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NOBELPREISTRÄGER ZU GAST AN DER TU DRESDEN

Hörsaalzentrum, Bergstrasse 64, 01069 Dresden

Trapped light particles, shrinking kilogrammes and molecular engines for joyrides through the body – these are the topics which three Nobel laureates will be applying themselves to during the 2018 public lecture series »Nobel Laureates at TU Dresden«. It will be the third year in a row that this lecture series, which is organised by the School of Science, will bring Nobel laureates to TU Dresden. At 7 p.m. on 11th and 18th April and again on 27th June, Stockholm laureates will be sharing their award-winning and current research projects in the Audimax – along with the spirit of the Nobel Prize!

On **11th April,** in his lecture »Ein neues Kilogramm im nächsten Jahr und was das mit meinem Nobelpreis zu tun hat« (*A New Kilogramme Next Year And How This Is Linked To My Nobel Prize*), Physics Nobel laureate **Klaus von Klitzing** will pursue the topic of a kilogramme stored near Paris. Can Klitzing's discoveries about the quantum Hall effect solve the problem of the shrinking of the international prototype of the kilogramme? On **18th April,** we'll be going on a molecular joyride with chemist **Ben Feringa** in his lecture »The Art of Building Small«. In 1999, together with his team at the University of Groningen, he built the first light-driven micro-car made of molecules, deployable in the body as, for example, a carrier of medicine. On **27th June**, **Serge Haroche** will speak on »Quantum information experiments with Rydberg atoms: from fundamental tests to applications«. The ingenious experiment, trapping a photon in a box and investigating the collision of light and matter, earned him the Nobel Prize in Physics.

All those interested in »Nobel Science« are cordially invited to attend the public lectures. Please register for the events at tu-dresden.de/mn/nobel

The lecture series is a School of Science event and is sponsored by *Novaled, KBA-Sheetfed Solutions AG & Co. KG, Hotel Taschenbergpalais Kempinski and the Association of Friends and Sponsors of TU Dresden e.V.*

Invitation: Future Lab 4 – "Im Alleingang oder vernetzt?" (*Alone or part of a network*?)

The next Future Lab is all about co-operation: on 26th April 2018, seven topical discussion circles will focus on different aspects of collaboration: how can collaboration between faculties and departments be promoted? Is there a common identity of the research institutions at the science location Dresden? What lies behind the lack of willingness to exchange ideas? How can teaching collaborations with DRESDEN-concept, universities of applied sciences or companies succeed? How much sharing (devices, platforms, services) do we need?

The Future Lab is open to all lecturers, students and staff of TU Dresden and the DRESDEN-concept institutions.

Thursday, 26th April 2018, 9:30 am to 1:30 pm

Ballroom Dülferstraße

Information and registration at:

tu-dresden.de/zukunftslabore

Invitation: Opening of the exhibition "Women in Math"

13 women, 13 stories: the exhibition "Women in Math throughout Europe - A Gallery of Portraits" will be telling these stories during the 2018 summer semester in Willers-Bau.The exhibition is intended to motivate young women to get involved in mathematics – by showing inspiring role models, depicted in photography and interviews, who share their life stories and their career paths in mathematics. The exhibition opens on 17th April with a welcome address by Prof. Hans Georg Krauthäuser, Vice Rector for Academic and International Affairs, and a keynote speech by Dr. Sara Azzali from the University of Potsdam, who initiated the exhibition. Classical music performed by staff and students of the Faculty of Mathematics, and coffee and biscuits round off the event.

All staff and students are cordially invited.

17th April, 2 pm in room C207, Willers-Bau

The exhibition can be viewed in Willers-Bau during the whole of the summer semester.

