

October 30, 2019

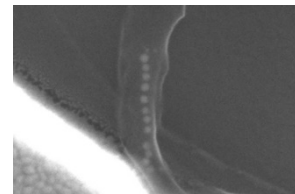


Latest News

Highly Efficient Magnetic Computers

A suitable culture medium, some heat and the computer grows all by itself: a processor made of special bacteria could process considerably more data for the same size than its silicon counterpart. Scientists from the Materials Chain at the University of Duisburg-Essen (UDE) report in the journal Nature Communications about their discovery of magnetic oscillations inside bacteria.

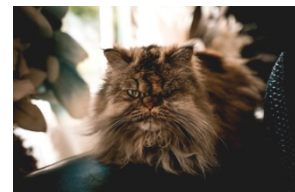
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Quantum-level Light-matter Interaction

Researchers have succeeded in fusing light and matter at the quantum level. They have created a state similar to that of Schrödinger's cat in a thought experiment. In a quantum computer, information could be stored in certain matter structures, the so-called quantum dots. In order to be able to transport the information over



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certain distances, for example through fiber optic cables, it must be transferred from matter to light.

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Determining the Activity of Catalyst Particles Free of Precious Metals

Precious metal-free nanoparticles could serve as catalysts for the production of hydrogen from water. Because they are so small, their properties are difficult to determine. Materials Chain chemists have now developed a new process with which they can characterize individual precious metal-free nanoparticle catalysts.

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"Technological Sovereignty in a Future Field"

Around 120 representatives from industry and science met on 9 October for the 6th RUHR Symposium at the Fraunhofer inHaus Centre on the UDE Duisburg campus. Functional magnetic materials were the focus of the event, at which State Secretary Oliver Wittke promoted the electric car completely "made in Germany".

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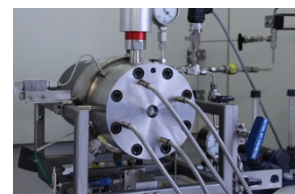


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New/Coordinated Projects

New Project to Use CO₂ as a Resource

Alcohols are a common raw material for the chemical industry. Researchers want to produce them from the greenhouse gas carbon dioxide in the future. In a single process step, the greenhouse gas CO₂ is to be transformed into valuable raw materials for the chemical industry. This is the goal of the "Elkasyn" project, which the



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Federal Ministry of Economics and Energy is funding with 2 million euros from 2019 to 2022.

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EU Twinning Project in Cancer Therapy

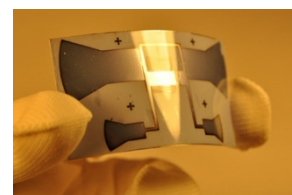
"MaNaCa" is about the targeted destruction of cancer cells with magnetic nanoparticles. But at the same time, it is a mentoring program for the Academy of Sciences in Armenia: The project on two levels, in which physicists from the Center for Nanointegration (CENIDE) of the University of Duisburg-Essen (UDE) are significantly involved, is funded by the European Union with 800,000 €.

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Ending Tetris in Logistics

The wagon is packed, once again the courier points the reader at the loading area, checking: everything on board, nothing forgotten. Printed radio labels without chips should make this possible in the future. The DruIDe* project, in which four Materials Chain members from the University of Duisburg-Essen (UDE) are playing a leading role, will not only result in a new technology, but also in two start-ups that will take care of the market launch.



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Publication Highlights

Biologically encoded magnonics

Zingsem, B.W. and Feggeler, T. and Terwey, A. and Ghaisari, S. and Spoddig, D. and Faivre, D. and Meckenstock, R. and Farle, M. and Winklhofer, M.

Nature Communications 10 (2019)

[more](#)

**Nature of Water's Second Glass Transition Elucidated by
Doping and Isotope Substitution Experiments**

Fuentes-Landete, V. and Plaga, L.J. and Keppler, M. and Böhmer, R.
and Loerting, T.

Physical Review X 9 (2019)

[more](#)

Realizing facile regeneration of spent NaBH₄ with Mg-Al alloy

Zhong, H. and Ouyang, L. and Zeng, M. and Liu, J. and Wang, H. and
Shao, H. and Felderhoff, M. and Zhu, M.

Journal of Materials Chemistry A 7 10723-10728 (2019)

[more](#)

**Toward a Paradigm Shift in Electrocatalysis Using Complex
Solid Solution Nanoparticles**

Löffler, T. and Savan, A. and Garzón-Manjón, A. and Meischein, M.
and Scheu, C. and Ludwig, A. and Schuhmann, W.

ACS Energy Letters 4 1206-1214 (2019)

[more](#)

[See all publications](#)

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