ARM continually strives to set new standards Land to achieve a sustainable progress – in science and research, as well as in teaching. This way Bachelor students are provided an early opportunity to work on realistic and practical space projects as for example the REXUS/BEXUS or the STERN projects.

ZARM's working environment is international and family-friendly with a high percentage of women. Moreover, ZARM is highly committed to promoting young people: It supports university projects (e.g. University activities for Kids, Summer Academies), initiates new national programs and joins international projects (e.g. DroPS, CanSat). High school children also have the opportunity to work at ZARM as interns to get an insight in our research diversity. With its support for initiatives that are especially designed for girls and women interested in the STEM topics, ZARM aims to increase the number of women participating in the areas of science, technology, engineering and mathematics.

WHAT DO WE **STAND** FOR?





Prof. Dr. Marc Avila

Prof. Dr. Claus Lämmerzahl

Prof. Dr. Claus Braxmaier APPLIED SPACE TECHNOLOG

CONTACT

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RESEARCH BENEATH THE SPIRE OF THE BREMEN DROP TOWER

Universität Bremen



WHAT IS THE ZARM?

Tor over 25 years the Center of Applied Space Technology **f** and Microgravity (ZARM) of the University of Bremen has been one of the most prominent scientific organizations in Bremen - the "City of Space". Thanks to its broad experience and expertise, ZARM has established itself as an internationally renowned institute within the faculty of production engineering, and is recognized for its excellent academic education of young scientists.

Scientists from different disciplines, including engineering, physics, mathematics and informatics conduct research within the fields of fluid dynamics, space sciences and space technology. The working groups at ZARM explore for example the behavior of fluids under conditions of microgravity, produce detailed computer simulations of space systems and work on the implementation of satellite missions. With this interdisciplinary approach, and its unique Drop Tower, ZARM is a recognized partner for international cooperation.



.THE BEHAVIOR OF GASES, LIQUIDS AND FIRE UNDER SPACE **CONDITIONS!**

ZARM scientists of the field of **fluid dynamics** conduct experiments in the Drop Tower, in space shuttles and on the ISS in order to predict the behavior of liquid hydrogen, which is used as rocket fuel, is investigated in ZARM Drop

The behavior of fire is also very different in space, and ZARM researchers have

WHAT IS OUR RESEARCH **ABOUT?**



... ULTRACOLD ATOMS!

Two ZARM scientists of the field of space technology

ferometry in Microgravity) the scientists created the in using it for interferometry experiments. Bose-Einstein condensates are formed when a gas is cooled down to almost absolute zero. (



...THE PRINCIPLE OF EQUIVALENCE!

One of the ZARM groups of the field of space sciences is testing one of the foundations of Einstein's general theory of relativity: the equivalence priniciple. The satellite mission MICROSCOPE intends to analyze the equivalence principle experimentally with unmatched accuracy. This principle claims that on Earth – when in vacuum – all objects fall at the same speed regardless of their material. may have been wrong, and pave the way for alternative physical theories.

WHAT ELSE DOES **THE ZARM OFFER?**

he 146-meter high ZARM Drop Tower is not **I** only a technological landmark of Bremen but unique in Europe, and offers scientists from all over the world the possibility to conduct experiments in microgravity. The Drop Tower's 9.3-second test duration is the longest in the world, and is a costeffective and permanently accessible option for experimentation under space conditions.

Furthermore, ZARM operates the largest centrifuge in Europe which enables tests, and certifications of aerospace structures and prototypes under conditions of increased gravity.

Finally, in the in-house thermal vacuum chambers and the vibration test laboratory, space components can be tested under realistic settings. These diverse ZARM test facilities can help ensure in advance that components will be fully functional in space.