



Leopoldina
Nationale Akademie
der Wissenschaften

Leopoldina news

1/2016

Deutsche Akademie der Naturforscher Leopoldina –
German National Academy of Sciences

Halle, 4 February 2016



Overview of the coming year at the Leopoldina

2016: Intercultural dialogue in the spotlight at the Annual Assembly;
second research summit; advice on handling security-relevant research

COMMUNICATION

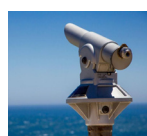
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What is modern infection research achieving?
Fourth seminar programme for journalists is underway

CONFERENCE

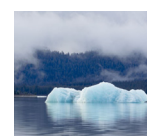
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Prediction: From antiquity to the present day
Class IV symposium on policy advice

INTERNATIONAL ISSUES

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Negotiations for better climate protection
Outcome of the COP21 conference in Paris

Editorial

Dear members and friends
of the Leopoldina,



Heads of state and government sent a strong message at the Climate Change Conference in December: the Paris Agree-

ment sees all nations vowing to keep the global temperature increase well below two degrees Celsius over pre-industrial levels. The aim is to achieve a balance between the emission and absorption of greenhouse gases in the second half of the 21st century. The agreement will be signed on 22 April, making 2016 an historic year for climate policy.

The fact that we now know how important climate protection and sustainable development are for future generations is down to intensive research. And research will also be important in finding ways to limit global warming and achieve sustainability. The Scientific Advisory Board of UN Secretary-General Ban Ki-moon, to which I was appointed *ad personam* two years ago, met shortly after the Paris Climate Change Conference (see p. 6) and proposed eight important challenges that need to be overcome to achieve these goals: sustainable management of the oceans, effective systems for protecting biodiversity, protection against infectious agents, the reliable forecasting of extreme weather, moving away from fossil fuels, the provision of clean drinking water, strategies for dealing with population growth, greater equality in the use of resources, and a minimum level of public-sector funding for basic research. Overcoming these challenges requires a willingness on the part of policymakers as well as further knowledge and new technologies. The Paris Agreement could provide the necessary impetus for numerous innovative ideas.

I wish you a thought-provoking read.

Ulf G. Kluge

Topics of discussion for 2016

An overview of the Leopoldina's events calendar

The beginning of the year offers a good opportunity to look ahead to the coming months and present some of the events we have lined up for 2016.

The traditional highlight on the Leopoldina's calendar of events is the Annual Assembly, which will be taking place this year on 23 and 24 September in Halle with a focus on "The Sciences in Intercultural Dialogue". Tübingen-based philosopher Otfried Höffe ML is organising this year's programme.

The Stifterverband für die Deutsche Wissenschaft and the Commission of Experts for Research and Innovation (EFI) are joining the Leopoldina in hosting the 2016 research summit on 12 April in Berlin. This meeting will bring together experts from the fields of politics, science and industry at the Allianz Forum on Berlin's Pariser Platz to discuss the subject of digitisation.

On 11 and 12 April, the Leopoldina Study Centre in Halle will hold a first Young Researchers Forum on the history of science. The event will give junior scientists the opportunity to present their research projects relating to the history of science and knowledge.

The Leopoldina will continue to address the topic of security-relevant research in 2016. The German Research Foundation's (DFG) and the Leopoldina's Joint Committee on the handling of security-relevant research is organising an information event on 14 April in Berlin, which will include the presentation of a model statute for the establishment of Commissions for Ethics in Research (KEFs) at German research institutions. The DFG and the Leopoldina first recommended setting up these commissions in a joint paper published in summer 2014 as a way of helping universities and research institutions take a responsible approach to dealing with risks in science.

On 27 May, Nobel laureate Eric Kandel ML will hold a Leopoldina Lecture at Humboldt-Universität zu Berlin on his neuroscientific research.

The Leopoldina is also organising more meetings and symposia with international partners for the coming year. A Joint Science Conference on the Western Balkans region is to take place once again



The Annual Assembly (photograph from 2015) is a highlight on the Academy's calendar of events.

