



Leopoldina
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Leopoldina news

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German National Academy of Sciences

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Editorial

Dear Members and Friends of the Leopoldina,



In just a few weeks, some 400 decision-makers, experts and thought leaders from science, business, government and civil

society will converge on Berlin for the third Research Summit since 2015. Once again – as in 2015 and 2016 – discussions will focus on an issue of high societal relevance: the creation of a new culture of innovation and risk-taking. Among the participants will be members of the Leopoldina; you can read some of their thoughts ahead of the event in the following article.

The German National Academy of Sciences Leopoldina, together with the Stifterverband für die Deutsche Wissenschaft and the Commission of Experts for Research and Innovation, will be hosting the Research Summit. Our shared goal is to provide a platform for strategic orientation and decision-making. For 2017, we aim to facilitate a critical and constructive dialogue and create a forum for self-reflection, idea generation and networking – using this approach as a foundation to formulate proposals for a new culture of innovation and risk-taking. As the wide use of buzzwords such as “digitisation”, „energy transition”, “industry 4.0”, “eScience”, “globalisation”, “human resources” and “open access” makes clear, we need a culture of curiosity, research enthusiasm and entrepreneurship. We need answers that will enable us in the future to link research strength with innovative power and scientific excellence with economic growth.

I wish you a thought-provoking read.

G. J. F. H.



Otmar D. Wiestler, Peter Strohschneider, Jutta Allmendinger and Dietmar Harhoff (left to right) discuss their expectations for the 2017 Research Summit. photos: Steffen

Jänicke, Deutsche Forschungsgemeinschaft, private (2)

Third Research Summit to focus on innovation and risk-taking culture

Decision-makers, experts and thought leaders meet on 28 March

The third Research Summit (Forschungsgipfel) will take place on 28 March in Berlin. Respected members of the Leopoldina will be among the scientists and prominent figures in attendance. Looking ahead to the event, Prof. Jutta Allmendinger ML, Prof. Dietmar Harhoff ML, Prof. Peter Strohschneider ML and Prof. Otmar D. Wiestler ML share their expectations.

Dietmar Harhoff, chairman of the Commission of Experts for Research and Innovation, expects the summit will provide “fresh perspectives that challenge existing innovation management practices within companies as well as government policies on research and innovation”. From his point of view, innovation processes are not solely dependent on rapid change; open innovation also requires the involvement of the best possible partners, while new business models need to utilise large volumes of data and exploit the full potential of the internet. “Furthermore,” he adds, “start-ups are increasingly becoming concept and technology suppliers, and rapid experimentation is doing away with lengthy planning and implementation phases.”

Following on from this, Otmar D. Wiestler, president of the Helmholtz Association of German Research Centres, says: “Germany is in need of a new culture of innovation and risk-taking to make the

country even more attractive as a research location.” He also sees it as “essential” for yet more to be done in the bid for creative and talented researchers. “The goal must be to attract talent from all over the world to Germany and offer them the best possible opportunities for development here in our country.”

Jutta Allmendinger, president of the WZB Berlin Social Science Center, says, “I am looking forward to discussing how we can generate innovation – not only for society, but also with society through participatory research methods.” She is particularly interested in the question of “how we can alleviate people’s concerns about being left behind and excluded from the digital revolution taking place in education and the workplace”. “This will require,” Allmendinger believes, “commitment from actors across all sectors of society as well as reliable cooperation”.

Peter Strohschneider, president of the German Research Foundation, provides a succinct summary of the aspirations for the strategy meeting between representatives from science, industry, government and civil society: “There can be no innovation without the risk of intellectual discomfort!” (dw)

■ FURTHER INFORMATION

Lightweight concrete construction? Achievable with textile grids!

German Future Prize awarded to Dresden research trio led by Prof. Manfred Curbach ML

Is it really possible to build lightweight concrete structures that are also “economical, efficient and attractive”, as the project description claims? “Yes, these are no longer contradictory terms,” says Prof. Manfred Curbach with a smile. “Thanks to our carbon concrete, it’s now achievable.” Curbach, a member of the Leopoldina since 2013, is a civil engineer at the Technische Universität (TU) Dresden. Together with Prof. Chokri Cherif and Prof. Peter Offermann, he has developed a concrete composite that heralds a new era in construction – one of imaginative, lightweight yet robust concrete buildings.

