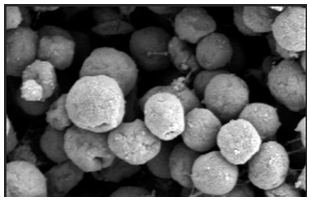
CONTENT

RESEARCH

BIOLOGY

Methanogenic microorganisms as workhorses of the industrial bioeconomy

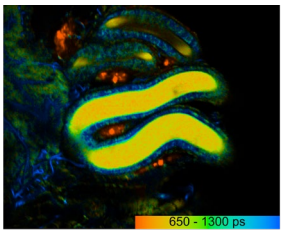
MethanoPEP - is the name of the new joint project starting in February 2020, which focuses on the further development of methanogenic microbes as platform organisms in biotechnology. Coordinated by **Prof. Dr. Michael Rother** from the Institute of Microbiology, the project will be pursued in cooperation with scientists from Kiel University, the TH Mittelhessen University of Applied Sciences, the Eberhard Karls University of Tübingen and Electrochaea GmbH in several subprojects over a period of three years. The Federal Ministry of Education and Research (BMBF) is funding the research consortium with a grant of more than two million euros.



Electron microscopic image of methanogens.
© Nicole Matschiavelli

Learn more

Biologists make living sperm glow



False-colour image of the fluorescence lifetime of the metabolic coenzyme NADH in sperm (here in yellow) in a female sperm storage organ in the fruit fly. © C. Wetzker

By applying a novel method, biologists of the **Chair of Applied Zoology** have successfully analysed the metabolism of intact tissues of the fruit fly using a label-free microscopy technique. They used the natural fluorescence of certain metabolic molecules and found that sperm, compared to other tissues, are highly glycolytic. Learn more

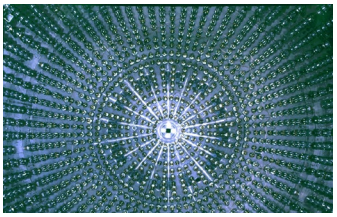
MATHEMATICS

Dependent or independent, that is the question

In December, the academic publisher De Gruyter launched its new journal “Open Statistics” with an opening article **Dr. Björn Böttcher** from the Institute of Mathematical Stochastics. The article presents the extension of the statistical measure "distance multivariance" developed by Böttcher and his colleagues. Distance multivariance is a multivariate dependence measure, which can detect dependencies between an arbitrary number of random vectors each of which can have a distinct dimension. In his new article, Böttcher now presents the concept as a unifying theory that combines several classical dependence measures. Connections between two or more high-dimensional variables can be captured and even complicated non-linear dependencies as well as dependencies of higher order can be detected. For numerous scientific disciplines, this method opens up new approaches to detect and evaluate dependencies. Learn more

PHYSICS

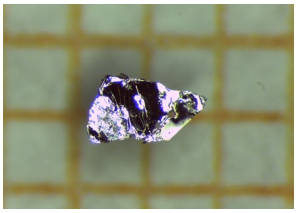
Hauntings from inner earth: Geoneutrinos provide new clues about the structure of our earth



A look in the interior of the Borexino detector. © Borexino Collaboration

The Borexino experiment in Italy, with a detector more than 1,400 metres below the earth's surface in the Gran Sasso massif near Rome, is located in the world's largest underground laboratory. For well over ten years, an international research cooperation, in which **Prof. Dr. Kai Zube**r from the Institute of Nuclear and Particle Physics is also involved, has been hunting for the so-called ghost particles: the neutrinos. In a new publication, the cooperation now presents the latest data on the so-called geoneutrinos generated in the Earth's interior, thus providing new insights into the structure of the Earth. Learn more

Scientists discover first antiferromagnetic topological quantum material



MnBi2Te4 – single crystal. © Jun.-Prof. Anna Isaeva

A large consortium of international and interdisciplinary research teams involving TU Dresden has discovered a new type of bulk quantum material with intrinsically magnetic and topological properties. The new material is called manganese-bismuth telluride (MnBi2Te4) and is extremely promising for application in antiferromagnetic spintronics and quantum technologies. **Dr. Anna Isaeva**, Junior Professor for Synthesis and Crystal Growth of Quantum Materials, and her team are significantly involved in the discovery. The results of the research work are published in the renowned journal *Nature*. Learn more

PSYCHOLOGY

More autonomy at work reduces the risk of low back pain

A team of psychologists from Technische Universität Dresden, in cooperation with experts from health sciences and the Federal Institute for Occupational Safety and Health, has carried out a meta-analysis to identify psychosocial work factors that pose a risk for the development of chronic low back pain (CLBP). Their study clearly indicates that not only physical but also psychological and social factors exert considerable influence on the development of the disease. "These data provide an important basis for the development of prevention programs," continues **Dr. Denise Dörfel**, postdoc at the Chair of Work and Organisational Psychology. "In view of the increasing burden and high costs of CLBP for individuals, employers and society, this meta-analysis provides important insights for public health and human resource management. A redesign of working conditions could reduce pain-related absenteeism. Flexible breaks, more autonomy in scheduling the work, all this reduces the workload," explains the psychologist.
Learn more

New study: Dresden as a business location is attractive for international students - but there is still a lot to do

Prof. Petra Kemter-Hofmann presented the results of the study "A perfect match? Internationals and the local industry in Dresden" during a press conference. ©Christina Schulz

Dresden is an attractive business location for international students. Graduates from all over the world would like to stay in the state capital - provided they find a suitable job. However, this is especially difficult for international students. This is shown in a new study by the Institute for Work, Organizational and Social Psychology on behalf of intap - a project of the Scientists into Business (SCiB) GmbH.The central question of the study „A perfect match? Internationals and the local industry in Dresden" was: How can the transition of international graduates into the local industry be better managed and the full potential for the regional economy be utilized? Learn more

What happens to deferred intentions in the brain?