Photo: Christof Rieken

on 23 and 24 May in Vienna; the annual meeting with South Korea's National Academy of Sciences is scheduled for 6 and 7 October in Berlin; and scientists from the Academy of Science of South Africa and the Leopoldina will also meet in Berlin in late October for a symposium on the topic of infectious diseases. Another symposium is planned to take place from 28 to 30 November in Israel in partnership with the Israel Academy of Sciences and Humanities on the topics of brain research and artificial intelligence.

This year will also see the continuation of the Leopoldina Lectures in Herrenhausen, organised in cooperation with the Volkswagen Foundation. The first lecture of 2016 takes place on 10 February at the Schloss Herrenhausen conference centre in Hannover with the title: "Connected citizens – How is the digital revolution changing our democracy?"

The Leopoldina is a longstanding participant in Halle's city-wide Long Night of Sciences, which this year takes place on 1 July. The Academy offers visitors a varied programme that includes a science-based puppet show, a Science Slam, debates, and a presentation of the Leopoldina's work.

(jk)



The fourth “Diving into Science” seminar programme has begun, plunging 15 journalists from ARD, ZDF and other esteemed German media into the world of infection research and medicine. The programme kicked off at the Leopoldina in Halle and the Robert Koch Institute in Wernigerode. Photos: Markus Scholz

Fourth seminar programme for journalists

Measles, Ebola, flu – Leopoldina provides further training in infection research and biomedicine

Editorial teams from influential German media are participating in the latest seminar programme for journalists. They represent ARD Berlin studios, the Mitteldeutsche Zeitung newspaper, ZDF’s daily news show heute journal, the Nürnberger Nachrichten newspaper, the KNA Catholic news agency, and Bayerischer Rundfunk’s radio show B5 aktuell. Fifteen journalists attended the first seminar in November, which covered “Infectious diseases – What biomedicine is researching and what it is achieving”. The event marked

the start of the fourth seminar programme run by the Leopoldina in collaboration with the Robert Bosch Foundation. It was launched in Halle and at the Wernigerode branch of the Robert Koch Institute (RKI).

Programme participants learned about basic biological processes and the epidemiology of infectious diseases, and discussed how infectious diseases are handled at the political level. On hand to share their knowledge and answer questions were Leopoldina President Prof. Jörg Hacker ML, Vice-President of the RKI Dr

Lars Schaade, Prof. Martin Mielke of the RKI, and Prof. Christiane Ritter of the Helmholtz Centre for Infection Research.

The second seminar in April takes the journalists to Berlin, where the programme includes visits to the RKI, to the Max Planck Institute for Infection Biology and the Charité hospital. Planning for the third seminar in October at Institut Pasteur in Paris is currently underway, and the final seminar is likely to take place in 2017 at Friedrich-Loeffler-Institut with Prof. Thomas Mettenleiter ML. (dw)

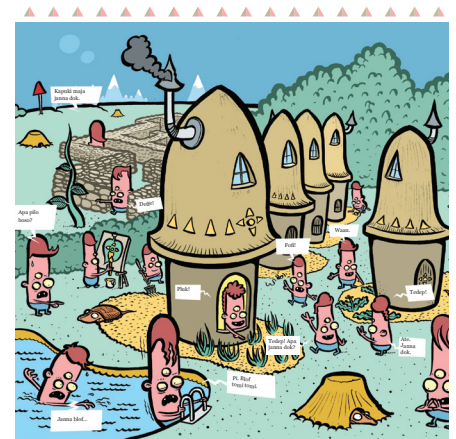
Science games at the Young Academy

“Peer Review” and “Expedition Mundus”

Peer review – feedback from one’s colleagues – is the keystone of science. The Young Academy has now developed an educational and enjoyable peer review game. Four to six players take it in turns to present “research papers” and give feedback based on the other players’ “desiderata” while collecting and awarding “merits”. And the game has not only proved popular in Germany: members of the Swedish Young Academy played it with a simultaneous interpreter and have expressed their wish for an English-language version of the game. This is not only a success for the game’s inventor, philo-

sopher Dr Cornelis Menke, but also for Stiftung Bildung und Gesellschaft (Foundation for Education and Society), which worked together with the Young Academy on the project.

