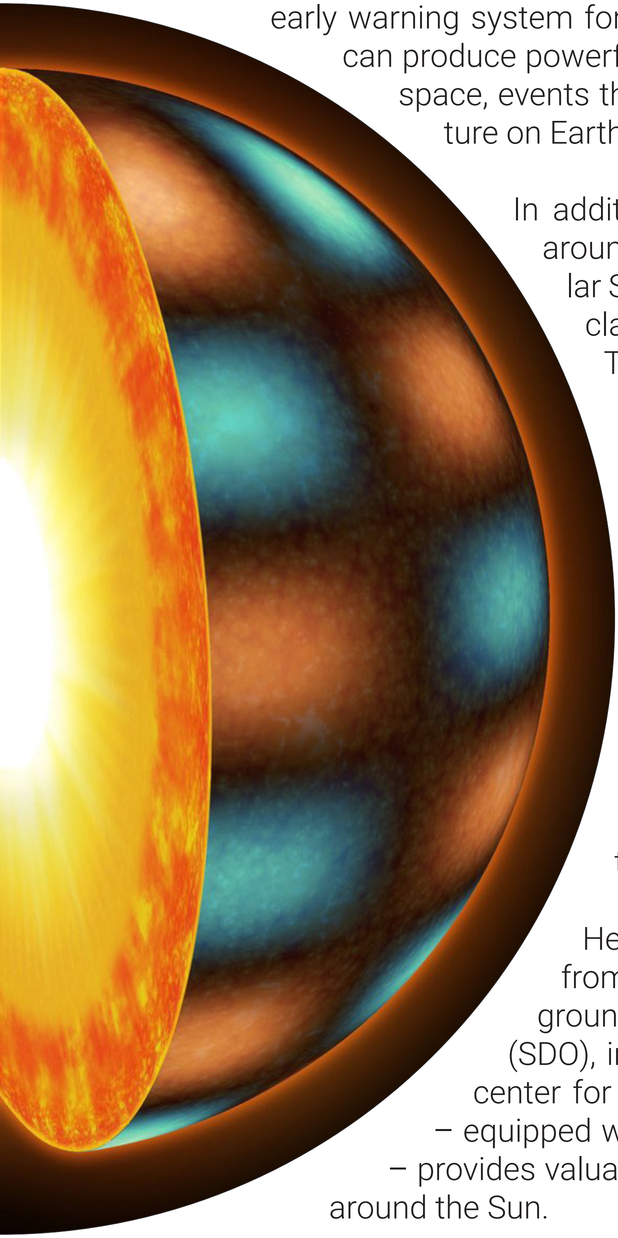
Improved helioseismology techniques developed at the Max Planck Institute for Solar System Research have made it possible to detect large-scale circulation patterns inside the Sun. In particular, scientists have been able to infer a slow flow of plasma moving from the equator toward the poles near the surface, and back toward the equator in deeper layers – a pattern known as meridional circulation. This circulation is thought to play a key role in controlling the eleven-year sunspot cycle, as it helps transport and reorganize the Sun's magnetic field over time.



Helioseismology ^

Oscillations that can be detected at the solar surface reveal how our star is structured inside.

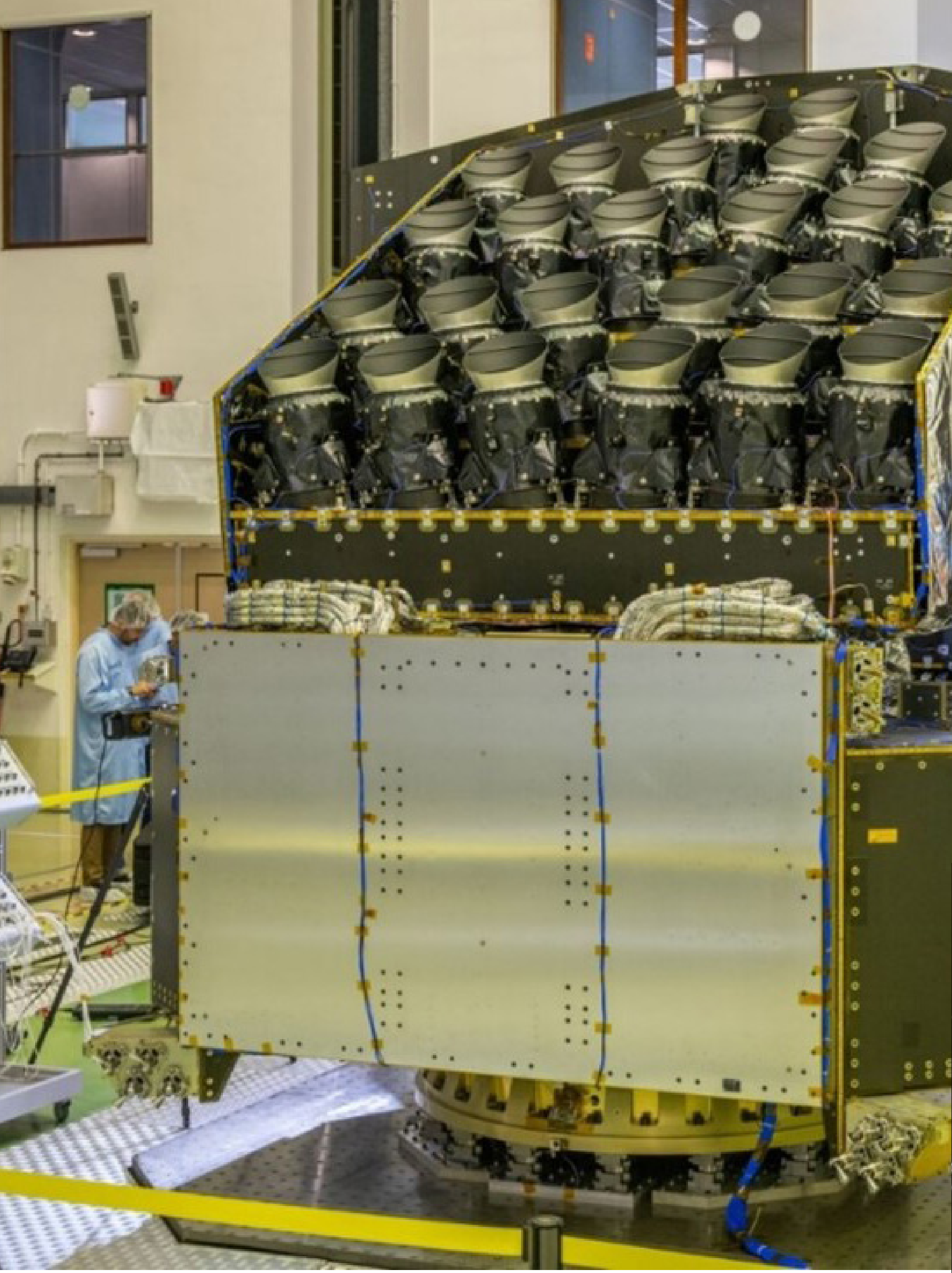
Helioseismology can also detect regions of strong magnetic activity on the far side of the Sun, beyond the reach of direct observation. This approach, known as farside helioseismology, serves as an early warning system for active regions that will later rotate into view. These regions can produce powerful solar flares, releasing energetic particles and radiation into space, events that can endanger satellites, astronauts, and power infrastructure on Earth.



