CONTENTS

RESEARCH

Biologists explain the genetic origins of the saffron crocus

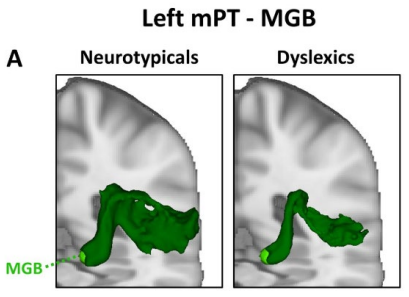
Flower of the saffron crocus with three orange carpels © TUD/Sarah Breitenbach and FISH chromosome analysis

With a price tag of up to 30,000 euro per kilogram, saffron is the most expensive spice in the world. Due to its immense value, ground saffron is frequently adulterated by the addition of substances such as pollen from other flowers. Experts therefore advise consumers to buy whole threads. The saffron crocus is a triploid hybrid species, is sterile and cannot be bred. Although it has been cultivated for more than 3,500 years, all plants cultivated worldwide originate only from daughter bulbs. For almost 100 years, there has been controversy as to the possible parent species of the saffron crocus are. If the parent species were known, changes could be inserted into the crocus genome by new breeding. It is precisely this mystery that Dresden biologists have now solved. "We have managed to understand the origins of the saffron crocus and shed light on the parent species using molecular and cytogenetic methods," says **Thomas Schmidt**, Professor of Plant Cell and Molecular Biology at the Institute of Botany. The saffron crocus therefore is descended from only one species, the wild species Crocus cartwrightianus that is found in Greece. Through saffron crocus genome sequencing and comparative chromosome analysis (Fluorescence in situ hybridization, FISH) of different crocus species, Dresden biologists were able to demonstrate that genomes of two Crocus cartwrightianus individuals with slight chromosomal differences are fused. These findings conclude the centuries-long search for the origins of this mythical plant. Read more: https://tu-dresden.de/tu-dresden/newsportal/news/raetsel-geloest-dresdner-biologen-klaeren-genetische-herkunft-des-safran-krokus?set_language=en

Neuroscientists discover neural mechanisms of developmental dyslexia

Developmental dyslexia is one of the most widespread learning disabilities. Many scientists think that the cause of dyslexia is a dysfunctional processing of auditory speech. However, even today, the reasons for these alterations in speech processing remain unknown. A long-standing assumption is that developmental dyslexia is caused by dysfunction of structures in the cerebral cortex.

Neuroscientist **Prof. Katharina von Kriegstein** from TU Dresden and an international team of experts now show in a recently published study that people with dyslexia have a weakly developed structure that is not located in the cerebral cortex, but at a subcortical processing stage; namely the white matter connectivity between the left auditory motion-sensitive planum temporale (mPT) and the left auditory thalamus (medial geniculate body MGB). "Understanding the neural mechanisms of developmental dyslexia will be decisive for the development of early diagnostics and of targeted therapies. We expect our findings to initiate major novel research endeavours in the scientific community, because they show that brain structures that have thus far been insufficiently studied may be very relevant for explaining developmental dyslexia," summarizes Prof. Katharina von Kriegstein on the success of her study. Read more: https://tu-dresden.de/mn/der-bereich/news/neuroscientists-at-tu-dresden-discover-neural-mechanisms-of-developmental-dyslexia



The figure shows the fibre connectivity between the left motion-sensitive planum temporale (mPT) and the left medial geniculate body (MGB) in green in the control group (left) and in the dyslexic group (right). © Nadja Tschentscher et al.