While „Peer Review „seeks to strengthen young scientists’ self-reflection and academic competencies, „Expedition Mundus“ is intended to awaken curiosity about the scientific world in children aged eight and over. In the game, players independently explore the planet Mundus. The game was developed by the Dutch Young Academy and translated into German by the Young Academy in Germany.



It’s time to meet the Mundians and get exploring planet Mundus!. Picture: Young Academy

It is available to download on the Young Academy’s website. (aw)

Prediction: From antiquity to the present day, from haruspicy to economic forecasting

Leopoldina Class IV lecture and symposium address the topic of policy advice

The 2015 Class IV symposium on 26 November 2015 explored the topic of “prediction”. The event was co-chaired by Prof. Frank Rösler ML, secretary of Class IV, and Prof. Gereon Wolters ML, the Class IV spokesman.

Prof. Stefan M. Maul ML of Heidelberg University gave the Leopoldina Lecture the preceding evening on “Policy advice in the ancient Orient, or the rights and wrongs of prediction”. Maul painted a vivid portrait of how rulers and generals in Mesopotamia and the ancient Near East relied on consultation with astrologers and practitioners of haruspicy (divination by reading the entrails of sacrificed animals). These teachings, which seem so wholly unscientific from a 21st-century perspective, did, however, employ a methodology, so that this policy advice based on signs (e.g. particular surface markings on a sheep’s liver) actually contributed to lasting stable political conditions.

The role of psychology in predicting highly complex systems

The symposium the following day opened with a lecture by Prof. Maria Carla Galavotti ML of the University of Bologna, entitled “Prediction in Context”. Classically, prediction was closely linked to the concept of causality; however, this deterministic model was replaced by the notion of probability in the late 19th and early 20th centuries, as knowledge of thermodynamics and quantum theory developed. Nowadays we favour complex prediction models that attempt to take all possible factors into account, explained Prof. Galavotti.

In his paper “Prediction in very complex systems”, Prof. Dietrich Dörner ML of the University of Bamberg spoke about the role of psychology in evaluating future situations. In his paper, Prof. Alfons Labisch ML (Heinrich Heine University Düsseldorf) considered medical prognosis in various medical concepts and disciplines, giving a systematic historical overview from antiquity (Hippocrates) to the present day (molecular biology). Thanks to genome analysis in particular, he said, prognostic tools have advanced so far that

New Members of Class IV



The new members of Class IV are presented with their membership certificates: From left to right: Leopoldina Secretary-General Prof. Jutta Schnitzer-Ungefug (Halle), Prof. Paul Julian Weindling ML (Oxford), Prof. Ludger Wößmann ML (Munich), Prof. Artemis Alexiadou ML (Berlin), Prof. Wolfgang Stroebe ML (Utrecht), Prof. Dagmar Schäfer ML (Berlin), Leopoldina President Prof. Jörg Hacker ML (Halle), Prof. Maria Carla Galavotti ML (Bologna), Prof. Peter Strohschneider ML (Bonn).
(jk)/Photo: Markus Scholz

other forms of patient advice may well develop in the future – possibly a kind of lifestyle management, for example.

Call for improved economic forecasting

The symposium concluded with a lecture by Prof. Lars P. Feld ML (University of Freiburg) on “Economists’ forecasts and projections: Could we have seen the crisis coming?”. Looking at the financi-

al crisis of 2008/2009, Feld asked why forecast models fail to predict serious financial and economic crises. He explained the complex calculation of GDP – the economic power of a country at a given moment – to predict its future economic power. The fact that experts predicted a false GDP growth rate shows that a more sophisticated prediction model is needed, said Feld.
(cb/amg)

CLASS SYMPOSIA DATES FOR 2016

The Leopoldina’s four Classes each meet once a year for a symposium in Halle, which also serves as an occasion to officially welcome new members. This year’s symposia dates are as follows: Class I – Mathematics and the Natural and Engineering Sciences on 24 March; Class II – Life Sciences on 26 May; Class III – Medicine on 14 July; and Class IV – The humanities and social and behavioural sciences on 17 November.
(jk)

