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RESEARCH

Three-Parent Babies: Risks Inherent in Mitochondrial Donation

In a study, **Dr. Ralph Dobler** and **Prof. Dr. Klaus Reinhardt** (Applied Zoology) and their research group have evaluated all results on mitochondrial replacement from medicine, biomedicine, ecology and evolutionary biology that have been published so far. Mitochondria carry their own DNA, which is passed from mother to child. Mutations in this genetic material can lead to serious diseases. In mitochondrial donation or mitochondrial replacement therapy, doctors transfer the nucleus from the maternal egg cell – before or after artificial insemination – into an enucleated egg cell from a donor whose mitochondrial DNA is presumed to be intact. The effects of this therapy on the resulting "three-parent babies" are not yet known. In their study, Dobler et al. detected moderate to severe effects of mitochondrial replacement on parameters such as health, development or reproduction. For the first time, the researchers were able to carry out a risk assessment that showed one in 59 to 130 children may experience unwanted and currently unpredictable side effects.



OLEDs: brighter and more durable thanks to ultra-stable glasses

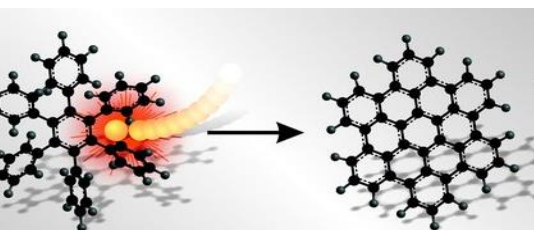
At the moment, higher performance in organic light-emitting diodes (OLED) technology can only be achieved through material development. Scientists from the Universitat Autònoma de Barcelona and from TU Dresden, among them **Prof. Sebastian Reineke** and **Dr. Simone Lenk** of IAPP, have now introduced a possibility for improving the performance of OLEDs through the formation of ultra-stable glasses. Efficiency and operational stability for four different phosphorescent emitters are significantly increased (on average > 15%). To achieve this, the emission layers were grown as ultra-stable glasses. This growth condition allows for thermodynamically most stable amorphous solids. Using this approach, the development of thermally activated delayed fluorescence (TADF) emitters in particular can be advanced. You can find the full article [here](#).



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Ball mills instead of solvents: nanographenes produced with the help of mechanochemistry

Ball mills instead of solvents – that is the approach **Dr. Lars Borchardt** and his **junior research group "Mechanocarb"** (funded by the Federal Ministry of Education and Research, BMBF) at the Faculty of Chemistry and Food Chemistry have been pursuing since 2015. They are working on an environmentally friendly method for the synthesis of nanostructured carbon materials for use in electronic components and energy storage systems, namely mechanochemistry. Due to their unique electrical, thermal and mechanical properties, nanographenes are considered a very promising material for applications in electronics, sensor technology and energy storage. However, because of their poor solubility, production is expensive and damaging to the environment. The research group has succeeded in employing the strong mechanical forces in ball mills to stimulate chemical reactions in which a hexaphenylbenzene precursor can be converted into a completely aromatic system – such as the nanographenes. This simple, safe and sustainable alternative to chemical synthesis opens up new paths: "We will also apply this method to completely insoluble molecules," says Borchardt. "This will allow the production of graphene nanoribbons on a scale relevant for application, in a short time and needing only a few steps in the synthesis." Read the full article [here](#).



The mechanical energy of the milling balls allows solvent-free and sustainable nanographene structures to be synthesised in ball mills © Sven Grätze

EVENTS

Tuesday Afterwork Mixer

CommUNICATION – that's the guide idea of the School of Science's Tuesday Afterwork Mixer on 3rd July.

Employees as well as their families and all interested parties are warmly welcome in this program of open, creative communication. Be inspired to better express your concerns: in everyday worklife as well as in your personal environment.

Tuesday, 3.7. 2018, 5 p.m. – 9 p.m. in and around C207, Willersbau

Please register at nicole.gierig@tu-dresden.de



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By contributing to new knowledge, through synergies in scientific disciplines and in society, and with outstanding teaching, we strengthen excellence in our School and beyond. This is where you come in: please share new developments in your Faculties, Institutes and Groups with us – we look forward to hearing from you:

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PROFESSORIAL APPOINTMENTS

Prof. Ralf Schützhold, "W3" Professorship for Theory of Non-Equilibrium Phenomena in Solids or Plasmas

Prof. Ralf Schützhold, along with being appointed Director of Theoretical Physics at the Helmholtz-Zentrum Dresden-Rossendorf (HZDR), has also been appointed the W3 Professorship for the Theory of Non-equilibrium Phenomena in Solids or Plasmas on 1 April. In doing so, he has returned to the university where he first came to study and where his physics career began. As a theorist, he is particularly interested in strong field physics, and it is as a theorist that he now links the Dresden-concept partners HZDR and TU Dresden: "The high-power lasers DRACO and PENELOPE are about quantum electrodynamics in extremely strong fields. As regards HIBEF, the Helmholtz International Beamline for Extreme Fields at the X-ray laser European XFEL, I am fascinated by the experiments related to vacuums that will be possible there," says Prof. Schützhold, broaching the issue of research advantages at the HZDR which are intended to create excellent synergies with the Faculty of Physics.



