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Dear Readers,

The first Excellence Newsletter of the year is full of diverse topics, exciting events and important research results of the Cluster of Excellence and Research. The year 2020 promises much excitement and we look forward to regularly keeping you up-to-date about the coming Excellence activities.

From proposal to reality

The Excellence Proposal “TUD 2028 – Synergy and Beyond” is being implemented with great enthusiasm. “We strive to be **one of the five best performing German universities** in the long term while **significantly increasing our international visibility and competitiveness**,” commented TUD Rector Prof. Hans Müller-Steinhagen at an event on 3rd February 2020 (German presentation for TUD members).



To achieve this ambitious goal together, 13 projects with 40 measures are to be implemented within the **five strategic fields of activity: Talent, Profile, Collaboration, Impact, and Spirit**.

The **EXU Office** is the **central coordination point** of the University of Excellence (EXU) funding line. Here, the individual threads of **programme management** are interwoven. The concrete design and implementation is carried out directly by those responsible for the measures and their teams in close cooperation with the responsible members of the University Executive Board.

DRESDEN-concept has four new members

The Fraunhofer Institute for Machine Tools and Forming Technology (Dresden branch) (IWU) and for Process Engineering and Packaging (IVV), as well as UNU-Flores and the Papiertechnische Stiftung Heidenau became new associate members of DRESDEN-concept.

DRESDEN-concept now has 32 members and, since the foundation of the association ten years ago, **seventeen new partners** have joined the research alliance, greatly improving its visibility.

10-year milestone for DRESDEN-concept

When the DRESDEN-concept association was founded in 2010 by 15 research institutions in Dresden, it was not clear what success this alliance would bring:

Two titles of Excellence for TU Dresden, which ushers in an influx of excellent researchers and students for the entire science location, as well as a 50% **increase in third-party funding** from collaborative third-party projects.

The joint publication rate rose by 29% and the **number of partners doubled in time for the anniversary year**. Numerous projects, jointly used infrastructures, an extended range of courses and a science hub with better networking than ever before have emerged from the DRESDEN-concept alliance and offer fertile ground for further activities.

DRESDEN-concept is commemorating this success with a **big celebration on 10th October 2020** in the [Deutsches Hygiene Museum](#) and with numerous events.

New TUD Young Investigators appointed

The TUD Young Investigator team continues to grow. In December 2019 and January 2020, the University Executive Board appointed:

- Dr. Elisabeth Fischer-Friedrich
- Dr. Oleg Janson
- Dr. Anette Eltner

The status **TUD Young Investigator strengthens the position of excellent, independent junior research group leaders** at the scientific location of Dresden through their stronger integration into the faculties and qualifications specifically tailored to their needs.

Intensive workshop “Good Doctoral Support”

The path to a doctorate is an important career step for PhD students. **Encouraging and challenging** early-career researchers **to an appropriate extent** is one of the demanding tasks of the university teaching staff.

Good doctoral supervision not only has a decisive influence on the success of the individual doctoral project, but also on **the future scientific potential of universities**.

With the aim of supporting the supervisors in this important task, the [Graduate Academy](#) is once again offering a one-day **intensive workshop on the topic of “Good Doctoral Support”**, exclusively for professors of all disciplines.

The workshop will take place on **3rd April 2020**. Interested parties can register by [email](#).

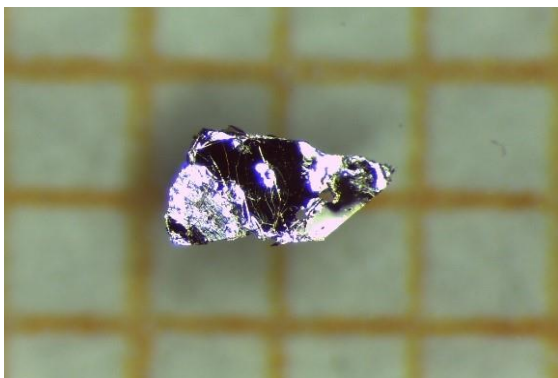
DFG visits PoL



The new year in the Cluster of Excellence **Physics of Life (PoL)** started with a visit by representatives of the funding agency **German Research Foundation (DFG)** on 10th January 2020.

