



Leopoldina  
Nationale Akademie  
der Wissenschaften

# Leopoldina news

2/2014

Deutsche Akademie der Naturforscher Leopoldina –  
German National Academy of Sciences

Halle (Saale), 2 April 2014

## What does tomorrow's research need?

Interview with DFG President  
Peter Strohschneider on funding  
and functions in the scientific system

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First Japanese member  
of the Leopoldina  
Hayashi Tsuruichi broke  
new ground in mathematics

# Editorial

Dear members and friends  
of the Leopoldina,



scientists and  
journalists  
don't always  
speak the same  
language. Jour-  
nalists can so-  
metimes find  
science difficult

to understand. Conversely, scientists often find it difficult to explain their complex research in simple words and 90-second sound bites. To improve understanding between the two sides, the Leopoldina and the Robert Bosch Foundation set up the "Total immersion into Science" seminar programme for journalists two years ago. I am delighted to announce that the programme has now been extended to 2018.

At the seminars, journalists who do not usually report on scientific topics learn about the world of research, meet outstanding scientific experts, and discuss scientific topics of major social relevance. At the same time, the seminars give journalists and scientists a chance to discuss their expectations, roles and working conditions. You can gain an impression of the seminars on page 4.

This collaboration allows the Leopoldina to inform the public about current scientific findings. The transfer of this kind of information to the public is becoming ever more important, and journalists are key mediators in this communication process. The world is shaped by science, and it is playing an ever greater role in news reporting. Topics such as the switch to renewable energy sources, personalised medicine, and demographic change feature on the front pages of the major daily newspapers and are often headline news. A level of scientific expertise is required to produce well-founded reports, for which the "Total immersion into Science" seminars offer valuable background information.

*G. J. F. Scholz*

## Trying to economise on science can lead to downward spirals

Interview with DFG President Peter Strohschneider



Peter Strohschneider spoke about the future of the research system in Halle.

Photo: Markus Scholz

*Prof. Peter Strohschneider, President of the German Research Foundation (DFG), spoke about the "state and future of the research system" during his Leopoldina Lecture on 25 February. In an interview with Leopoldina news, he discusses the ban on federal and state governments cooperating on financing universities, competition for the brightest minds and third-party funding, and cutbacks.*

*When Germany's federal structure was reformed in 2006, one of the key points was that the federal and state governments would no longer be allowed to co-finance universities. In the meantime, many people hope that the ban will be lifted. What do you think the chances are of this happening?*

**Strohschneider:** The grand coalition hasn't provided detailed information yet on the legal and financial issues. However, it has announced a change. The grand coalition agreement says that the federal government will provide some of the basic funding for universities in the future. This is the crucial point. It is not just a matter of how much funding is allocated to universities and research institutes – the structure of how they are funded is also important. And the ratio between basic funding and third-party funding plays a particularly important role.

*As President of the DFG, you could actually be pleased about the increased importance of third-party funding. Why do you see this development in such a critical light?*

**Strohschneider:** One reason is that the function of third-party funding has changed. It has been a type of secondary currency in the scientific system for a long time now. One aspect is that third-party funding is used as a basis for deciding all sorts of matters besides research funding, namely academic decision-making powers, universities' structural programmes, the salaries earned by the people who submit the proposals, and so on. The other aspect is the intense competition for third-party funding. This has reached the extent that even the DFG has to say that undesirable side effects are increasing significantly. We can see that anything financed as a project works comparatively better in the universities. But at the same time, all the scientific functions that cannot be funded as projects are suffering from a lack of funding. These functions include teaching – both in terms of quantity and quality – but also university construction work and infrastructure.

*Do the cutbacks being urged by several German states in light of the difficult budget situation affect the quality of the next generation of young researchers?*



**Strohschneider:** I can't really answer that question – at least I can't say to what extent the financial situation of public sector budgets and the universities is affecting the promotion of young researchers more than other areas of research. I can't really be the judge of that. However, there is no doubt that scientific systems can go into downward spirals as a result of cut-backs. We know that these systems need to be appealing to the people we want to

recruit, as well as to those whom we wish to retain, persuading them from leaving a university here at home. And I have to say that competition for staff has definitely become tougher in the scientific system. The universities and colleges see that in hiring procedures. The Max Planck Institutes and other non-university research institutions also notice it.