Focusing on climate and sustainability goals

Climate Change Conference in Paris: UN Scientific Advisory Board identifies challenges in the fight against global warming / Leopoldina President a member of the Board since 2014

From 14 to 15 December 2015, the UN Secretary-General's Scientific Advisory Board (UNSAB) met in St. Petersburg for its fourth session. The focus of the debate was the role of science in the implementation of the global sustainability agenda and the climate agreement reached at the Paris talks. The interdisciplinary board is made up of 26 scientists, including Leopoldina President Prof. Jörg Hacker ML, who was appointed ad personam in 2014.

The Advisory Board presented what it considers to be the eight key global challenges of the future: sustainable management of the oceans, effective systems for protecting biodiversity, protection against infectious agents (a recommendation from the Leopoldina President), the reliable forecasting of extreme weather, moving away from fossil fuels, the provision of clean drinking water, strategies for dealing with population growth, greater equality in the use of resources, and a minimum level of public-sector funding for basic research.

Leopoldina President Hacker also submitted a working paper on the role of



The UN Secretary-General's Scientific Advisory Board (UNSAB) met in December in St. Petersburg for its fourth session.

Photo: Secretariat UNSAB

science in the implementation of the global sustainability agenda agreed by the United Nations in September 2015. The paper emphasises that science is a powerful engine for driving sustainable development and not just an instrument for the implementation and further development of existing solutions. Hacker was asked to lead a working group that will formulate recommendations to scientists and policy-

makers on how the role of science can be strengthened in the context of the 2030 agenda.

As a member of the Board, President Hacker had already participated in a UNESCO event on 10 December 2015 in the run-up to the UNSAB session, held during the UN Climate Change Conference (COP21).

In his address, the Leopoldina President spoke about the challenges related to climate change that will face scientists in the future. He presented a statement to an audience of experts and policymakers that had been prepared by the Academy prior to the conference, "The Co-Benefits of Actions on Climate Change and Public Health" (November 2015). (rn/chw)

General Assembly of the EU's National Science Academies

The six-monthly General Assembly of the network of the National Science Academies of EU Member States (EASAC) took place on 19-20 November 2015 at the conference centre of the Slovak Academy of Sciences, Smolenice Castle. At the meeting, the Executive Committee and the Executive Director gave a report of the EASAC activities that had taken place over previous months. In particular, the very positive reception by the European Commission of an EASAC report on „Gain of Function“ (in virology) by the European Commission received some attention.

This report had been compiled by EASAC with special support by the Leopoldina. The assembled representatives of EASAC's member academies took a number of important decisions on EASAC's activities in 2016. On initiative of the Swedish Academy, it was decided to prepare a statement on „Homeopathy“. Furthermore,

re, EASAC will start work on a report on „Genome Editing“. In the area of Environment, EASAC will conduct two follow up studies on its statement about a „Circular Economy“, to wit, on the indicators for such an economy and on the elements of a waste-based economy. In the area of Energy, it was decided to continue scoping for a study on sustainable transport – of people and goods in Europe.

Apart from these issues, the assembly at Smolenice also reflected on a number of strategic topics, such as the role of EASAC's Steering Panels and the opportu-



The National Science Academies of EU Member States (EASAC) met at the conference centre of the Slovak Academy of Sciences.

Photo: SAV

nity for its member academies to take on a lead role for specific studies. Finally, there was a discussion about a joint project application by EASAC, three further European networks of academies and the pan-European Academia Europaea. (csd)

People

New members Class IV

■ **Alexia Fürnkranz-Prskawetz ML**, Vienna, TU Wien, Institute of Stochastics and Mathematical Methods in Economics, (Economics and Empirical Social Sciences Section)

■ **Karl Gegenfurtner ML**, Giessen, Justus Liebig University Gießen, Experimental Psychology (Psychology and Cognitive Sciences Section)