The guests of the DFG had the opportunity to talk to the university management and the members of the Cluster of Excellence. Scientific presentations at the **Center for Molecular Bioengineering (B CUBE)** and a **guided tour of the Virtual Reality CAVE** at the **Center for Systems Biology Dresden (CSBD)** offered an exciting framework for the visit.

Novel quantum material discovered



A large consortium of international and interdisciplinary research teams, including TU Dresden, **IFW Dresden** and **Julius Maximilian University of Würzburg** as part of the Cluster of Excellence **ct.qmat**, has discovered a novel **quantum material with intrinsic magnetic and topological properties**.

The new material is called **manganese bismuth telluride (MnBi₂Te₄)** and is considered to be the first **antiferromagnetic topological insulator (AFMTI)**.

The results of the research have been published in the renowned journal **Nature**.

cfaed: Call for open topic postdoc positions

The **Center for Advancing Electronics Dresden (cfaed)** is still committed to fundamental research for future electronics and electronic technologies.

With newly installed postdoc positions ([more information and application form](#)), cfaed seeks to **promote collaborations and research projects** that translate results from its excellence cluster period to **application-orientated research** and insights with the potential for further **collaborative research**.

Chemical circuits for use in the medical field

As part of the German government's **High-Tech-Strategy 2025**, the **Federal Ministry of Education and Research (BMBF)** is funding an **interdisciplinary research group** that aims to use an innovative circuit technology to solve a central problem of genetic investigation of human single cells.

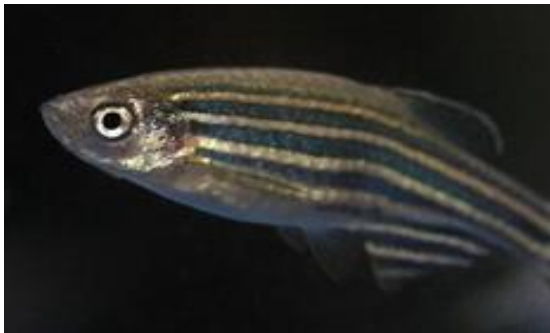
Medical professionals hope that such research will drastically **improve the diagnosis and therapy of many serious diseases** and enable the **treatment of or even a cure for cancer and immune diseases**, for which there are currently no suitable methods available.

However, this will require molecular analysis systems that can examine hundreds or thousands of these cells individually and simultaneously. Current technology does not allow for such analyses.

Scientists in Dresden would therefore like to use [chemo-fluidic circuits](#) developed at the [Center for Advancing Electronics Dresden \(cfaed\)](#).

“Census” in the brain of the zebrafish

The zebrafish is a master of regeneration: if it loses brain cells due to injury or illness, it can simply reproduce them. Due to its evolutionary relationship with humans, it possesses the same cell types that are present in the human brain.



Researchers in Dresden have succeeded in using a “census” in the brain to determine **the number and type of newly formed nerve cells in zebrafish**. Their formation in high numbers and their integration into the nervous system after injury are the reason for their amazing **ability to regenerate**.

For their study, the team led by Prof. Michael Brand from the [Center for Regenerative Therapies at TU Dresden \(CRTD\)](#) used adult transgenic animals in whose forebrain they were able to identify the newly formed neurons. “We hope that this will provide us with important insights into potential **therapies to help people after injuries, strokes, and in cases of neurodegenerative diseases,**” said Prof. Michael Brand, Director of the CRTD and senior author of the study.

Rejuvenating cure for the brain

Researchers at the [Center for Regenerative Therapies at TU Dresden \(CRTD\)](#) have found that increasing the number of brain stem

cells in ageing mice helps to regain **cognitive functions such as learning and memory**, which are lost during the course of ageing.

To this end, the [research group of Prof. Federico Calegari](#) stimulated the stem cells in the brains of ageing mice in such a way that the amount of these stem cells increased, and with it the number of brain cells produced from them. The team observed that these **additional neurons survived and even made new contacts with neighbouring cells**.

A further finding was that the **stimulation of the brain stem cells** in young mice ensures that their **memory performance is relatively well preserved over the entire course of life** and that cognitive impairments occur without delay.

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