CONTENTS



RESEARCH

## Heat causes hormonal stress in tomato plants


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A team led by **Prof. Jutta Ludwig-Müller**, Professor of Plant Physiology, is investigating temperature-resistant tomato plants: the prolonged heat wave and its influence on the metabolism of plants is causing considerable yield losses this year. The yield from tomatoes is best in a moderate climate; temperatures that are too high reduce fruit development. In a project funded by the German Federal Ministry of Food and Agriculture, the Dresden team of biologists – in co-operation with experts from Israel – spent three years investigating the influence of high temperatures on the development of tomato plants. The goal was to develop agricultural practices that minimise heat-related yield losses. The hormonal balance of tomato plants played a particularly important role for Prof. Ludwig-Müller and her team. Their experiments demonstrated the significance of the plant hormone auxin – which decreases when subjected to heat – in flowering and fruit development. When the heat-afflicted plants were treated with the hormone, an improvement in fruit development could be observed.

## Almost like lightsabers: new quarks interactions discovered

Particle physicists at TU Dresden and international research colleagues have discovered an extremely rare interaction between quarks that can be compared to tiny lightsabers. The group is conducting research on messenger particles of so-called weak interaction, such as photons, at CERN's ATLAS Experiment in Geneva. It has now been proven that these light particles interact and can deflect each other. Photons can only interact with objects that carry an electric charge. As they are electrically neutral themselves, they move through each other – so the Skywalkers would be able to cross their lightsabers, but they would not be able to strike blows with them. By contrast, in nuclear “weak interaction”, the messenger particles scatter each other, since they themselves have a weak charge. The international collaboration in the ATLAS experiment at CERN has now succeeded in proving this scattering in two different processes. The ATLAS detector records what happens when protons collide in the particle accelerator at almost the speed of light. And yet, the observed scattering processes are the rarest of events: 20,000 billion proton collisions are needed until such a constellation occurs by chance.


The ATLAS Experiment at Cern. © CERN

## Distorted order as the key to chemical catalysis

An international team of researchers, among them **Prof. Alexander Eychmüller** from the Chair of Physical Chemistry, has solved a paradox of chemical catalysis: platinum alloys owe their high activity to their chemical composition and specially structured surfaces, as these have a distinct atomic order. For years, the disordered variants of such platinum alloys posed a contradiction to this, as they also proved to be highly catalytic. The reason: while the catalytic performance in structured platinum alloys is fed by the uniformity of the atomic groupings, in the case of non-uniform, distorted groupings in structural disorder there are isolated, particularly reactive patterns. The surface distortion takes

**WANTED: STUDY PARTICIPANTS**

**Successful social interaction and decision making**

The Faculty of Psychology is looking for participants aged 65 to 85 or 18 to 30 to take part in a study. The goal is to discover which competencies are necessary for social interactions and decisions, and how these change over the course of our lives.

**Study schedule**

2 sessions (2.5hrs + 5hrs, incl. breaks):

*Session 1*: Neuropsychological testing procedures (e.g. questionnaires, cognitive tests) and solving tasks on the computer

*Session 2*: Neuropsychological testing procedures (e.g. questionnaires, cognitive tests) and fMRI examination (working on two different tasks in the scanner to measure brain activity)

**Payment**

approx. € 64 + chance of winning a maximum of € 11

**Further information**

Chair of Clinical Psychology and Behavioural Neuroscience

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place in the course of the ageing process, the effects of which can be better understood with the help of the description newly developed by the chemists. "For the time being, this is a result of basic research," says Prof. Alexander Eychmüller of TU Dresden, "but catalysts are of course extremely important for the entire chemical industry, and also for questions relating to electromobility."

**Also in research:**

**Magnetic vortices: doubly interesting.** A team of researchers has, for the first time, discovered two independent phases of magnetic vortices (skyrmions) in a single material. As a result, the physicists of TU Munich, TU Dresden and the University of Cologne are now in an even better position to explore the properties of these magnetic structures, which are of equal interest for basic research and for applications. You can read about it here.

**Marrying topology and magnetism in a Weyl semi-metal:** a team of scientists from the Max Planck Institute for Chemical Physics of Solids (MPI CPfS), TU Dresden and other international research institutions has found evidence for Weyl physics in magnetic shandite Co3Sn2S2. You can read about it here.

**NETWORKED**

**Psychology Professor Philipp Kanske on the Board of „Junge Akademie"**

The new Board of the Junge Akademie (from left to right): Philipp Kanske, Kristina Musholt, Bernadett Weinzierl, Christoph Lundgreen (spokesperson). Not shown in the photo: Jonas Peters © The Junge Akademie/Peter Himsel

Prof. Philipp Kanske, Professor of Clinical Psychology and Behavioural Neuroscience, has been elected to the Board of the Junge Akademie for 2018/2019. Also on the Board (from TU Dresden): Dr. Christoph Lundgreen, Academic Assistant at the Chair of Ancient History, was elected Junge Akademie spokesperson. The Junge Akademie is the world's first academy for early career researchers. It opens up interdisciplinary and socially relevant creative opportunities for outstanding junior researchers from German-speaking countries. The new Board of the Junge Akademie began its one-year term of office on 1 July. During this time, it is responsible for – among other things – the academy's strategic orientation. In addition, the Board draws up the annual budget plan and supports and advises the spokesperson in representing the Junge Akademie.