AWARDS

DRESDEN EXCELLENCE AWARD for Dr. Bernhard Siegmund and PD Dr. Benjamin Friedrich

Laudator Prof. Karl Leo, laureate Dr. Bernhard Siegmund and the second mayoress Annekatrin Klepsch ©Prof. Ulrich Schwarz

The city of Dresden, together with the network „Dresden – City of Sciences“, presented the DRESDEN EXCELLENCE AWARD for the second time on Saturday, 9th March. Since 2017, this Dresden Science Prize has been awarded to scientific works that are of particular relevance to Dresden's urban development and urban society or that strengthen the development of urban projects scientifically. **Dr. Bernhard Siegmund** from the Dresden Integrated Center for Applied Physics and Photonic Materials (IAPP) received 9,000 Euro for his excellent dissertation He convinced the jury with his work on "Novel Optical Concepts for Organic Photovoltaics and Photodetection". The 12,000 Euro award in the habilitation category went to **PD Dr. Benjamin M. Friedrich** for his habilitation thesis "Nonlinear dynamics and fluctuations in biological systems" in Theoretical Physics. He is one of the 25 main researchers of the new Cluster of Excellence "Physics of Life" (PoL) and research group leader at the Center for Advancing Electronics Dresden - cfaed of TU Dresden. 19 women and 27 men had submitted their bachelor's, diploma or master's theses as well as their dissertations and habilitations to the Dresden Office of Economic Development by the deadline of 10 November 2018. The application for the 3rd DRESDEN EXCELLENCE AWARD 2019 is already underway. The application deadline is 10 November 2019. Further information: www.dresden.de/excellenceaward

From left to right: M.Sc. Anton Kirch, TUD Rektor Prof. Hans Müller-Steinhagen and Dr. Martin Schwarze. © IAPP/ Kai Schmidt

Honour for illuminating research for the future

During the 26th Photonics Colloquium at the Dresden Integrated Center for Applied Physics and Photonics (IAPP), the Emanuel Goldberg Prize of the Robert Luther Foundation and the Harry Dember Prize of the Center for Applied Photonics e.V. were awarded on March 12, 2019. Dr. Martin Schwarze and M.Sc. Anton Kirch were honoured with the awards for the best scientific work in the field of photonics of the previous year. **Dr. Martin Schwarze** received the Emanuel Goldberg Prize of the Robert Luther Foundation, endowed with 2,000 euros, for his thesis "From Molecular Parameters to Electronic Properties of Organic Thin Films: A Photoelectron Spectroscopy Study". In his work, he investigated the electronic structure of various organic materials using the method of photoelectron spectroscopy**. M.Sc. Anton Kirch** was awarded the Harry Dember Prize of the Center for Applied Photonics e.V. for his master thesis "Excitation Wavelength Dependent Response of a Biluminescent-Fluorescent Emitter Blend", endowed with 1,000 Euro. In this 1.0-rated paper, he investigated organic-luminescent systems with respect to their emission, depending on the wavelength of the excitation. The colloquium ended with a lecture entitled "Materials for a Better Life" by Prof. Rodrigo Martins of the New University of Lisbon. Prof. Martins is also President of the European Academy of Sciences.

Nuclear Physicist Prof. Kai Zuber as MTA Guest Professor in Hungary

Prof. Kai Zuber. © privat

Prof. Kai Zuber from the Institute of Nuclear and Particle Physics has just completed a four-month guest professorship of the Hungarian Academy of Sciences (MTA) at the Institute of Nuclear Research ATOMKI in Debrecen. With the Distinguished Guest Fellowship Programme, the MTA aims to strengthen the global competitiveness of Hungarian research groups and to attract the best minds in their respective fields to Hungary. An honour for **Kai Zuber**, who is internationally known and respected as a nuclear and astrophysicist. The collaboration between the ATOMKI Institute for Nuclear Research and the Dresden Felsenkellerlabor, whose scientific director is Prof. Zuber, has existed for a long time. The MTA guest professorship has enabled this cooperation to be further intensified. The focus of Zuber's stay in Hungary, however, was on teaching: with a workload of 16 hours per week of lectures and an additional colloquium in Budapest.