In addition to the well-known acoustic oscillations with periods of around five minutes, researchers at the Max Planck Institute for Solar System Research have discovered and characterized a second class of oscillations with much longer periods of several weeks. These long-period oscillations arise from the Sun's rotation and are linked to large-scale swirling motions on the solar surface, resembling the Rossby waves that influence weather patterns on Earth.

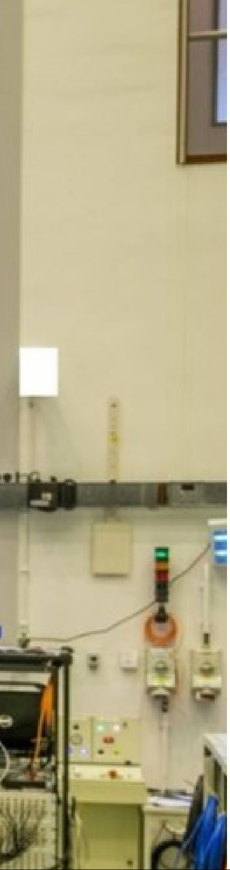
Using these modes, researchers at the Max Planck Institute for Solar System Research revealed a temperature difference of about seven degrees between the Sun's poles and equator. This temperature gradient affects the Sun's angular momentum balance and helps explain its unusual rotation pattern – where the equator spins faster than the higher latitudes. As the long-period oscillations transport heat from the poles toward the equator, they play a key role in shaping the Sun's latitudinal differential rotation.

Helioseismology depends on high-quality observational data from both ground and space. Key sources include the GONG ground-based network and NASA's Solar Dynamics Observatory (SDO), in operation since 2010. The Institute hosts a dedicated data center for the SDO mission. In addition, ESA's Solar Orbiter spacecraft – equipped with the institute's Polarimetric and Helioseismic Imager (PHI) – provides valuable complementary observations from unique vantage points around the Sun.



^ PLATO in the clean room

Equipped with 26 cameras, the space probe PLATO captures the light of millions of stars.



PULSATING STARS
CHARACTERIZING PLANET HOSTS

Our galaxy, the Milky Way, contains over 100 billion stars – some that closely resemble our Sun and others that differ in size, mass, temperature, and age. Each star emits light that carries clues to its structure and evolution. Space telescopes capture this starlight, and researchers at the Max Planck Institute for Solar System Research use advanced techniques of analysis to interpret it.

Asteroseismology is the study of stellar oscillations: subtle vibrations caused by sound waves traveling through a star's interior. The frequencies of the oscillations depend on the star's internal properties, such as its mean density, composition, and age. By analyzing this seismic "fingerprint," scientists can determine a star's fundamental characteristics with remarkable precision.

The brightness variations of a star reveal even more. They can help us detect planets orbiting the star: when a planet passes in front of its host star, it briefly blocks a fraction of the light, causing a slight dip in brightness. This method has already led to the discovery of thousands of exoplanets. Once the star's properties have been accurately determined through asteroseismology, researchers can infer the sizes, masses, and age of its planets.

The European spacecraft PLATO will be launched in 2026. With its 26 cameras, it will record the brightness fluctuations of millions of Sun-like stars over many years. Its task: to find Earth-like planets orbiting Sun-like stars. The Max Planck Institute is home to the mission's data center.

< PLATO in space

PLATO will continuously monitor two large areas of the sky, dedicating two years of observation time to each, in its search for Earth-like planets.

RESEARCH INFRASTRUCTURE
FOUNDATION OF SCIENTIFIC SUCCESS

Excellent research requires highly specialized and cutting-edge infrastructure. At the Max Planck Institute for Solar System Research, this infrastructure includes laboratories, clean rooms, workshops, large-scale equipment, and testing facilities, as well as the computer center. Administration, library, and guest services provide the necessary prerequisites for research, publishing, and scientific exchange.