**Faculty of Psychology symposium on people and emotion in the work context**

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Where feelings are an essential part of the job, the concepts of emotional labour and regulation of emotion are applied. In order to exchange and combine current findings and approaches in these areas, the Faculty of Psychology at TU Dresden organised a two-day symposium in July, initiated by **Dr. Gabriele Buruck,** on "Spannungsfeld Mensch und Emotionen im Arbeitskontext" (*The Human Being and Emotions in the Work Context).* Because in order to regulate emotional labour, you need strategies. "More often than not, as a reaction to stress, the system simply shuts down, and the individual can no longer behave in a way that is emotionally appropriate," explains Dr. Buruck from the Chair of Work and Organisational Psychology at TUD.

The result is a constant emotional dissonance: employees want to react appropriately; in the concrete work situation, however, profitability comes first. In theory, solutions are already available: the symposium served as a first step to put them into practice, in order to create optimal concepts based on these solutions. “The interdisciplinary exchange of different psychological and sociological methods and measures, as well as networking on joint projects in the professional fields of the emergency services and the police, have greatly advanced the topic of emotional labour”, says Dr. Buruck, who is delighted about the success of the symposium. “What is more, we were able to introduce our interest in psychological work structures based on the criteria of humane work into politics.”

**Exhibition on “Bionics” research workshop**

What natural phenomena form a “pool of ideas” for solving technical problems? How can the principles of natural examples be adapted and transferred to optimise technical applications?

The exhibition at the conclusion of the FLiK module “Bionics” (Research and Learning in an Interdisciplinary Context) provides answers to these and other questions related to bionics. It illustrates the results of the student research workshop in the form of posters and three-dimensional models.

In the research workshop of the FLiK module “Bionics”, a total of 9 groups of students from TUD researched biological structures and materials in order to transfer their functional principles into technical applications.

**Module Manager**: Prof. Dr.-Ing. habil. Maik Gude

**Duration**: until 26.10.2018 (building open from 7.30 am to 8.00 pm)

**Location:** foyer of the BIO (Biologische Institute, Zellescher Weg 20b)

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**Mathematician Prof. Oliver Sander dedicates himself to the use and improvement of free software**

Prof. Dr. Oliver Sander. © Dominik Pataky, CC BY-SA 4.0

Increased security risks and data protection concerns – long before the numerous attacks on the Microsoft system became known, **Prof. Dr. Oliver Sander** from the Institute of Numerical Mathematics opted for an alternative to Windows, Office, etc. However, the free alternatives are not always without problems when used in the work environment. “When you use free software, you occasionally find things that do not work,” Sander commented in an interview with the university group “Free Software -- Free Knowledge”.

“But unlike with proprietary software, you have the opportunity to make improvements yourself.” Out of personal conviction and with a great deal of commitment, he took hold of the reins and pooled interests. Thus, he collected various bugs in the software that his colleagues reported to him, looked for funding opportunities and finally awarded a contract to a software development firm to solve these problems. In July, Prof. Sander celebrated a first success of his efforts when TU Dresden’s Chief Information Officer (CIO) approved his application for financial support to further improve docx compatibility in LibreOffice.

SERVICE

**New online system Promovendus for doctoral degree procedures**

In future, all procedures relating to the doctoral degree process will be dealt with via the online system Promovendus: for example, applying for acceptance as a doctoral candidate, beginning the doctoral degree procedure and also applying for membership in the Graduate Academy. The introduction of Promovendus at our School is planned in two stages: from 10 September, the system is expected to be ready for use at the Faculties of Physics, Chemistry, Food Chemistry and Psychology. The Faculties of Mathematics and Biology, as well as the natural sciences doctorates at the DIGS-BB and IHI Zittau will follow from 1 October this year. All university professors and doctoral candidates will be informed via e-mail about the launch of the system and the changes associated with it.

Postdoc research assistants and scholarship holders at TU Dresden can use Promovendus to register as junior researchers at TU Dresden or apply for postdoc membership in the Graduate Academy. The platform is accessible within and outside the TU network via https://promovendus.tu-dresden.de with a valid ZIH user login, or alternatively with a ZIH guest login (to be applied for from the supervising university professor). All further information on doing a doctorate at the School of Science can be found at: https://tu-dresden.de/mn/postgraduales/promotion

**University health management in co-operation with Psychology**

TU Dresden has established a University health management system (*German: UGM*) for the long-term and sustainable maintenance and promotion of the health and productivity of employees and students. Under the overall control of the health service, the UGM co-ordinates numerous health-related services and measures at TU Dresden under the slogan "Gemeinsam: Fit – Gesund – Leistungsstark" (*Together: Fit – Healthy – Productive*).
A comprehensive website has been created in recent months in collaboration with the Institute of Clinical Psychology and Psychotherapy (Psychnet project, head: PD Dr. Susanne Knappe, funded by the SMWK, duration 11/2017-10/2018). The website provides students and employees with information about the health-related services and events at TU Dresden, and can be found at: https://tu-dresden.de/tu-dresden/gesundheitsmanagement. Whether you are looking for info on topics such as mental health, first aid, healthy nutrition, conflict resolution, exercise or sport – the website pools information, provides an overview of what is currently on offer and links to the respective contact persons. Do take a look!

## SOCIAL MEDIA

**Science communicated simply: at YouTube and all over the world**


On Tuesday, 3 July 2018, the School of Science hosted the TUesday Afterwork Mixer – a regular event format organized by the Diversity Management staff unit. A variety of activities and workshops on communication in everyday life, in the workplace and in science were presented under the heading "Comm-UNI-cation par excellence". One highlight was a workshop on the production of scientific explanatory videos moderated by mathematician and YouTube star DorFuchs, where a clip was produced on the question: "Why can you only see one side of the moon from Earth?"


Three people – three countries – three carreers.
Three regional ambassadors who carry the idea of TU Dresden as an attractive and international research place into the world. The TUD regional ambassedors have studied in Dresden themselves and provide information on the city as well as the university for people of their home countries interested in studying at TUD. This clip introduces three of them.

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