

February 29, 2020



## Events

### Latest Information

Dear Materials Chain members,

In this issue of our Infomail we want to remind you to save the date for the next Materials Chain International Conference, **MCIC 2020**. It will take place from **November 25 to 26, 2020** at Ruhr-Universität **Bochum's** convention centre. You are welcome to share the information.



We also have the pleasure to introduce to you our scientific committee which support the thematic design of the conference. The committee consists of experts in the field of our **5 core conference topics**, which reflect the range of materials research from atoms to products within the UA Ruhr:

1. 2D and hybrid functional materials  
**Manfred Bayer** (TU Dortmund)  
**Gerd Bacher** (UDE)
2. Materials for energy conversion  
**Malte Behrens** (UDE)  
**Kristina Tschulik** (RUB)
3. Data driven and combinatorial materials science

**Alfred Ludwig** (RUB)  
**Tillmann Hickel** (MPIE)

4. Metals, alloys and magnetism

**Michael Farle** (UDE)  
**Sebastian Weber** (BU Wuppertal)

5. Production engineering and additive manufacturing

**Stefanie Hanke** (UDE)  
**Petra Wiederkehr** (TUDo)  
**Jan Sehrt** (RUB)

Ideas and suggestions to the scientific board and organizing team are highly welcome.

## Media

### Materials Chain - The Movie

Self-healing plastics, magnetic cooling, shape memory alloys - these are the new characteristics of the transformed Ruhr area. The region is establishing itself across the board in research on modern materials: 273 scientists from the three major universities and their working groups work together in the Materials Chain: A short movie now presents the huge research network.

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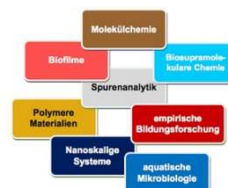
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## Latest News

### WISNA Professorships Announced

Within the Federal and State Programme for the Promotion of Young Scientists, the Faculty of Chemistry at the University of Duisburg-Essen (UDE) has announced two junior professorships with tenure track: "Structural Analysis of Inorganic Materials" and "Nanomaterials in Aquatic Systems" Applications are accepted until 9 March.

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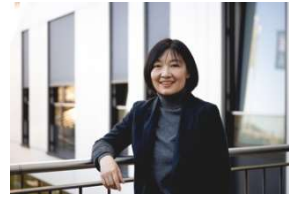


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## **Tong Li Appointed Professor at Ruhr-Universität Bochum**

Tong Li wants to make catalyst development more efficient. In addition to catalyst materials, aerospace materials are also in the focus of the researcher, who accepted a professorship in February 2020. In order to develop high-performance catalysts, not only good production processes are required, but equally good methods to characterize the potential catalysts.

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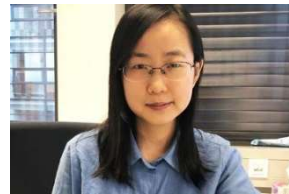


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## **Dr. Guannan Liu's Flaming Research**

Nanoparticles are the number one topic of conversation in many areas of the engineering and natural sciences. Humboldt Fellow Dr. Guannan Liu is investigating their formation in flame synthesis. She is currently a guest of Prof. Christof Schulz at the Institute of Combustion and Gas Dynamics at University of Duisburg-Essen.

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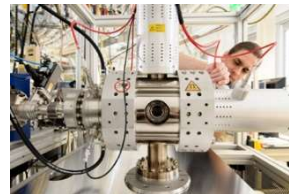


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## **MERCUR will be Continued**

The Mercator Research Center Ruhr (MERCUR), founded ten years ago by the Mercator Foundation and the universities of the UA Ruhr, will receive a further 22 million euros for the next five years. This will further expand the successful cooperation between TU Dortmund University, Ruhr Universität Bochum and University of Duisburg-Essen through funding programmes. The Mercator Foundation is supporting the activities of MERCUR with 11 million euros. The universities will provide the co-financing.

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## **New/Coordinated Projects**

### **Easy Application of Catalysts**

Electrocatalysts can help to obtain chemicals from renewable raw materials or to use alternative energy sources. Researchers at Ruhr-Universität Bochum (RUB) and University of Duisburg-Essen (UDE) have developed a new method of applying catalyst particles to tiny electrodes. The method is inexpensive, simple and quick to implement.