The reason for concrete’s generally bulky appearance lies in the fact that it is usually combined with steel. Reinforcing concrete with steel mesh increases the material’s tensile strength. But steel rusts over time, so a thick concrete coat is required to protect the mesh for as long as possible. After a good 50 years or so, however, air and water find their way in through cracks and corrode the steel mesh – despite its concrete shell. Once this occurs, the affected buildings have to undergo costly renovations. Construction engineers have long been searching for an alternative material that would eliminate this flaw. Experiments were carried out with wood and later with short glass fibres, but the results were far from satisfactory.

The solution was eventually hit upon by Peter Offermann, a textile engineer at TU Dresden. He turned to carbon fibres, connecting them using a special stitch-bonding technique that has been in use in the Saxon textile industry since 1949. In the GDR, both the manufacturing process and the material it produces were known as “Malimo”. “The basic principle and the machinery are actually borrowed from the Malimo technique,” explains Curbach. To create the textile-reinforced concrete, carbon fibres are woven together to form an open lattice around which the concrete is set. Thus, the same technique once used to weave curtains is now used to strengthen concrete. Offermann carried out the first trials in 1993; one year later, Curbach arrived in Dresden. After years spent constructing bridges for a Nuremberg engi-



The German Future Prize went to the Dresden-based trio Peter Offermann, Manfred Curbach and Chokri Cherif (left to right). The scientists from the TU Dresden have developed a form of textile concrete that uses carbon fibres for reinforcement instead of steel mesh. photo: Ansgar Pudenz / Deutscher Zukunftspreis

neering firm, Curbach wanted to return to research and teaching. At this point in time he was unfamiliar with textile-reinforced or carbon concrete. One of his first tasks was to assess Offermann’s trials. “I was excited!” says the Dortmund-born engineer. “It was clear to me that this was the breakthrough.” And for this reason, Curbach decided to stay in Dresden.

So just what was it that convinced him? A simple look at the facts and the trial results: Carbon does not corrode, so the thick concrete shell usually required to protect the reinforcing mesh can be dispensed with – ultimately saving 50 percent of material. Less concrete means less cement, which is good news for the environment as cement production releases almost three times as much carbon dioxide as all air traffic. In addition, the bearing capacity of carbon is around six times that of steel. And, last but not least, the newly developed concrete composite has a higher density and is more durable. According to Curbach, “a lifespan of 200 years is not an unrealistic vision”. Together with Peter Offermann, he pushed the project forward. “Neither one of us could have really advanced without

the other,” says Curbach, reflecting on the early stages. The German Future Prize (Deutscher Zukunftspreis) was presented to the Dresden-based trio by Federal President Joachim Gauck in late 2016, providing momentum for the next stages. The team is extremely proud to have won this award. Manfred Curbach is particularly delighted that the prize went to a civil engineering project, as construction in Germany is not exactly considered an innovative sector – especially when concrete is involved. The team constantly had to combat the material’s negative image, Curbach explains, adding in its defence that it is not concrete’s fault people made ugly buildings out of it.

This innovative carbon concrete opens up possibilities for more elegant, contoured structures. Curbach describes pavilions and houses with curved surfaces, extremely thin and yet incredibly robust – like egg shells. Even warehouses could undergo a creative makeover thanks to the new material: “Why do warehouses always have to look like a shoebox? We could now make them seem beautifully weightless!” Just imagine the industrial parks of the future... (cwe)

THE FEDERAL PRESIDENT’S FUTURE PRIZE

The Deutscher Zukunftspreis – The Federal President’s Award for Innovation and Technology, is awarded annually to projects that

display research excellence and commercial potential. In November last year, the prize was awarded for the 20th time. (dw)

“Cultural uneasiness cannot be outlawed”

Guest article by Chairman of the German Ethics Council Prof. Peter Dabrock ahead of the symposium “Do we need to redefine genetic engineering?” on 14 February in Berlin

BY PROF. PETER DABROCK*

The 2016 buzzword “post-truth” is likely a term that many from the scientific community would use to describe what they have experienced for decades in the field of genetic engineering – particularly green genetic engineering. Scientists have spent years assuring sceptics that the environmental risks associated with transgenic plants are limited and controllable, and that these plants could, in fact, make a valuable contribution to solving the problem of global food security. And yet the world – or Europe at any rate, and Germany in particular – seems to respond with ingratitude. The greater the efforts made to convince, the more these arguments have been met with emotional and politicised opposition: a classic post-truth situation.