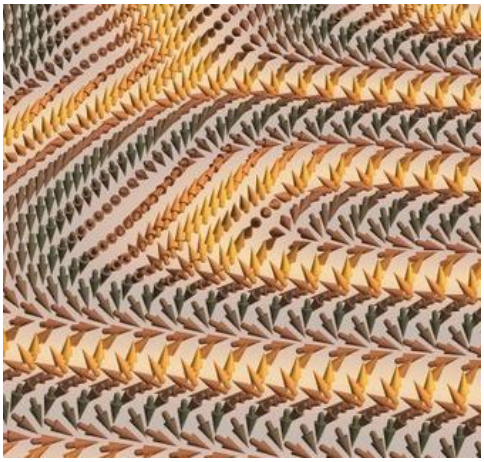
ACADEMIC AFFAIRS OFFICE

Selma now online for Chemistry and Food Chemistry

The online student portal selma (short for „self management“) was launched for all students, teaching staff and applicants of the Faculty of Chemistry and Food Chemistry at the beginning of March. The study programmes of chemistry and food chemistry along with those of biology are now in the league of the first programmes of the campus that use selma in all its functions. The portal is currently on a pilot run. It enables students to organise their studies completely in one place, from registering for courses to printing certificates. The data import for all three study programmes of Chemistry/FC took more than two weeks. Instructional training for the Faculty's administrational staff on handling selma is planned in the near future.

RESEARCH

Magnetic Walls Cause a Stir

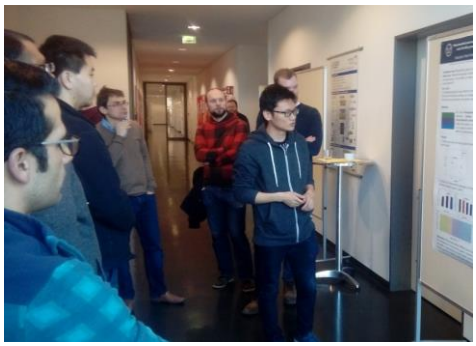


Domain walls separate areas of different magnetisation orientations from each other. In helimagnets, these magnetic moments are twisted into a helix. © Markus Garst

The “domains” of ferromagnetic materials are the areas in which the local magnetic moments point in the same direction. Usually there are many domains in a ferromagnet with different magnetisation orientations; they are separated from each other by domain walls.

Researchers at TU Dresden working in an international team have identified new domain walls in helimagnets. In these, the magnetic moments are not aligned in the same way, but are twisted into a helix. This leads to a periodic repetition of the magnetic structure, analogous to crystalline order. The magnetisation on these walls is twisted in such a way that magnetic vortices, skyrmions, are formed. These are currently under intensive research: manipulation by electrical currents is of interest for possible applications.

“We achieved the results in a collaboration of theory and experiment,” says Dr. Markus Garst from the Institute of Theoretical Physics at TU Dresden. “Our group contributed theoretical calculations and interpretations of the experiments as part of Laura Köhler's doctoral thesis.” The experimental work was carried out by a group led by Prof. Dennis Meier as part of Peggy Schoenherr's doctoral thesis at the Swiss Federal Institute of Technology Zurich.



Ruijian Guo (Applied Zoology) presenting his poster at the „GAMEETING“. © Veronika Magdanz

Meeting of Scientists on Germ Cell Research

The germ cell, the beginning of life, united an otherwise rather small research community in a one-day meeting on 27th February 2018. Taking up the invitation of Prof. Rolf Jessberger (Institute of Physiological Chemistry), Dr. Veronika Magdanz and Prof. Klaus Reinhardt (Applied Zoology), scientists from Dresden with a research focus on germ cells (gametes) congregated at the “GAMEETING” at TU Dresden's Faculty of Biology. The lectures dealt with topics such as pre-meiosis – the status before chromosome duplication – in fish, spermatogenesis in humans and mice, sperm chemotaxis (concentration gradient) and metabolism in insects and sea urchins, as well as with clinical questions on *in vitro* fertilization, sperm robots and the development of sperm prostheses by the current Leibniz Award winner Oliver Schmidt. Among the participants were scientists from various Dresden institutes.