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School of Science TU Dresden @TUD_Science · 12. Juni

Am Donnerstag startet die #Fussball-WM in Russland. Die Gewinner stehen derzeit noch in den Sternen. Nicht so für unsere #Mathematiker von der Professur für #Wahrscheinlichkeitstheorie. Sie sind sich sicher: "Deutschland ist der eindeutige #WM-Favorit."



Dresdner Mathematiker sicher: „Deutschland de...

Wissenschaftler der TU Dresden haben die Endrunde der Fußball WM 2018 durchgerechnet – und das mehrfach 100000 Mal.

sz-online.de



Student Research Expo 2018

Showcase your research!

At the Student Research Expo, students, from early-state through to doctoral students, present their research within a poster exhibition. 45 contributions from all 5 Schools of the TU will be exhibited in the HSZ (central lecture hall), in poster presentations as well as in 90-seconds pitches with a subsequent exchange.

Wednesday, 4.7. 2018, 15–20 p.m.

HSZ (posters in the foyer, pitches in lecture hall 3)

30 years of "Advanced Materials": Chair of Molecular Functional Materials organises AM30 Symposium

To mark the 30th anniversary of the first issue of specialist journal Advanced Materials, the Chair of Molecular Functional Materials (**Prof. Xinliang Feng**) at TU Dresden is hosting an AM30 symposium in co-operation with the AM editorial team. Dresden thus joins the ranks of cities such as Beijing, Boston and Singapore, where further symposia are taking place. Every week, Advanced Materials publishes research breakthroughs across the boundaries between physics, chemistry and biology, making it today's forum for highest-level results from interdisciplinary materials science. The Dresden AM30 Symposium takes place on **16 and 17 July 2018 at the Festsaal (Ballroom) Dülferstraße**. It will focus on the topic "**Advanced Carbon and 2D Materials**", showcasing excellent scientific work from this field. Please register at:

<https://cfaed.tu-dresden.de/am30>

EXCELLENT

CHE-Ranking: Top scores for Chemistry and Mathematics

In the recent 2018 Centre for Higher Education (CHE) University Rankings, Chemistry and Mathematics achieved top results, with Physics and Biology not far behind. Students of Chemistry at TU Dresden are very pleased with the general situation in their subject, the organisation of studies, and the imparting of subject-specific and methodological competences. In addition, Chemistry, Biology, Mathematics and Physics were ranked among the leaders in the "Graduations in an appropriate time" category. Furthermore, Mathematics reached a similar top position in the category "third-party funds per academic". Mathematics and Physics received top rankings for the international orientation of their Master's programmes, with Mathematics also being given top marks for its organisation of studies.



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Outstanding dissertations awarded prizes at the IAP

In their 2017 dissertations, Dr. Simonas Krotkus and Dr. Yoonseok Park succeeded in bridging the gap between basic research in physics and solution-oriented applications. Their reward: sharing the 2018 Robert Luther Foundation's Emanuel Goldberg Award, which is endowed with 2,000 euros.



Mona Kliem and Edvard van Sielegthem: Dember Prize winners 2018 © Landowski/IAPP

Mona Kliem and Edward van Sielegthem share the Harry Dember Prize of the Center for Applied Photonics (ZAP), endowed with 1,000 euros.

The prizes were presented at the 25th Dresden Photonics Colloquium on 20 April at TUD's Institute of Applied Physics (IAP), by invitation of the Robert Luther Foundation and the ZAP.



Dr. Simonas Krotkus (3rd from left), 2018 Goldberg Award winner. Dr. Park, now in Chicago, took part in the event via video conference – a novelty. Landowski/IAPP

Online self-assessment for prospective students: "Online Self-Assessment (OSA)" project

An online self-assessment test for prospective and new students is the goal of the "Online Self Assessment (OSA)" project. Its intention: making the choice of degree programme a well-informed decision, getting rid of false expectations and unknown requirements, and reducing the number of students dropping out of their courses of study. Through working on tasks and answering questions by themselves, students are to be made aware of whether their individual competences, interests and expectations correspond to the requirements and contents of the desired degree programme. At the [OSA portal](#), which – in addition to the self-assessment test – provides information on various aspects of studying at TU Dresden, the test for electrical engineering will be available from 01.09.2018. There are plans for further tests for other degree programmes: the first of these, an OSA for the mechatronics degree programme, will be developed from September 2018.

Publisher: Prof. Clemens Kirschbaum, Chairman for the School of Science. Office hours by prior arrangement: Wednesdays, 9.30 to 10.30 a.m., Tel.: 0351 463 37512.

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