Many scientists would also certainly admit that, in retrospect, serious communication errors have been made and that, as far as economic concomitants are concerned, almost everything that could go wrong has gone wrong. Thus, it seems there is little to no hope that green genetic engineering could ever find social acceptance again in Europe or Germany – let alone regain trust. However, many scientists see the new debate on the use of genome editing in plant breeding as almost ludicrous in nature. Because it seems that now, after all the frustrating clashes of the past decades, they may have actually discovered the “Columbus’ egg” of genetic engineering – namely, a method whereby the end product can be obtained much less arduously than by traditional cultivation practices and without permanent transgenic alteration. The result is genome-edited products that are, to an extent, no longer distinguishable from those produced by conventional breeding methods.

And yet the critics remain unsatisfied. On the contrary, it is precisely in this indistinguishability that they now see the serious underlying problem. Genetic engineering will always be genetic engineering. This new method, they say – which is also not yet controllable – could give rise to manipulations with as yet incalculable risks. It therefore needs to be subject to particularly stringent controls. Whatever possibilities genome editing offers, they



Should plants produced with molecular biological breeding methods be considered “genetically modified”? That is a question raised by the use of genome editing in plants. photo: fotolia

are unnatural!

But, the scientists respond, what exactly are the criteria of “naturalness” that the critics are basing their argument on? Is nature only that which is untouched and unchanged? That sounds more like romanticism than science. In fact, as the scientific community points out, not only do mutations occur frequently in nature, but evolution itself is nothing more than an uninterrupted series of mutations with selective effects. These mutations could occur, naturally (!) at various loci in the genome and spread to related species. So, they ask, wherein lies the problem? And, again, all they seem to hear is post-truth rhetoric echoing around the debating chamber.

So how are things to proceed from here? Debate – fierce debate – is indeed necessary. And certain rules need to be adhered to in the process, outlined in the following lexical order: Firstly, regulations are there to be observed, but also potentially to be changed should the need arise. It must therefore be recognised – and this counts as the second rule – that yes, caution is required in the face of risk, but also that those who want to demonstrate that a real risk is present have the burden of proof on their shoulders. This burden of proof is particularly heavy when a product of genome editing cannot be distinguished from a product of traditional plant breeding methods. Thirdly, cultural

uneasiness cannot simply be outlawed. Perhaps, therefore, rules need to be found that address this uneasiness while still observing points one and two. Throughout all of this, the most important thought to bear in mind is: We are responsible for our actions, but also for the actions we prevent against our better judgment. Perhaps in the debates to come on genome editing, we can at least succeed in not allowing ourselves to fall into the post-truth trap.

* Peter Dabrock is Professor of Systematic Theology at Friedrich-Alexander-Universität Erlangen-Nürnberg and has been chairman of the German Ethics Council since 2016.

SYMPOSIUM IN BERLIN

The Leopoldina, the German Ethics Council and the German Research Foundation will host a symposium on “Do we need to redefine genetic engineering?” in Berlin on 14 February. Its objective is to debate whether organisms modified using genome editing should be considered “genetically modified” and regulated accordingly. The event will focus on plant breeding and examine the definition of genetic engineering found in the German Genetic Engineering Act. (jk)

■ FURTHER INFORMATION

Science academies to advise G20 leaders

Under the leadership of the Leopoldina, recommendations for combating chronic and infectious are being prepared / Dialogue forum set for March in Halle

When the heads of state and government of the 20 leading industrialised and emerging nations gather in Hamburg, on 7 and 8 July 2017, for their annual summit meeting, the scientific community will be included in the G20 process for the first time. As a key civil society actor, it is responsible – under the auspices of the Science20 dialogue forum – for preparing scientific input on health policy, which is an important focus of the summit.

Under Germany's G20 presidency, the National Academy of Sciences Leopoldina is leading this process. As in the run-up to 2016 G7 summit in Schloss Elmau, the Leopoldina is giving the science academies of the G20 countries a platform for holding in-depth discussions on science-related issues and for developing joint policy recommendations. Advice and analysis from the scientific community will therefore also enrich the policy debates at the Hamburg summit.

This year's Science20 dialogue forum is focusing specifically on how to deal with chronic and infectious diseases. Under the title "Improving Global Health: Tools and Strategies to Combat Communicable and Non-Communicable Diseases", forum participants will discuss the different measures being taken globally to prevent and control non-communicable diseases such as cancer, diabetes and cardiovascular illnesses, and the links between chronic and infectious diseases.