Workshops and Electronics Laboratory

The precision engineering and metal workshops produce high-precision mechanical components for the scientific instruments developed and built at the Max Planck Institute for Solar System Research. The electronics laboratory manufactures, calibrates, and qualifies the electrical systems for these instruments.

A look inside the precision engineering workshop v

Whether on a lathe, a 5-axis milling machine, or a die sinker Electric Discharge Machine - a wide variety of components are manufactured in the Institute's workshop. These include spare parts for the laboratories, technical test models, and components for flight hardware.

HPC-Cluster SWAN (next page) >

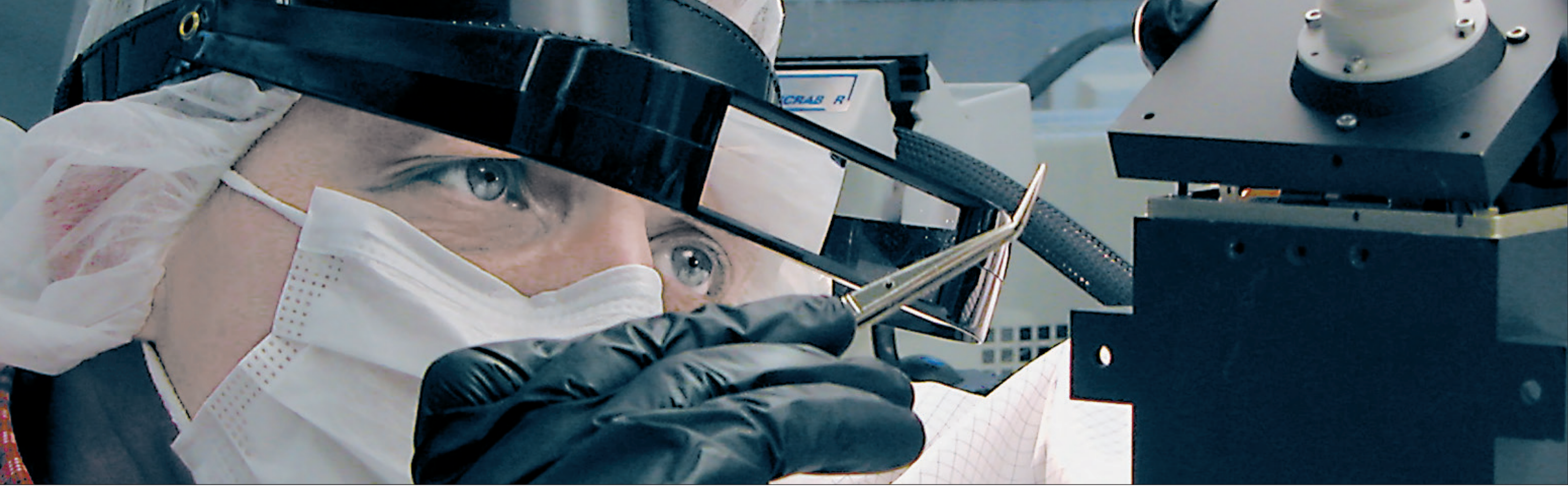
The high-performance computing cluster "SWAN" makes it possible to carry out complex calculations and simulations quickly and efficiently. It is named after the astronomer Henrietta Swan Leavitt (1868–1921).

Computer Center
The computer center manages and operates the hardware and software for around 500 workstations and measuring stations, provides extensive storage and computing power, and supports researchers in optimization and programming. It houses two HPC clusters and systems for archiving and backing up large amounts of data, much of which is generated in international space missions.

Mass Spectrometers
The Max Planck Institute for Solar System Research operates several mass spectrometers for analyzing meteorites and other extraterrestrial rock samples. The spectrometers make it possible to determine the ratios of certain isotopes in the samples with extremely high accuracy.

Clean Rooms
The Max Planck Institute for Solar System Research has numerous clean rooms of various purity classes covering more than 1,600 square meters. These rooms are used to integrate scientific instruments that collect data in space or from the stratosphere. There are also special areas where equipment for use on Mars is built. Additional clean rooms allow the preparation of extraterrestrial rock samples for further analysis.

Testing Facilities
To ensure that instruments for space missions can withstand the conditions in space and on the way there, they are tested and qualified in advance. The vibrational testing facility simulates the vibrations during rocket launch, while thermal vacuum facilities simulate the cold and vacuum of space. In additional thermal vacuum chambers, spare units for instruments already travelling through space are stored under space-like conditions.



INSTRUMENTS FOR SPACE
FLIGHT HARDWARE MADE IN GÖTTINGEN

One of the special areas of expertise of the Max Planck Institute for Solar System Research is the development and construction of scientific instruments for space missions. On board space probes, these instruments travel through space, explore planets, moons, asteroids, comets, and the Sun, and send scientific data back to Earth. The variety of space hardware built at the Institute comprises remote sensing instruments like cameras and telescopes examining their research objects from a large distance as well as in situ instruments measuring the particles surrounding them.

Almost all steps necessary to develop and build such instruments are carried out at the Institute: from the initial design on the computer, through the manufacturing of mechanical and electronic components, to the assembly of the instrument, calibration, environmental testing, and quality control. Each instrument is developed in cooperation with other research institutions that contribute parts and subsystems.

This process starts with a scientific objective. It determines which tasks the instrument will need to perform when it is eventually deployed in space. Space agencies such as ESA and NASA specify requirements in terms of size, weight, and energy consumption. Researchers and engineers then work closely together to develop a design for the instrument on the computer.