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## **Immunotherapy through Nano Tools**

Together, scientists from medicine, biology and chemistry at the University of Duisburg-Essen (UDE) are now pursuing a new and visionary approach to combating oncological diseases. In the joint project headed by Prof. Sven Brandau, nano-tools are to be developed that switch off cancer-promoting immune cells within tumours. Deutsche Krebshilfe is funding the precision immunotherapy project with 800,000 euros over three years.

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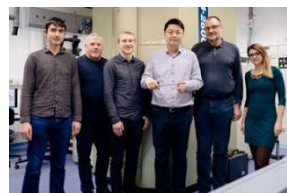
## **TU Dortmund University Researchers Efficiently Generate Light with Magnetic Nanoplates**

Nanoplates are chemical systems that emit light and can be used in light-emitting diodes, for example. Together with international colleagues, researchers at TU Dortmund University have succeeded in turning the platelets into strong magnets, allowing the properties of the light emitted by the nanoplatelets to be controlled in a targeted manner. The team published the results in the renowned journal Nature Nanotechnology at the end of January.

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## **Fast Screening for Potential New Catalysts**

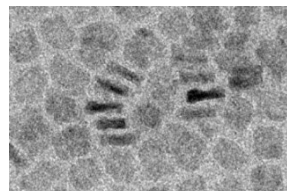
The success of the energy transition depends significantly on efficient electrocatalysts, for instance for fuel cells or the reduction of CO<sub>2</sub>. Special alloys made from five or more elements are promising



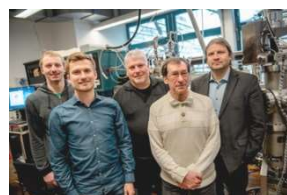
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candidates. A team of researchers from Ruhr-Universität Bochum (RUB) has developed a concept in order to quickly screen an abundance of possible element combinations to identify which are worth optimising.

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## **Ammonia as a Sustainable Energy Source**

A little water, some nitrogen from the air, and electricity from the wind farm: ammonia is made up of readily available raw materials, and it is understood as a green energy source. Highly efficiently, hydrogen can be produced from ammonia to generate usable energy. Scientists at the University of Duisburg-Essen (UDE) and the Zentrum für BrennstoffzellenTechnik GmbH (ZBT) are developing an innovative plant for this purpose: the ammonia cracker.

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## **Awards (Congratulation!)**

### **Best Teacher Award for Prof. Monika Schleberger**

On January 25, Prof. Marika Schleberger from the Faculty of Physics of University of Duisburg-Essen (UDE) was honored with the Best Teacher Award of the NanoEngineering course of study. The certificate was handed over during the graduation ceremony of the Faculty of Engineering at UDE.

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## **Publication Highlights**

**On the atomic solute diffusional mechanisms during compressive creep deformation of a Co-Al-W-Ta single crystal superalloy**

He, J. and Zenk, C.H. and Zhou, X. and Neumeier, S. and Raabe, D. and Gault, B. and Makineni, S.K  
*Acta Materialia* 184 86-99 (2020)

[more](#)

**Enhanced antibacterial performance of ultrathin silver/platinum nanopatches by a sacrificial anode mechanism**

Abuayyash, A. and Ziegler, N. and Meyer, H. and Meischein, M. and Sengstock, C. and Moellenhoff, J. and Rurainsky, C. and Heggen, M. and Garzón-Manjón, A. and Scheu, C. and Tschulik, K. and Ludwig, A. and Köller, M.

*Nanomedicine: Nanotechnology, Biology, and Medicine* 24 (2020)

[more](#)

**A six-compound, high performance gasoline surrogate for internal combustion engines: Experimental and numerical study of autoignition using high-pressure shock tubes**

Mai, L. and Zanders, D. and Subaşı, E. and Ciftiyurek, E. and Hoppe, C. and Rogalla, D. and Gilbert, W. and Arcos, T.D.L. and Schierbaum, K. and Grundmeier, G. and Bock, C. and Devi, A.  
*Fuel* 261 (2020)

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