In order to discuss and bring together the diverse ideas and different perspectives from the G20 countries, more than 40 scientists and representatives of the participating national academies met at the Leopoldina's headquarters in Halle (Saale) on 25 and 26 January. Together they identified the current



More than 40 scientists and experts attended a preparatory meeting for the G20 summit at the Leopoldina in Halle (Saale).

photo: Markus Scholz

challenges in dealing with non-communicable and communicable diseases and examined promising potential solutions, including ones that extend beyond the medical realm.

Led by Leopoldina President Prof. Jörg Hacker ML and Prof. Jürgen Schölmerich

ML (Frankfurt/Main), the meeting touched on issues such as the strengthening of public health system and the impact of social and economic factors on healthy lifestyles.

The results of the meeting will be incorporated directly into the statement of the G20 countries' national academies, a process which Leopoldina is coordinating. Prior to the meeting, a working group made up of Leopoldina members prepared a draft document to serve as a basis for the statement and circulated this document among the partner academies for comment. (chw)

DIALOGUE FORUM TO BE HELD IN HALLE (SAALE) ON 22 MARCH

In the run-up to the G20 summit, Federal Chancellor Angela Merkel will attend dialogue forums on specific thematic areas in an effort to strengthen dialogue with different civil society groups. Dialogue forums will be held with non-governmental organisations (Civil20), trade unions (Labour20), women's groups (Women20), young people (Youth20), private enterprise (Business20), think tanks (Think20) and, for the first time this year, the scientific community (Science20). The participants in these forums work with

international partners to prepare recommendations for the presidency.

The Science20 dialogue forum will take place at the Leopoldina in Halle (Saale) on 22 March 2017. Renowned scientists will present and debate the problem areas identified as critical during discussions with the national academies of the G20 countries. The dialogue forum will conclude with the presidents of the G20 academies officially presenting the joint statement to Federal Chancellor Merkel.

(chw)



G20 GERMANY 2017
SCIENCE 20 DIALOGUE

Dialogue between science and business in southern Africa



Representatives from science and research had intensive discussions at the Science-Business Dialogue Conference in Pretoria, South Africa.

photo: Monsoon Photography

From 5 to 7 December 2016, more than 120 representatives from science, business and government from 17 different countries gathered at the Science-Business Dialogue Conference in Pretoria to discuss how knowledge transfer between research institutions and the private sector could be improved. The participants in the three-day conference mainly explored topics such as early stakeholder involvement, intellectual property rights, technology transfer offices and innovative funding options. The conference, which received financial support from the German Federal Ministry of Education and Research (BMBF), was organised by the Leopoldina in close collaboration with the Academy of Science of South Africa (ASSAf).

In addition to lectures, the conference also consisted of panel discussions and interactive workshop elements. This included presenting already established and successful dialogue initiatives between science and business in southern Africa as well as discussing the possibilities that exist for replicating these. The case studies covered innovative knowledge transfer in agricultural biotechnology, mining, information and communications technology,

and public health. Prof. Himla Soodyall, the new ASSAf general secretary, used the metaphor of a marriage for the dialogue between science and business, describing it as a relationship in which both partners should deal with each other on equal footing, learn to accept each other's differences and use disagreements as an opportunity. Good collaboration between science and business is an important prerequisite for the translation of research results into new products and services and thus also for the socio-economic development of the African continent.

Speakers included Walter Lindner, the German ambassador to South Africa; Wolfgang Burtscher, deputy director-general for research and innovation at the European Commission; and Prof. Volker ter Meulen ML, former Leopoldina president.

Also involved in organising the conference, besides the main project partners, were the Network of African Science Academies (NASAC), the Global Young Academy (GYA), the Southern African Development Community (SADC) and the South African Ministry of Science and Technology. (csd)

EASAC presents reports on the circular economy in Brussels

On 30 November 2016, EASAC introduced two new reports – “Indicators for a circular economy” and “Priorities for critical materials for a circular economy” – in Brussels at the Palais des Académies of the Belgian academies. These reports by the European national science academies represent an important contribution to the circular economy debate and should help inform policy discussions and decisions at the European Union level.