*Do you see any positive examples?*

**Strohschneider:** I would see something like the Research Centre on Integrative Biodiversity Research in Leipzig, Halle and Jena, a joint research group set up by the DFG last year, as one example. Of course, it's not the only example. However, it shows how you can create a type of upward spiral for certain academic fields, a spiral that extends beyond the universities to non-university research and then back again.

## The missing component of the switch to renewables?

Experts discuss energy storage technologies and the challenges they present to society

How much storage does the switch to renewables need? This was the question posed by Prof. Eberhard Umbach, Karlsruhe, when he opened the Leopoldina symposium, "Energiespeicher – der fehlende Baustein der Energiewende?" (Energy storage - the missing component of the switch to renewables?), on 6 February. Umbach predicted a paradigm shift, saying that electricity has been regulated by demand in Germany to date, whereas it will be determined by supply in the future. He pointed out that only fossil fuel power plants had to be funded in the past, but that financing was now also needed for renewable energies, new power plants and, in the future, energy storage facilities.

### Energy system like „a pension system for the economy“

Prof. Robert Schlögl ML, who organised the symposium, outlined the dimensions of the switch to renewables in his welcome address. He compared the energy system with the "intergenerational contract", calling it a kind of "pension system for the economy".

Prof. Ortwin Renn, Stuttgart, pointed out that there was widespread support among the public for the switch to renewables. However, most people were not happy with how the switch is being put into practice. He said that the transformation to renewable energy will fail if findings on demand behaviour and the willingness to accept the switch to renewables are not quickly translated into political strategy.

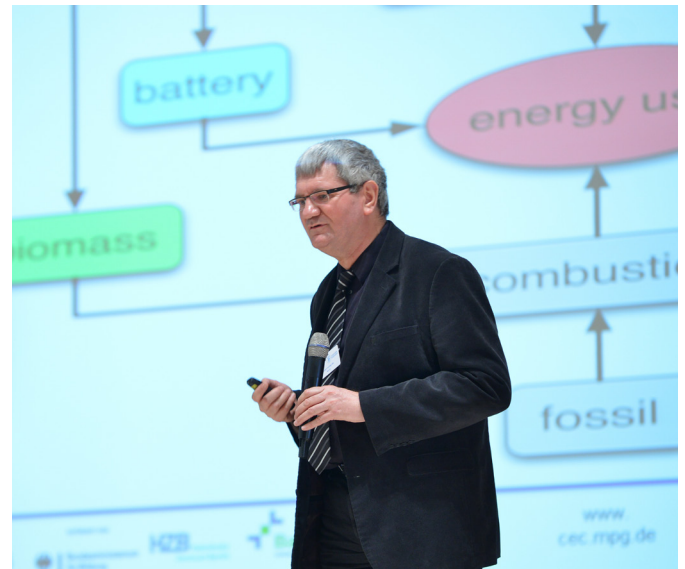
Dr Britta Buchholz, Mannheim, examined how energy storage and energy grids will have to work together in the fu-

ture. She explained that the distribution grid had become a "collection grid" for renewable energies and pointed out that grids will have to cope with fluctuations in the electricity supply generated by wind energy and photovoltaics. To this end, Buchholz said, the locations of energy storage facilities will have to be selected very carefully.

In his analysis, Friedrich Schulte, Essen, focused on profitability. He explained that pump storage facilities were currently the only profitable large storage type, but that they had no future in Germany. Peter Moser, Essen, also had no positive news to report. He told the audience that the start of construction on a compressed air energy storage pilot plant had been postponed from 2013 to 2017 because of economic uncertainty.

Dr Christian Dötsch, Mannheim, gave an overview of the current state of battery research, explaining that it had caught up in Germany in recent years. He said that the focus was on reducing production costs in the various battery systems.

Prof. Ferdi Schüth ML, Mülheim, spoke on the topic of material research for future storage facilities. This research could



*The scientific coordination of the symposium was in the hands of Robert*

*Schlögl.*

Photo: Markus Scholz

lead to lower weight and higher energy densities for mobile battery storage systems. Hydrogen from surplus wind energy should definitely not be reconverted into electricity, he said, but used as a chemical product instead. This is happening in a joint research project, which Prof. Kai Sundmacher, Magdeburg, presented in his talk on "power to gas". He said that long-term chemical energy storage facilities would be essential in the energy system in order to safeguard supply security.

