

Starting signal for a new generation of catalysts

New joint research platform of the Helmholtz-Zentrum Berlin and the Max Planck Society starts operation

The Helmholtz-Zentrum Berlin (HZB) and the Max Planck Society (MPG) are launching CatLab, their new joint catalysis research centre in Berlin. The inauguration ceremony took place on June 21st in the presence of Dr. Stefan Kaufmann, the Innovation Officer for Green Hydrogen at the Federal Ministry of Education and Research (BMBF) and Member of the federal Bundestag. High-ranking representatives from science, government, and industry took part.

Hydrogen is a key building block for the energy transition to be successful. However, for this versatile energy medium to really be sustainable, it must be produced using renewable energy. At the same time, new sustainable technologies are needed for processing green hydrogen into industrial feedstock. The processes required for this have something in common: they cannot be carried out using conventional catalysts – a new generation of catalytic processing is required. This is precisely the core mission of CatLab. The aim of the catalysis research centre is not only to develop novel, tailor-made catalysts using thin-film technologies and readily available chemical elements and compounds, but also to redesign the necessary catalysis equipment. This effort should produce the innovative breakthroughs needed to build a sustainable hydrogen economy.

To achieve this, HZB and the two Max Planck institutes, the Fritz Haber Institute (FHI) and Institute for Chemical Energy Conversion (MPI CEC), are pooling their expertise and establishing the Catalysis Centre together with university and industrial partners. CatLab is intended to build a bridge between basic research and industry through funding of around 58 million euros provided by the BMBF as part of the National Hydrogen Strategy. The five-year development project involves more than 100 million euros in total.

Dr. Stefan Kaufmann, Member of the Bundestag and Innovation Officer for Green Hydrogen, emphasised: “We need top-level research to make Germany number one in hydrogen technology. The Helmholtz Association and the Max Planck Society are pooling their expertise in the CatLab Catalysis Centre and working together with industry right from the start. This is an ideal setting for innovative leaps in hydrogen technologies. With these innovative leaps “made in Germany”, and with our reputation as an innovative country, we can become a highly competitive pioneer of climate-neutral economic activity!”

Prof. Robert Schlögl, Scientific Director of FHI and MPI CEC, emphasised the timeliness: “With our in-depth understanding of catalysts and material synthesis at FHI and CEC, HZB's expertise in thin-film technologies, and the capability of conducting tightly integrated research on site with the HZB BESSY II synchrotron, this constellation gives us a unique opportunity to advance the new field very quickly. CatLab will take our ability to design high-performance catalysts to a new dimension. We will be able to rapidly translate basic research findings into a much-needed technology push.”

Prof. Bernd Rech, Scientific Director of HZB, said: “We will contribute a lot of know-how we have developed in researching thin films for solar cells at HZB. And BESSY II has already contributed essential insights into the understanding of catalysts. We have been working with catalysis researchers from all over the world for many years. All of this helps us to achieve critical mass with



the collaboration we have now launched through CatLab. With strong involvement from Humboldt Universität zu Berlin and the Berlin Cluster of Excellence UniSysCat, as well as early participation of partners from industry, we will contribute significantly to the design of a future sustainable energy system.”

Background to CatLab:

CatLab focusses on developing and producing novel thin-film catalysts. This new generation of catalysts is expected to operate more efficiently than previous catalysts. Functional systems of thin films should be able to be individually adapted to the respective reactions. This approach also requires novel design of new reaction and production equipment. In this way, the new generation of catalysts should produce innovative leaps for realising sustainable hydrogen technologies.

The proximity of BESSY II, HZB's synchrotron source integrated in the HZB campus, is a key aspect of CatLab, as short loops between synthesis and analysis will greatly accelerate development. In addition, methods of digital catalysis and computer-aided modelling of complex catalyst reactions in reactor systems will be applied. Chemical reactors of various configurations required for the use of the new catalysts will be planned, constructed, and operated jointly by HZB and MPG.

Industry is involved from the very beginning with the goal of covering the entire innovation chain and generating added value for Berlin and Germany in general. For example, BASF is participating in the development and scaling-up of chemical reactors and processes. In addition, CatLab collaborates with the UniSysCat Cluster of Excellence and the BasCat Laboratory, which the Technische Universität Berlin operates together with BASF.

In close cooperation with Humboldt Universität (HU), the newly completed laboratories in HU's IRIS research building in Adlershof provide an optimal setting for the launch of CatLab. At the same time, the catalysis research centre will be expanded in several construction phases over the long term. An architectural competition has already been held for the first construction phase, and construction is scheduled to begin in 2022.

Press contact:

Dr. Ina Helms

Tel.: +49 (0)30 8062 42034

ina.helms@helmholtz-berlin.de