The next step is to start building the first structural models. These undergo various tests: they have to prove that they can withstand the vibrations during rocket launch as well as the cold and vacuum of space. The knowledge gained in these tests is the prerequisite for building the flight hardware under strict quality control in the Institute's clean rooms. A second, identical instrument is then manufactured and remains at the Institute. It is used to help interpret the scientific data from space and resolve any operational issues.

The development and construction of a space instrument takes several years. The duration of the subsequent flight to the research object depends on the mission's destination. Travel times of up to ten years are not uncommon.

Current missions with Institute participation:

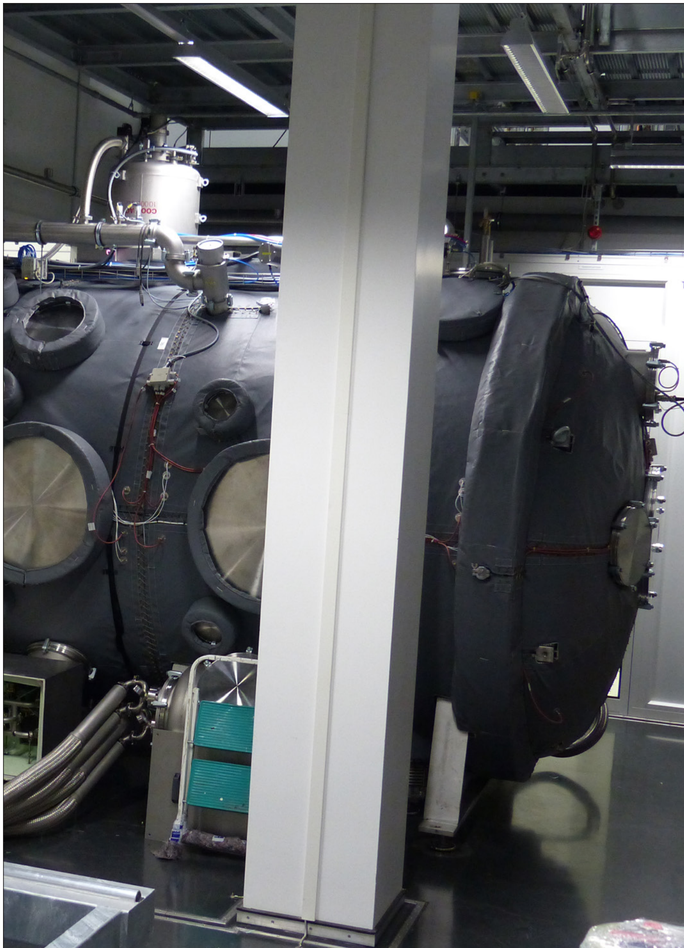
Mission	**Launch**	**Research Object**
Vigil	2031	Sun
EnVision	2031	Venus
Solar-C	2028	Sun
ExoMars	2028	Mars
RAMSES	2028	Apophis
MUSE	2027	Sun
PLATO	2026	Exoplanets
JUICE	**2023**	Jupiter
Solar Orbiter	**2020**	Sun
BepiColombo	**2018**	Mercury

Details about the missions can be found at:

www.mps.mpg.de/en

Thermal vacuum test chamber >

"BigMac" is the largest test chamber at MPS. With a length of 5 meters and a diameter of 2 meters, it can accommodate even larger instruments. The temperature can be varied from -170 °C to +100 °C, allowing to simulate the conditions inherent to different missions. A system of mirrors installed on the Institute's roof allows real sunlight to be directed into the chamber.



POSTGRADUATE STUDIES
INTERNATIONAL MAX PLANCK RESEARCH SCHOOL

The Max Planck Institute for Solar System Research is not only home to outstanding scientists, but also offers young researchers ideal research and learning conditions in preparation for a career in science and industry.
Under the name "International Max Planck Research School for Solar System Science at the University of Göttingen and TU Braunschweig," the Institute offers an internationally oriented doctoral program in collaboration with two universities.

In the three-year research projects, participants conduct research directly related to relevant scientific questions in their field of expertise, thereby contributing significantly to the Institute's publications. The research topics of the doctoral candidates range from astrophysics and geosciences to mathematics and engineering. The young scientists are supported by at least two experienced researchers, often including one of the Institute's directors.

In addition to their research, students are involved in academic teaching in bachelor's and master's programs at partner universities and refine their skills in advanced courses on Solar System research. The Institute also emphasizes the importance of responsible conduct. Courses on good scientific practice and scientific ethics are therefore mandatory in the first year of study.

An integral part of each year is a week-long retreat at a scientifically significant location outside Göttingen focusing on workshops and lectures as well as joint excursions and visits to places relevant to the program's topics.

At any given point, the program comprises approximately 50 doctoral candidates from approximately 30 countries. Since 2001, more than 240 students have successfully completed the program with a doctorate. A significant number of the graduates remain in academia.

^ Doctoral theses

The doctoral theses cover topics from all areas of Solar System research.

< Tour of the Astrophysical Observatory in Potsdam

Themed excursions, such as a visit to the Great Refractor from 1899, are an integral part of the program and promote a positive sense of community.

VOCATIONAL TRAINING
LEARNING CRAFTSMANSHIP FOR SPACE

With its vocational training program, the Max Planck Institute for Solar System Research assumes social responsibility and has been training apprentices since 1949. Since then, more than 400 young adults have been prepared for professional life as a craftsperson. 17 of these apprentices have received prestigious awards on the national and state level.