In his presentation, Prof. Rudolf Thauer ML analysed why biological energy storage such as bioethanol or biodiesel are inefficient. However, he said, microbiological research has achieved significant results with the cultivation of bacteria that produce methane. (ca)

## A rewarding encounter for both sides

Second “Total immersion into Science” programme on climate change and renewable energies

*The aim of “Total immersion into Science”, a seminar programme for journalists set up by the Leopoldina and the Robert Bosch Foundation, is to give journalists first-hand access to the scientific backgrounds to themes of the day. Christian Schafmeister of the newspaper Mitteldeutsche Zeitung, a participant in the second cycle of the programme, shares his impressions with Leopoldina news.*

Many journalists feel that talking to scientists can be taxing. Above all, it is difficult to be friendly but firm in coaxing scientists to explain complicated topics in simple language, not for their scientific peers, but for people reading the newspaper at the breakfast table or listening to the radio in their car – with fewer specialist terms and instead using analogies and images that members of the public can relate to.

Conversely, many scientists say that talking to journalists can be taxing. From their point of view, journalists often lack background knowledge. A common complaint is that they only partially address the topics in their quest for flashy headlines, as well as adopting contrived analogies that don't really work. Plus, there are those times when a scientist has only just responded to all a newspaper editor's questions in a lengthy conversation and then a radio reporter asks to hear it all again in 90 seconds.

It doesn't have to be this way – there can be a rapprochement between science and journalism. And this is exactly what



*During the four “Total immersion into Science” seminars, participants receive first-hand background information on the topics of climate change and renewable energy.*

Photo: V. Diekamp/MARUM

the 15 journalists taking part in the second edition of “Total immersion into Science” experienced in November. The series of four seminars, which runs until mid-2015, is entitled “Responses to climate change: Research for a sustainable energy supply”. Frankly, the title on its own says everything and nothing. But during the seminar it became gratifyingly concrete.

In the ice laboratory at the Alfred Wegener Institute in Bremerhaven, for instance, we learnt that the ice cores stored there can give us information about carbon dioxide levels in the atmosphere 800,000 years ago. Such deductions are made possible by little air bubbles that were once trapped in the ice under the pressure of the ice cap. And here's the fun part: The gas concentrations in the bubbles correspond exactly to the concentrations of gases in the atmosphere at the point in time when the bubbles formed. This makes the ice cores something of a climate archive of Earth's history.

There's another such archive in the

Center for Marine Environmental Sciences at the University of Bremen. Except here it consists not of ice cores, but of cores drilled from the depths of the ocean floor. These also give fascinating insights into the planet's past.

Two examples, one topic – the archives of Earth's history. And so the central idea for a news story is born. But the lectures based around this theme are not enough on their own; we have follow-up questions. Fortunately, there are researchers who are not only willing to answer these, but who – unprompted – even conjure up the analogies and images that the journalists need to form a comprehensible story. And some even help develop the story, with modest comments such as: “You can forget my whole lecture, but you should remember this graphic!” That's the sort of thing that makes an impression on journalists. And, in return, the scientists too are often positively surprised with the articles that appear at the end. “You put that story together really nicely,” they say, with a mixture of relief (it's all correct!) and admiration (we would never have thought to present the topic like that!).

And so this process of continually getting to know each other and fostering dialogue proves to be rewarding for both sides. In early April we will get the chance to immerse ourselves in science once again, this time in Potsdam – we can't wait!



*A visit at the ice laboratory at Alfred Wegener Institute in Bremerhaven was part of the first seminar in the new series.*

Photo: Tim Dierks



## A boost for mathematics in Japan

Hayashi Tsuruichi, the first Japanese member of the Leopoldina, founded an important journal

Harald Kümmerle worked as a visiting researcher at the Leopoldina study centre for scientific and academy history from December 2013 to the end of March 2014. Kümmerle is now embarking on a PhD at Martin-Luther-Universität Halle Wittenberg under the supervision of Prof. Christian Oberländer, in which he combines research approaches from history of science and Japanology.