GUESTS

“Mehrwert” Project: Visiting Professor Dr. Martina Erlemann

New ideas through diversity: this is the goal of “MEHRWERT durch mehr Perspektiven” (*Added value through added prospects*). The pilot project integrates gender and diversity aspects into STEM research in order to demonstrate new inspiration and methodological possibilities on an interdisciplinary level. Three guest professorships will introduce the topics of more diversity in research into the lecture halls. Dr. Martina Erlemann from Freie Universität Berlin has been appointed to the School of Science. A sociologist and physicist, she is also collaboration coordinator of “gender-Dynamiken. Fachkulturen und Forschungsorganisationen in der Physik” (*Gender dynamics. Subject cultures and research organisations in physics*). In the summer semester, she is offering the seminar "Zwischen Tafel, Computer und Labor: Physik als Wissenschaftskultur” (*Between blackboard, computer and lab: physics as a culture of science),* which is open to physics students in Bachelor's and Master's degree programmes, and the seminar “Gender Studies für Mathematik und Naturwissenschaften (*Gender Studies in Mathematics and the Natural Sciences*) for students of all subjects in the natural sciences, humanities and social sciences.

The kick-off event for the project "MEHRWERT durch mehr Perspektiven" will take place on 27th April 2018 in the Festsaal (*Ballroom*) Dülferstraße.

SPONSORING PUPILS

Youths Chasing Higgs Particles and Jelly Bears: Masterclasses in Physics and Mathematics

In March, 150 pupils immersed themselves into mathematics and physics beyond the horizon of schools' curricula. The annual masterclasses of TU institutes are giving youths the opportunity to research topics that are not part of school lessons. About 90 senior students from all over Saxony were hosted by the Institute of Nuclear and Particle Physics, gaining insights into the world of tiniest particles and current research questions in this area. They analysed data from the particle accelerator at the CERN in Genf, finishing the day as junior researchers with a video conference exchange with two researchers at the CERN, as well as students from Brazil, Denmark, Poland and Czech Republic. "The day was very informative and exciting to me", found Nina Koch from the Freie Waldorfschule Leipzig. "Partly, it has been very much information, but I felt well introduced into the matter."

Focussed on particles: Nina (links) and Paula analyzing data from the ATLAS experiment. © Anne Rockstroh

Workshops and lectures on traffic models, shafts and linear systems of equations with Gauss algorithm were the topics that taught the 60 participants of the mathematic masterclass a new perspective on maths: with "Gummibärenforschung" (*jelly bears research*), insights into the "Zauber der Zahlen" (*numbers' magic*) and the interplay of mathematics and art. The events were spread over three dates with two lecturers each, coming from all over Germany and passing on their dedication for maths via presentations, experiments, discussions, team and single work.

100 Metres Above the Beginnings of the Universe: TUD Students Explore CERN

On the first weekend in March 2018, 42 students from TU Dresden went on an expedition close to Geneva: during the annual CERN trip of the Institute of Nuclear and Particle Physics (IKTP), they explored the European Organization for Nuclear Research, travelling on roads with names such as "Marie-Curie", "Route Einstein" and "Route Schrodinger". 100 metres below them: the Big Bang, or at least the attempt to decipher the subsequent development of the universe. In the world's most powerful particle accelerator, magnets chase protons and ions to the edge of the speed of light until they collide – in small big bangs that take researchers back to the Big Bang for a fraction of a second. Where does mass come from? Does supersymmetry exist? What is dark matter? Over the course of two days, the IKTP students came closer to a little piece of the beginning in the world's largest research centre. Shortly after the excursion, the organiser Steffen Turkat, a PhD candidate in nuclear physics at the IKTP, received various applications for bachelor's theses: one of the echoes of the fascination of this world of particle and nuclear physics, matter and antimatter research.

Every year, the IKTP organises the excursion to CERN for students who have just completed the 5th semester lecture »Kern- und Teilchenphysik« (*Nuclear and Particle Physics*). The excursion is sponsored by the Association of Friends and Sponsors of TU Dresden e.V., the Students' Council and the Faculty Students' Council. The report in the UJ issue 7/2018 (publication date: 17.04.2018) invites you on a mental, high-energy journey to CERN.

The students at this year's IKTP CERN excursion, in front of the „Globe of Science and Innovation" at CERN. © IKTP

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