■ **Ulrike Hahn ML**, London, UK, University of London, Computation and Modelling, Birkbeck, Department of Psychological Sciences & Centre for Cognition (Psychology and Cognitive Sciences Section)

■ **Thomas Mussweiler ML**, Cologne, University of Cologne, Department of Psychology (Psychology and Cognitive Sciences Section)

■ **Carsten Reinhardt ML**, Philadelphia, Chemical Heritage Foundation (History of Science and Medicine Section)

■ **Christian Welzel ML**, Lüneburg, Leuphana University of Lüneburg, Center for the Study of Democracy (Economics and Empirical Social Sciences Section)

Deceased Members

■ **Wilhelm Hasselbach ML**
115 October 1921 – 7 November 2015
| Heidelberg
Physiology and Pharmacology / Toxicology

Physiologist Wilhelm Hasselbach conducted experimental work in the field of muscle structure, investigating contractile proteins and carrying out studies with electron microscopes. His most important achievements include localising myosin in the A-bands of striated muscles and discovering calcium pumps in the membranes of sarcoplasmic reticulum.

■ **Stefan Hildebrandt ML**
13 July 1936 – 16 October 2015 | **Cologne**
Mathematics

Stefan Hildebrandt dedicated his scientific career to the study of the calculus of variations, conformal mapping and minimal surfaces. He was awarded honorary doctorates from the universities of Bochum, Leipzig and Düsseldorf. In 1994, Hildebrandt received the Karl-Georg Christian von Staudt Prize for his works on the calculus of variations.

■ **Lothar Jaenicke ML**
14 September 1923 – 29 December 2015 | **Cologne**
Biochemistry and Biophysics

Lothar Jaenicke was a pioneer in the field of enzyme-oriented natural products chemistry. Jaenicke made a valuable contribution to the fundamental understanding of metabolic incorporation from the C1 pool. He also co-discovered the function of pteroyl polyglutamate, also known as folic acid. In 1963, Jaenicke was awarded the Paul Ehrlich and Ludwig Darmstädter Prize – one of Germany's most prestigious awards in medicine.

■ **Dorothea Kuhn ML**
11 March 1923 – 13 December 2015
| Weimar
History of Science and Medicine

Dorothea Kuhn was a chemist and botanist. She was also a renowned specialist in the work of natural scientist Johann Wolfgang von Goethe and made important contributions to the Leopoldina publication Goethe. Die Schriften zur Naturwissenschaft (Goethe – Works on the Natural Sciences). Kuhn acted as spokeswoman for the History of Science and Medicine Section in the Senate from 1992 to 1998. In 1999 she was awarded the Leopoldina's Cothenius Medal.

■ **Klaus Günther Müntz ML**
30 July 1932 – 18 November 2015 | **Gatersleben**
Genetics / Molecular Biology and Cell Biology

Klaus Günther Müntz worked in the field of genetics. His research combined plant physiology and agricultural botany. Through his research into crop plants, Müntz was able to investigate and decipher the biosynthesis of storage proteins. Müntz is recognised as a pioneer in molecular biological research into reserve protein deposits in the cotyledons of seed-bearing plants.

■ **Rudolf Manfred Schmidt ML**
6 November 1926 – 21 December 2015 | **Halle (Saale)**
Neurosciences

Working in cerebrospinal fluid diagnosis, Rudolf Manfred Schmidt helped advance the fields of neurology and psychiatry. He made a significant contribution to scientific developments in the diagnosis of cerebrospinal fluid in the GDR, introducing, for example, protein electrophoresis into the country. Schmidt also made outstanding contributions towards the early detection of multiple sclerosis.

■ **Alfred Seeger ML**
31 August 1927 – 18 October 2015 | **Stuttgart**
Physics

Alfred Seeger was a solid state theoretical physicist. He explored the microscopic understanding of lattice defects in order to gain better insight into the electron structure of metals. Seeger's research into the basic principles of nuclear solid state research paved the way for many subsequent findings. From 1956 until his retirement in 1995, Seeger was Director of the Physics Institute at the Max Planck Institute for Metals Research.



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Abbreviations:

ML = Member of the Leopoldina