Placing a checkmark on the to-do list is an extremely liberating feeling for many eager list lovers, especially when the task has been postponed for a long time. But what happens in our brain when we have completed a postponed task? Will it be deactivated? If so, how? A team of scientists from **the Collaborative Research Centre 940 "Volition and Cognitive Control"**, together with two leading international experts, Julie Bugg and Michael Scullin, investigated these questions in a systematic review article. Headed by **Dr. Marcus Möschl** from the Chair of General Psychology, the team analysed 20 years of research on intention deactivation and so-called aftereffects of completed intentions across different research fields. Learn more

AWARDS

"Physik-Preis Dresden" for Oxford physicist Dr. Adam Nahum

From the left: Prof. Dr. Roderich Moessner, Director at the MPI-PKS, prize winner Dr. Adam Nahum and Prof. Dr. Michael Kobel, Dean of the Faculty of Physics. ©Philipp Lindenau

On 14th January 2020, the "Physik-Preis Dresden" of the Max Planck Institute for the Physics of Complex Systems (MPI-PKS) and Technische Universität Dresden was awarded to Dr. Adam Nahum from Oxford University. "The originality of his approaches and the extraordinary diversity of his research topics ideally embody the basic idea behind the "Physik-Preis Dresden", explains Prof. Walter Strunz, Chairman of the Prize Committee, the decision in favour of Adam Nahum. The "Physik-Preis Dresden" was founded in 2015 by the Dresden physicist Peter Fulde in order to strengthen Dresden's attractiveness in the scientific landscape and, at the same time, to intensify the cooperation between the MPI-PKS and the Faculty of Physics at TU Dresden. Learn more

STAFF MATTERS

Thank you, Dr. Gerd Ludwig!

After more than 35 years of work at TU Dresden, Dr. Gerd Ludwig, Adminstrator of the Faculty of Chemistry and Food Chemistry, is taking his well-earned retirement in February. The School of Science would like to take this opportunity to thank him for his commitment, his optimism and his almost inexhaustible wealth of experience. We wish you, Dr. Ludwig, all the best for the future, health and lots of time for the good things in life.

Welcome to Dr. Philipp Schlender

Dr. Philipp Schlender will succeed Dr. Ludwig as Faculty Administrator on 1 March 2020. Since 2015, Dr. Schlender has been working as a scientific assistant in Prof. Michael Ruck's group in Inorganic Chemistry II. Grown up on the island of Rügen, Philipp Schlender studied chemistry at Clausthal University of Technology from 2004, where he alsocompleted his doctorate in 2014 and then worked as a lecturer until 2015. Dr. Schlender is looking forward to his new field of activity: "I have come to appreciate the TU Dresden and our faculty very much in recent years, and it motivates me to make my contribution to the further success of the faculty and the TU Dresden as a whole in this important position. I am very much looking forward to working together with the Dean Prof. Thomas Henle and the staff of the Dean's office."

SERVICE

Fresh look for WIL C 207

Since January of this year, the meeting room of of the School of Science in Willers-Bau, Room C 207, has been modernized with new furniture. The old furniture showed signs of wear and tear, some of it was already heavily damaged, so that the school's management decided to purchase new tables and chairs. At this point a heartfelt thank you to all those involved!

CALLS

KlarText Prize for science communication – applications possible until 28. February

"What were you doing there in your thesis?" - The answer to this question is the subject of KlarText, the Klaus Tschira Foundation's prize for science communication. The foundation is looking for young scientists who have written a very good doctoral thesis in 2018 or 2019 and are eager to explain their research to a non-scientific audience. This will be in the form of a generally understandable article written in German. The winners can look forward to receiving **5,000 euro**s each. Doctoral candidates from the fields of biology, chemistry, the geosciences, computer science, mathematics, neurosciences and physics can still submit their text contributions for the KlarText Prize 2020 **until 28 February 2020**. Learn more

Call for Science Slam „Nachhaltigkeit denken!" (Think sustainability)

How can the careful use of the valuable natural resources water, soil or waste be successfully managed? What innovative approaches are already available? What can each and every individual contribute in daily life? Anyone who knows how to answer these or other questions relating to research into the sustainable use of resources in a clear, entertaining and scientifically correct way can apply for the Science Slam "Thinking sustainably!" **on 4 June 2020** at the Deutsches Hygiene-Museum. The organizers will offer professional coaching to all newcomers to the Science Slam. There are several prizes sponsored by the DREWAG Stadtwerke Dresden GmbH.

Applications including an abstract (max. 3,000 characters) and a curriculum vitae can be submitted until **1 March 2020** via e-mail to: Anne.Geissler@tu-dresden.de

EVENTS

Starting up in life sciences with LifeTechLab

With the start-up incubation program LifeTechLab by dresden|exists, scientists and students get the opportunity to turn their life-science discovery or business idea into a solid business model. Do you have a product or business idea in the life science sector, for example a laboratory diagnostic, a screening service or a health app? Then apply for the next round of the LifeTechLab until **6 March**. Learn more

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