The Institute currently educates apprentices in four different fields. The vocational training is completed with an exam at the Chamber of Industry and Commerce. Whenever possible, apprentices are involved in actual projects contributing to the institute's research mission. So it just might happen that a component furnished by an apprentice ends up travelling into space on board an international space probe.

Aside from technical expertise, team building activities also play an important role. For example, all apprentices at the Institute work together on group projects, such as building a working model of a Mars rover, and take part in annual retreats.

Are you interested in our vocational training? Or do you know someone who might be? Write to us at:

Ausbildung@mps.mpg

< Launch of Solar Orbiter aboard an Atlas V rocket

The Max Planck Institute for Solar System Research is involved in four instruments on this research mission to the Sun. Some subcomponents were manufactured by apprentices at thel-institute.

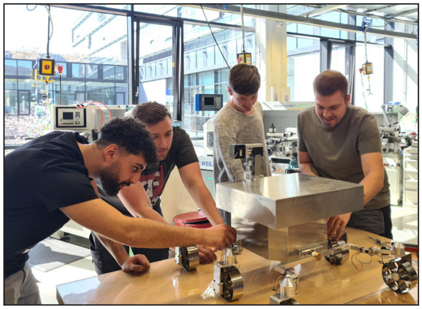
IT Specialist for System Integration

The computer center provides vital infrastructure and services for the entire Institute. Apprentices learn how to design and implement complex systems for information and communication technology by integrating software components, setting up networks, and troubleshooting problems, on a simple office PC as well as in the computer center. They also support employees from all departments in all IT-related issues.

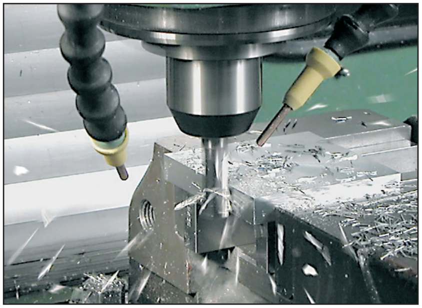
Electronics Technician for Devices and Systems

Many of the electronic components for instruments are manufactured at the Institute. In addition to acquiring a broad range of specialist knowledge, apprentices learn how to assemble circuit boards with miniaturized components and how to design electronic assemblies. The education also covers the commissioning, testing, and maintenance of assemblies.

Industrial Mechanic, Field: Precision Instrument Making



Apprentices learn both manual and machine processing of materials with an accuracy of 1/100 mm, as well as how to operate computer-aided (CNC) milling and turning machines. Each apprentice has their own state-of-the-art workstation. Training is also provided in the processing of unusual materials typical for space applications, such as titanium, tungsten, invar, and vacuum-compatible plastics.



Metalworker, Subject Area: Construction

Welding, drilling, turning, milling – in the metal workshop, apprentices learn how to cut and shape both metallic and non-metallic materials and how to machine them. Their tasks also include maintenance and expansion work on the piping systems for ultra-high-purity gases and vacuum systems at the Institute.

EQUAL OPPORTUNITIES GOOD CONDITIONS FOR CUTTING-EDGE RESEARCH

Research at the highest level requires a special environment. At the Max Planck Institute for Solar System Research, equal opportunities for all employees, a satisfactory work-life balance, and excellent career development opportunities are among the most important cornerstones.

The Institute has a bilingual daycare center that provides day care for children up to preschool age. In addition, three parent-child offices equipped with baby beds, changing facilities, toys, and more are available to employees. Assistance in finding individual childcare solutions is also offered, as is financial support if special childcare needs arise due to business trips or conferences.

The Max Planck Society's networking and mentoring programs support both young female scientists and more experienced female researchers in their career planning. For scientists who are still at the beginning of their careers, the Minerva Fast Track Program offers long-term prospects within the Max Planck Society, while the Lise Meitner Excellence Program allows exceptionally qualified scientists to establish their own independent research group.

Further informationen is available here:

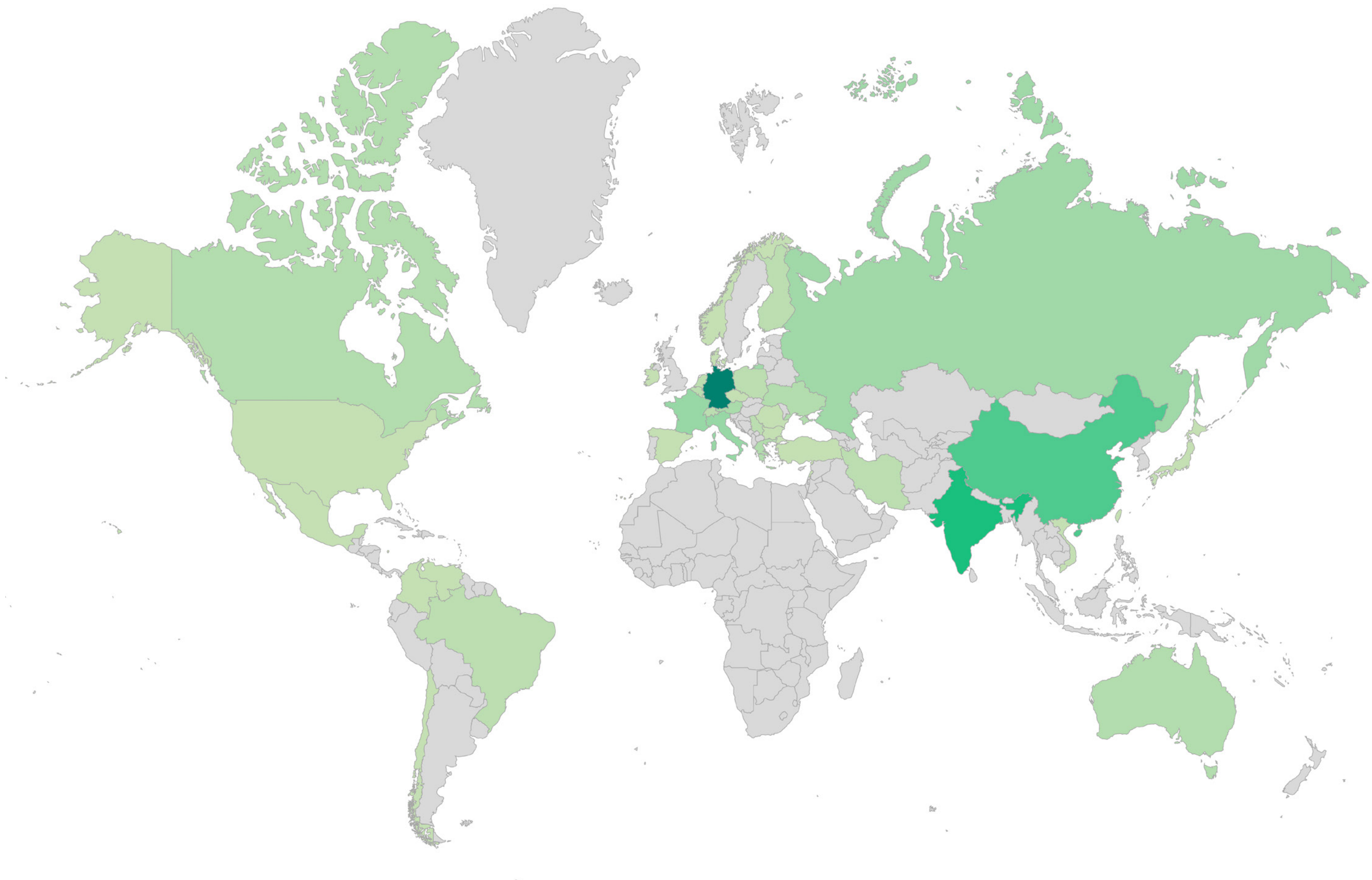
https://www.mps.mpg.de/equal-opportunities

< Kosmos Kids

For many employees and their children, the day begins with drop-off at the Institute's daycare center.

INTERNATIONAL WORK ENVIRONMENT
BRIGHT MINDS FROM AROUND THE WORLD

Approximately 150 scientists and students conduct research and study at the Max Planck Institute for Solar System Research. As the map shows, around one third of them come from Germany; the rest come from 38 countries on five continents. Countries with a high number of researchers are colored darker than those with fewer scientists.

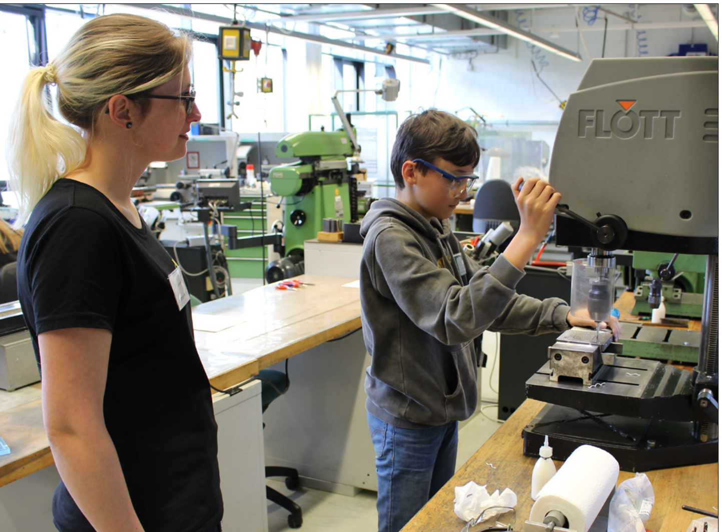


DISCOVERING THE INSTITUTE
PUBLIC EVENTS, GUIDED TOURS & MORE

There are many ways to find out more about the Max Planck Institute for Solar System Research, its research topics, and methods: guided tours of clean rooms and laboratories, public lectures on the Sun and planets, hands-on experiments at one of the many public events, and much more.

Guided Tours
On weekdays, the Max Planck Institute for Solar System Research offers guided tours for visitor groups upon request. The tours provide information about current research projects and results and take guests to clean rooms and laboratories that are not otherwise accessible to the public. The duration of the tour, the thematic focus, and the language are tailored to the needs and wishes of the guests. Please feel free to contact us at presseinfo@mps.mpg.de.

Public Events and Lectures
Whether it’s the Night of Science, Astronomy Day, or a special celestial event, there are regular opportunities to visit the Max Planck Institute for Solar System Research as part of a public event. Guests can expect a full program with lectures, hands-on activities, and more. In addition, a public lecture series takes place every year.



Further informationen is available at:
www.mps.mpg.de/public-talks-and-events

< Girls‘ and Boys‘ Day

Once a year, students can learn about the various career options at the Max Planck Institute for Solar System Research and gain hands-on experience - as seen here in the precision engineering workshop.

Launch event >

Numerous guests witnessed the launch of the space probe JUICE at the Max Planck Institute for Solar System Research. The program included a live discussion with one of the scientists at the launch site in South America.