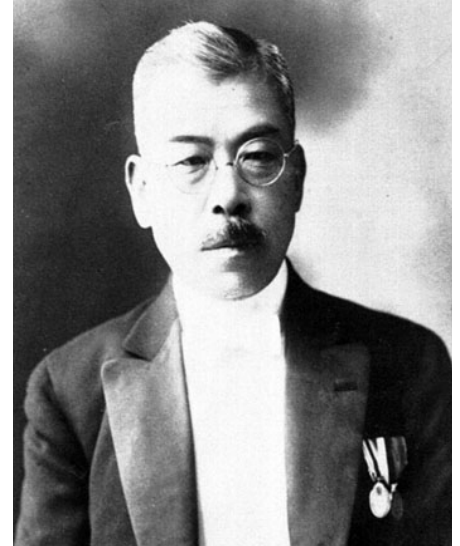
His research at the Leopoldina focused on the academy's first Japanese member, the mathematician Tsuruichi Hayashi (1873-1935), who was appointed in 1924. In 1911, Hayashi began publishing the Tohoku Mathematical Journal – initially at his own expense. This journal not only revolutionised the publication of mathematics in Japan, it also gained international stature as it included articles written by notable mathematicians from all over the world. The Leopoldina library has subscribed to the journal since 1916. Hayashi was also one of the founding professors and head of the Mathematical Institute at Tohoku Imperial University in Sendai, which was



the most advanced department of mathematics in Japan. Kümmerle's PhD proposal ties in with the Leopoldina's tradition of research on the history of mathematics. The aim of the project is to investigate the transmission of Western mathematics to Japan and the institutionalisation of Japanese mathematics.

By the end of the 1920s, Japanese mathematics had undergone a huge transformation. Until around 1870 – alongside traditional Japanese mathematics, which was predominantly cultivated as an artistic, recreational activity – Western mathematics had been practised as a tool for industrial and military purposes. Now, a modern scientific system was emerging in the field of mathematics that allowed world-class research to be conducted.

Kümmerle's PhD project will analyse not only the people, organisations and research institutions that existed at that time, but also the social conditions and the dictates of the international scientific



Hayashi Tsuruichi was appointed to the Leopoldina in 1924.

Photo: Leopoldina

community. The aim of his work is to clarify which forces played a role in the emergence of the scientific system, and how these forces interacted with one another within the institutional framework. The project will also help to re-evaluate the relationship between pure and applied mathematics in Japan throughout its history. Kümmerle will now take up a one-year DAAD scholarship for the continuation of his research in Japan. (rgo/hak)

## Strategies against plant diseases

European Academies Science Advisory Council presents report “Risks to plant health” in Brussels

Plant health is the key theme of the latest report published by the Leopoldina in collaboration with the national science academies of other EU member states. The EASAC paper was presented by Prof. Joachim Schiemann (Julius Kühn-Institut, Quedlinburg) in Brussels on 10 March 2014.

Prof. Anne Glover, Chief Scientific Advisor to the President of the European Commission José Manuel Barroso, moderated the panel discussion that followed the presentation. Representatives from the Commission, European agricultural associations and research centres for-

med the panel. The report “Risks to plant health: EU priorities for tackling emerging plant pests and diseases” highlights the threats to agriculture, forests and the ecosystem in general caused by a lack of precautions to prevent plant diseases. New pests and diseases that could reach Europe as a result of increased global trade are discussed in the report, as well as existing, well-known threats to plant health that could have a new, very harmful effect as a result of mutations. The report comments on the EU's existing legislation, and proposes measures to improve it, aimed at the European Commission and Parliament.

The discussion also addressed topics from the previous EASAC report on genetic engineering, “Planting the Future”.

EASAC's recommendations sparked a wave of discussions in Brussels, and they continue to be discussed fervently today. The potential for the targeted development and use of genetically modified crops to alleviate the threat to European ecosystems caused by pests and diseases was a major point of discussion during the event on 10 March. (csd)

■ FURTHER INFORMATION:  
[www.easac.org](http://www.easac.org)

# Publications

## The Nova Acta Leopoldina series has recently published:

„Sepsis - A Translational Approach“, (eds.) Hugo Van Aken and Dietmar Vestweber, Leopoldina symposium of 25 November 2011 in Münster, Volume 117, No. 395, 2013, ISBN: 978-3-8047-3240-7, € 12



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#### Abbreviations:

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