After the key findings of the reports were presented – by, among others, Prof. Kristín Vala Ragnarsdóttir (University of Iceland) and Prof. Egbert Lox (Umicore, Belgium) – a panel discussion with representatives of the European Commission and various stakeholder groups was held. The discussion was moderated by Simon Wilson from the think tank Green Alliance (Belgium). (csd)

German-Israeli symposium on neuroscience

The Leopoldina and the Israel Academy of Sciences and Humanities (IASH) hosted the symposium “Brains: From Synapses, Circuits and Systems to the Clinic” in Jerusalem on 28 and 29 November 2016. Experts from Israel and Germany gathered at the symposium to discuss new discoveries concerning the functions of nerve cells and synapses and their interactions in nerve cell clusters and control circuits. Young scientists from both countries were given an opportunity to present their research via poster presentations.

The event is part of a symposium series on neuroscience that is co-hosted by the Leopoldina and the Israel Academy of Sciences and Humanities. Coordinating the symposium for Leopoldina were Prof. Peter Riederer ML, Prof. Michael Frotscher ML, Prof. Helmut Kettenmann ML and Prof. Ad Aertsen ML. The German Neuroscience Society provided scholarships to enable young German scientists to participate. (jn)

Lecture series with Indian academy kicks off



On 5 December, with his lecture "Can we understand an insect society, and why should we care?", Prof. Raghavendra Gadagkar ML, president of the Indian National Science Academy (INSA), kicked off a lecture series in which INSA and Leopoldina members present their work to the general public in order to promote the visibility of Indian and German science. Prof. Gadagkar spoke about his work with wasps before a nearly packed auditorium in Leopoldina's main building. He did not merely share his research findings, but gave insights into his working methods and the logic that drives his experiments, so as to make the scientific process understandable to lay people.

(rn)/photo: Markus Scholz

A tireless advocate of scientific responsibility

The Leopoldina mourns long-time Presidium member Prof. Hans Mohr

BY PROF. BENNO PARTHIER ML*

Prof. Hans Mohr, a long-time Presidium member, a consistent proponent of a pan-German science and a tireless advocate of scientific responsibility, died on 29 December 2016 at the age of 86. He studied biology, physics and philosophy in Tübingen, showing early on a broad spectrum of interests, and completed his PhD there in 1956 under the supervision of Erwin Bünning, for whom he had a lifelong admiration. Mohr also earned his postdoctoral lecture qualification in Tübingen, and in 1960 took over the Professorship of Botany at the University of Freiburg

His special interest was photomorphogenesis, a field in which he accomplished ground-breaking work. He established the mustard seedling as a model organism



Prof. Emeritus Hans Mohr.

photo: Universität Freiburg

and discovered that phytochrome functions via differential gene activation as a mode of action; these findings became common knowledge through his successful textbook *Lehrbuch der Pflanzenphysiologie*.

Yet Hans Mohr did not limit himself to his particular field. He continually concerned himself with the role of science and the framework in which science should be conducted. It is hardly surprising that he was a very active and dedicated board member at the Academy for Technology Assessment in Stuttgart, and that he had an impact in the public arena through his speaking and writing. He wrote, for example, to a federal minister that "the amendment to the Genetic Engineering Act is an example of how arbitrary policymaking [based on ideological prejudices] takes away an important option". He advocated throughout his life for the need of a critical science, which for him meant practicing science "on the basis of reliable knowledge and through rational discourse".

Hans Mohr was inducted into the Leopoldina in 1966 at the age of 36 and remained an active member the rest of his life. He received, of course, also numerous honours and distinctions for both his sci-

entific work and his social engagement. These, to name but a few, included membership in the Heidelberg Academy in 1982, the German Federal Cross of Merit (First Class) in 1998 and honorary membership in the German Botanical Society in 2000. In the laudatory speech for the Cothenius Medal, which he received in 2000 for his lifetime achievements in science, it was said: "Before the Wall fell your lectures were taken as inspiration and encouragement by many enthusiastic young people in the GDR. During your tenure as representative of the Botany Section you served as Senator for eight years. In 1993 you joined the Presidium of the Academy, and as a Presidium member you have been generous with your opinions. Many new concepts [...] are based on your ideas [...]. You are the intellectual father of the 1997 Annual Assembly [...] as well as the conceptual initiator [...] of a number of other events."

Hans Mohr's work has left a lasting mark. We at the Leopoldina will truly miss a member who served the cause of science and the Academy in such exemplary fashion. We will always cherish his memory.

* Benno Parthier was president of the German Academy of Sciences Leopoldina from 1990 to 2003.