Max Planck Goes to School

Once a year, researchers from the Max Planck Institute for Solar System Research along with their colleagues from the three other Max Planck Institutes in Göttingen visit school children. The school program "Max Planck Goes to School" offers numerous secondary school classes in Göttingen the opportunity to meet researchers in person and be inspired by their enthusiasm for research, science, and space.

Girls' and Boys' Day

Whether you want to be a precision engineer, technician, or scientist, the Max Planck Institute for Solar System Research offers many exciting career paths. On Girls' and Boys' Day, students can learn about some of these professions. Registration is required. Information on the registration process can be found at: www.mps.mpg.de/zukunftstag.

Literary Festival "Göttinger Literaturherbst"

Internationally renowned researchers, current non-fiction books, and exciting topics from cutting-edge research – that's what you'll find at the lecture series "Wissenschaft beim Göttinger Literaturherbst", which takes place every fall as part of the literary festival "Göttinger Literaturherbst". In a unique setting, the speakers present the latest findings in physics and astronomy, medicine and biology, as well as the humanities, social sciences, and economics. The series is organized by the four Max Planck Institutes in Göttingen, the Göttingen State and University Library, and the Literaturherbst GmbH.

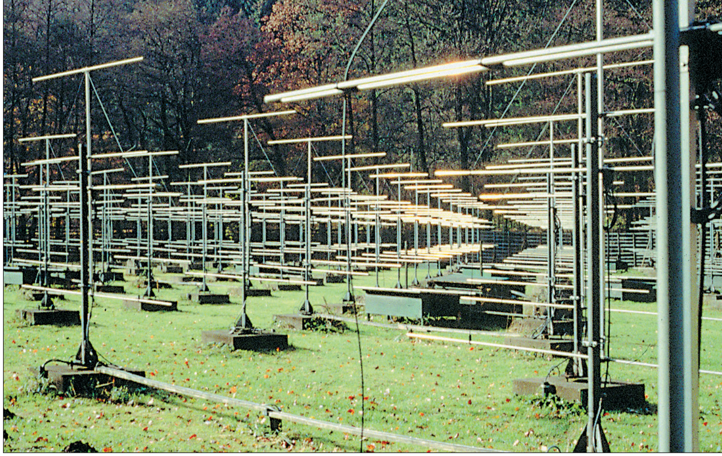
INSTITUTE HISTORY
ATMOSPHERIC RESEARCHERS AND SPACE PIONEERS

The Max Planck Institute for Solar System Research looks back on an eventful history spanning some 90 years, with relocations, new names, and structural changes. Its research focus has also shifted over time: while Earth's atmosphere was the main focus in the early decades, the researchers' interest gradually moved further and further away from Earth to the planets of our Solar System and to the Sun. Today, distant stars and their exoplanets are also studied.

The Institute has two roots. The older one goes back to Erich Regener, a pioneer of stratospheric research and space exploration. After the National Socialist government dismissed the physicist from his university teaching position in 1937, he founded a private research institution for stratospheric physics, which was incorporated into the Kaiser Wilhelm Society, the predecessor organization of the Max Planck Society, in 1938. With the help of unmanned research balloons, Erich Regener sought to decipher the composition and structure of the stratosphere and characterize cosmic background radiation. As part of the National Socialists' military rocket program, he developed the so-called Regener barrel, the first scientific payload for a rocket, which, however, was never used.

In 1948, Erich Regener's research institution was one of the founding institutes of the Max Planck Society; seven years later, it moved to Katlenburg-Lindau in southern Lower Saxony. The Max Planck Institute for Ionospheric Research had already been operating there since 1946. Its beginnings date back to the 1930s under its founder Walter Dieminger.

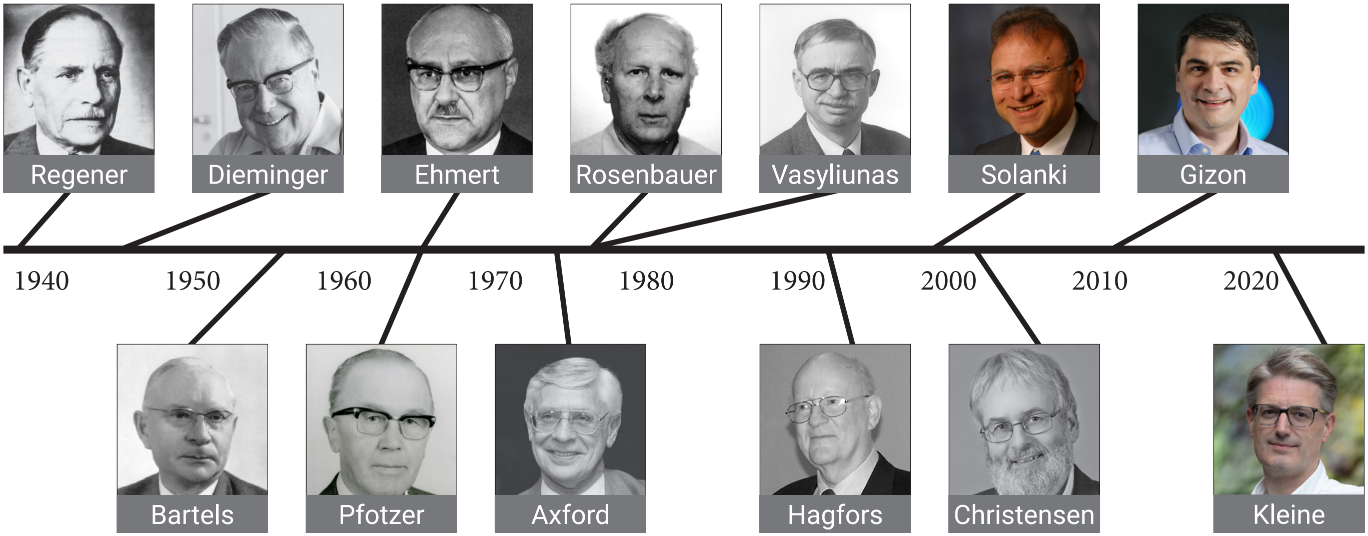
< Space probe Helios and institute's former logo
The first logo of the Max Planck Institute for Aeronomy reflects the shape of the Helios probes.