STUDIES

"Studi-SPRiNT-Programme" of the LEONARDO-BÜRO SACHSEN is out now

The free intercultural event series „Studi-Sprint-Programme by the LEONARDO-BÜRO SACHSEN is aimed at all interested students of TU Dresden. Please note that all workshops are in German. Here is a small programme excerpt:

28.03.2019: Country workshop: Living, working and studying in **Japan.** Registration until 22/03/2019

06.04.2019: Country Workshop: **China.** Registration until: 28/03/2019

11.04.2019: Country Workshop **India.** Registration until 04/04/2019

27.04.2019: Country Workshop: **Russia.** Registration until 19/04/2019

Registration, information and further events at: https://www.leo.tu-dresden.de/

Contact: studi-sprint.leosachsen@tu-dresden.de

WELCOME AT THE SCHOOL OF SCIENCE

Prof. Tobias A. M. Gulder is new Chair of Technical Biochemistry

Prof. Tobias Gulder © TUM

Tobias A. M. Gulder holds degrees in Chemistry from the University of Würzburg (Diploma 2004, PhD 2008). After postdoctoral training at the Scripps Institution of Oceanography with Bradley Moore (2008-2010) he started his independent work as a Liebig and Emmy Noether fellow at the University of Bonn (2011-2014). In 2014 he accepted to offer to join the Technical University of Munich as Professor of Biosystems Chemistry at the Department of Chemistry and the Center for Integrated Protein Science Munich (CIPSM). In 2019 he became the Chair of Technical Biochemistry at the Technical University of Dresden. Tobials Gulder is interested in the structure, biosynthesis and synthesis of bacterial natural products. This includes the elucidation of new biosynthetic transformations and their application to the biocatalytic synthesis of natural products as well as the manipulation of biosynthetic pathways to generate new molecular structures. Since 2019, Tobias Gulder is the Chair of Natural Product Reports of the Royal Society of Chemistry, UK.

OUTREACH ACTIVITIES

International Masterclasses in Particle Physics

The 15th International Masterclasses (IMC) of Particle Physics, headed by Prof. Michael Kobel and coordinated by Dr. Uta Bilow, started on 7th March. The IMC are an annual event of seven weeks comprising 15,000 young participants from 225 locations in 55 countries, making the Masterclasses one of TU Dresden's most international projects. The IMC give 16 to 18 years old students the chance to slip into the roles of particle researchers, analyzing particle collisions at CERN under scientific guidance and with the help of visualizations applied in research. Dr. Uta Bilow not only manages the international organisational work, the constant scientific updating of the data sets and measurement tasks, but also the IMC at TU Dresden. This year, the TUD IMC will take place on 20th March with over 100 youths from Dresden and its surrounding areas.

Masterclass Mathematics

How do soap bubbles match mathematics? This and other mathematical questions were investigated by 63 pupils of the 7th grades from Dresden and the surrounding area in the context of the 6th masterclass in mathematics. On three Saturdays in March, the "young masters of mathematics" had the chance to participate in six interesting lectures held by experts from science as well as practice with topics that are barely covered in school. The event series is organised by Dr. Björn Böttcher from the Faculty of Mathematics. He aims to trigger enthusiasm for the subject in junior mathematicians by lively lectures with experiments, discussions, single as well as group work – demonstrating that mathematics can be so much more.

SERVICE

Innovations in the online survey tools for your course

TU Dresden provides various tools for performing online surveys (access via ZIH login). Since the end of 2018, live surveys in courses can be carried out through a TUD application of invote: https://invote.tu-dresden.de. Surveys from invote.de or tud.invote.de can be transferred (see the e-learning logbook's blog post). Online surveys can be created via LimeSurvey whose updated version is available since the beginning of 2019: https://bildungsportal.sachsen.de/umfragen/. The previous version will be available parallel to the new version in 2019. Surveys required beyond this point of time need to be transferred to the new LimeSurvey version (see quick guide, German only).

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Editing: *Nicole Gierig, Public Relations*
Contact: *Nicole.Gierig@tu-dresden.de, Tel. 0351 463 39504*