Personalia

New Members Class IV

■ **Moritz Epple ML**, Frankfurt am Main, Goethe Universität Frankfurt am Main, Department of History of Science (History of Science and Medicine Section)

■ **Stephan Hartmann ML**, Munich, Ludwig-Maximilians-Universität Munich, Chair of Theory of Science (Epistemology Section)

■ **Hannes Leitgeb ML**, Munich, Ludwig-Maximilians-Universität Munich, Chair of Logic and Philosophy of Language (Epistemology Section)

■ **Robert Pippin ML**, Chicago, USA, University of Chicago, Committee on Social Thought (Cultural Sciences Section)

■ **Wolfgang Schön ML**, Munich, Max Planck Institute for Tax Law and Public Finance (Cultural Sciences Section)

■ **Andrea Weber ML**, Vienna, Austria, Vienna University of Economics and Business, Department of Economics, Institute for Labor Economics (Economics and Empirical Social Sciences Section)

Deceased Members

■ **Walter Beier ML**
9 May 1925 – 20 Dec. 2016 | Leipzig
Biochemistry and Biophysics

Walter Beier was well known for his wide-ranging work in medical physics. In addition to investigating ultrasound effects, space medicine and computer diagnostics, he also conducted extensive studies on gerontology, laying the foundation for research into the aging process. In the field of theoretical gerontology he developed important vitality concepts and multidimensional vector analytical methods for determining the biological age of humans.

■ **Rainer Jaenicke ML**
30 Oct. 1930 – 26 Jul. 2016 | Schwalbach am Taunus
Biochemistry and Biophysics

Rainer Jaenicke was active in the field of physical chemistry. He conducted research on the molecular adaptability of

proteins under extreme conditions, including studies on barophiles, halophiles and thermophiles. His principal focus was the physical characteristics of proteins. Jaenicke also wrote methodological articles on experimental studies of the folding and associations of proteins.

■ **Michel Portmann ML**
31 May 1924 – 17 Sept. 2016 | Bordeaux, France
Ophthalmology, Otorhinolaryngology, Stomatology

Michael Portmann worked in the fields of audiology and phoniatrics, specialising in modern otologic surgery. His research improved the speech perception of many patients with impaired hearing. His courses on otologic microsurgery earned the French researcher international acclaim.

■ **Pál Stefanovits ML**
24 Nov. 1920 – 4 Aug. 2016 | Budapest, Hungary
Agricultural and Nutritional Sciences

During his career the agronomist Pál Stefanovits advanced the soil mapping of Hungary, taking into particular consideration soil geographical factors. Besides mapping erosion, he also conducted soil genetic studies. His palaeopedological and soil dynamical discoveries contributed to the modernisation and reorganisation of geography and agricultural education in Hungary.

■ **Sakari Timonen ML**
17 Mar. 1915 – 14 Dec. 2016 | Helsinki, Finland
Gynaecology and Paediatrics

The Finnish physician Sakari Timonen conducted research in the field of gynaecological endocrinology. His specialisations included premalignant changes and mitoses in normal endometrium and in cancer cells as well as the radiation sensitivity of cells. Timonen advocated strongly in Finland for the introduction of early detection tests for cervical cancer.

■ **Günther Wilke ML**
23 Feb. 1925 – 9 Dec. 2016 | Mülheim an der Ruhr
Chemistry

Günther Wilke, one of the founders of organometallic complex chemistry, investigated the oligomerisation and polymerisation of butadiene. He carried out research on transition metal complexes, discovering their structure and then using the complexes for such chemical processes. His work was at the interface between basic research and applied/industrial research.

■ **Ulrich Wolf ML**
2 Jan. 1933 – 4 Jan. 2017 | Freiburg im Breisgau
Human Genetics and Molecular Medicine

Ulrich Wolf is considered the founder of theoretical and clinical cytogenetics in the German-speaking world. He investigated the chromosomal mechanisms of evolution, in particular sex chromosomes. Wolf was one of the discoverers of Wolf-Hirschhorn syndrome, a rare hereditary disease.

■ **Eberhard Zeidler ML**
6 Oct. 1940 – 18 Nov. 2016 | Leipzig
Mathematics

The mathematician Eberhard Zeidler conducted research in the field of nonlinear functional analysis, in particular the investigation of circular channels and channels of finite and infinite depth. His life's work consisted of preparing a comprehensive presentation of modern nonlinear functional analysis. In pursuing this goal Zeidler never lost sight of the applicability of such an analysis to mathematical physics.



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Abbreviations:

ML = Mitglied der Leopoldina