Antennas >
From 1946 to the 1970s, research into the ionosphere using powerful transmitters and antenna systems was one of the Institute's main areas of work.

While the scientific activities and management remained separate, both institutes were given the joint name Max Planck Institute for Aeronomy in 1957. The sub-institutes merged scientifically in 1975. During this period, the Institute's research focus began to expand: research projects studying the interplanetary medium, the Sun, the planets, and comets were added to the study of Earth's atmosphere. For example, the Institute contributed scientific instruments to early space missions: to Azur, the first research satellite developed in Germany, which was launched into space in 1969; to the German-American probes Helios 1 and 2, which explored the interplanetary medium in the late 1970s; and to SpaceLab, the research laboratory on board the American space shuttles. Another highlight was the Institute's participation in ESA's Giotto mission to Halley's Comet in 1986.

From 1998 onwards, the Institute's scientific work focused on solar and planetary research. In 2004, it was renamed the Max Planck Institute for Solar System Research. In 2014, it moved to its current premises near the North Campus of the University of Göttingen.



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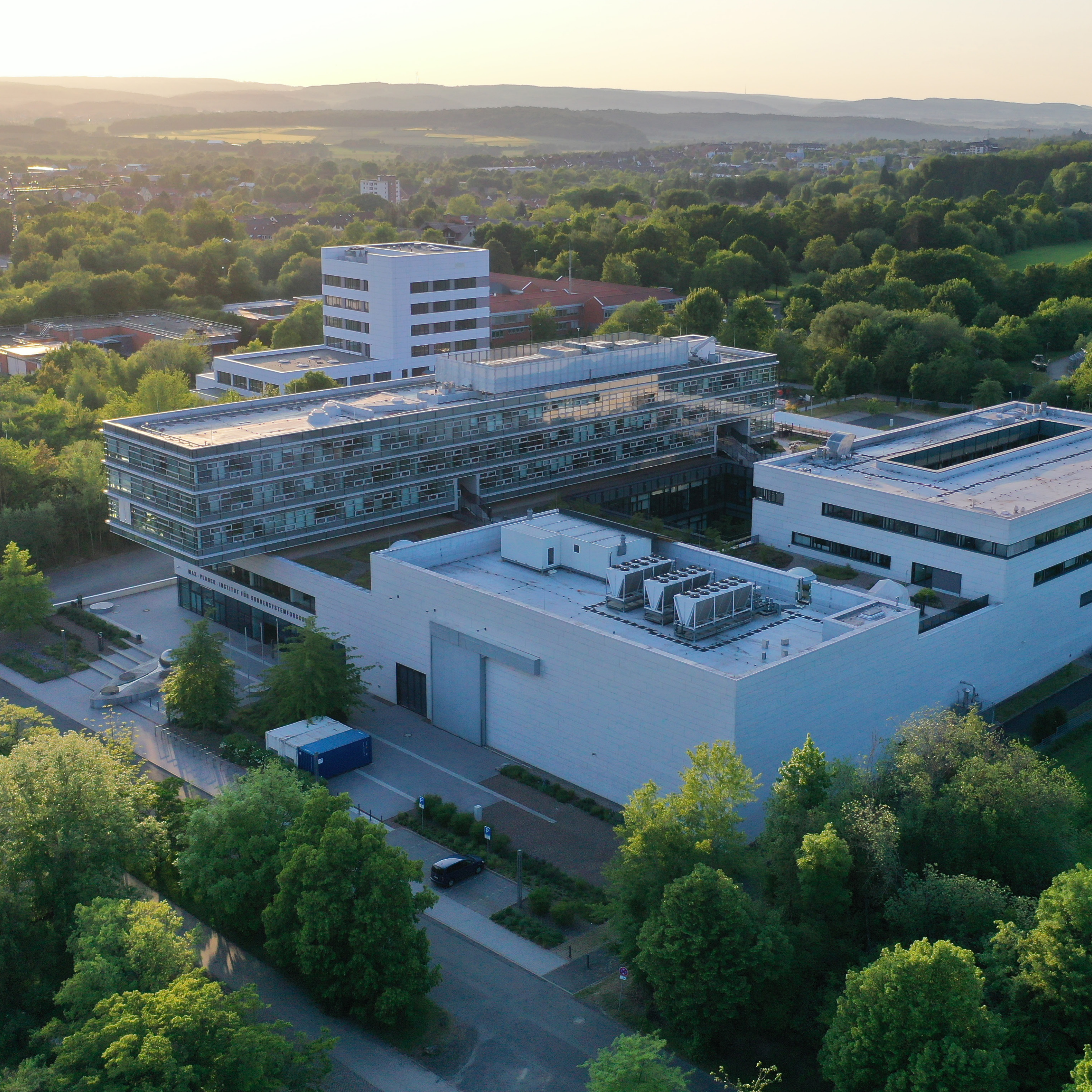
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