

Florian Budde

Opening speech for the 120th Bunsen-Tagung in 2021

Dear ladies and gentlemen, friends of physical chemistry, dear members (and soon to be members),

I have the great honor and pleasure to welcome you to the 120th annual meeting of the German Bunsen Society and the first ever to be conducted virtually.

I think we can all agree that meeting electronically can never truly replace the experience and dynamics of in-person interaction, with all the opportunities it provides for informal conversations and exchange of information. But it is great progress when you look back at last year when we had to cancel the Bunsen-Tagung altogether as Corona had just begun to spread around the world.

For being able to master this extra challenge of a virtual meeting and at the same time manage to put together a highly relevant and interesting program for our 550 participants, I would like to thank:

- the chairs of this year's Bunsen-Tagung, Prof. Dr. Bernhard Dick and Prof. Dr. Patrick Nürnberger
- our scientific cooperation partners the Colloid Society and the SFB/Transregio 146 represented by Prof. Dr. Michael Gradzielski and Prof. Dr. Kurt Kremer
- and the program committee of the Bunsen-Tagung 2021.

We are also honored to have these outstanding scientists joining us as plenary speakers, adding the certain something to our event.

PLENARY SPEAKERS



A further welcome goes out to all the recipients of our awards who will be honored immediately after this welcome:

- Ewald-Wicke-Preis: Dr. Kai Steffen Exner
- Nernst-Haber-Bodenstein-Preis: PD Dr. Lars Heinke

Dr. Florian Budde
Chairman DBG
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- Bunge-Preis 2020: Prof. Dr. Simon Werrett
- Bunge-Preis 2021: Prof. Dr. Liba Taub,

This event would not have been possible without the sponsors. I would like to thank for their contributions.

DBG & the chairs convey sincere thanks for supporting the Bunsen-Tagung 2021 to the following companies and organizations:

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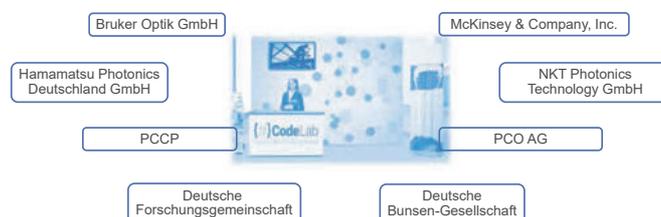
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Please get in contact with the exhibitors during this new virtual format. They provide interesting features at their booths and you can chat with the booth personnel. Also make a note of the session "Industrial Topic", where some of these companies will present themselves.

EXHIBITORS



Lastly, I would also like to extend an especially warm thank you to Dr. Elisabeth Kapatsina and Dominique Mitireva from the DBG head office for their tireless support.

Ladies and gentlemen, these are truly exciting times – and we have often heard that in Chinese proverbs, this can be curse and a blessing at the same time. We are all painfully aware of not only the Corona pandemic, but also climate change and other ecological challenges, such as water shortage, the reduction of biodiversity, or the increasing resistance of harmful bacteria against antibiotics. These developments add to the further economic division of the world and thus, contribute to the already increasing number of political issues that the world is facing.

At the same time, and fortunately so, we are observing enormous scientific and technological progress. Ray Kurzweil, director of engineering at Google, in 2001 described the “law of accelerating returns”, which states that technological progress is indeed increasing exponentially. According to Kurzweil, we will experience not 100 years of progress in the 21st century (linearly extrapolating the speed of progress in 2001), but factually 20,000 years of progress (again at the speed of 2001). It is interesting to note that later, Prof. Dr. Schmidhuber, a leading thinker in the field of artificial intelligence, asked whether this means that we would have smartphones with chips as complex as human brains by about 2030, and smartphones with chips as complex as all brains of mankind by about 2050. This is based on an extrapolation of the historical exponential development in available computing power.

You, as physical chemists – and particularly the younger ones among you – will find yourself standing right in the middle of this fascinating development. You won't just experience this fascinating development, but you'll actually be contributing to it! And you will need to help politics and society understand and digest this tremendous speed of change and what this exponential technological progress will mean for society.

Let's take a look at some examples. More and more countries around the world intend to move to renewable sources for power production, to set themselves aspirational targets and start legislation accordingly. As much as this is desirable, we should not forget that this is an effort of gigantic dimensions – and of gigantic costs, which will have massive impact on our lives. Thus, we collectively have a huge interest in structuring this effort in such a way that we get the biggest impact – in terms of CO₂ reduction – for as little as economic cost as possible. First, the challenge that we face needs to be described in terms of size and emitting sources. And second, the abatement costs need to be sorted by technology and, again, size. This debate cannot take place in a meaningful way without first having a solid understanding of the laws of thermodynamics and other physical principles. Scientists need to sit at the table and provide the necessary fact base, just as the virologists and epidemiologists have been doing during the Corona crisis.

Another example is artificial intelligence, and also quantum computing. The flip side of Kurzweil's law of accelerating returns is “Gate's law” (named after Bill Gates): The Gate's law states that the impact of technical progress usually gets overestimat-

ed in the short term and underestimated in the long term. Artificial intelligence and quantum computing might be excellent examples for that idea. In principle, these techniques – when combined with already existing modelling approaches – have the possibility to revolutionize chemistry. In the extreme – a very comforting thought for clumsy experimenters like myself – they may make the laboratory experiment in large parts redundant. For example, in silico approaches combined with artificial intelligence may soon be much faster and allow for much more experimentation than everything we know and do today. Think about what that would mean for your own work, if you had this computational power at your fingertips and readily available. The only remaining hurdle is the high cost of this computer speed that – again – will decline exponentially over the coming years (and not necessarily decades, either).

I personally find it highly exciting and highly rewarding to be part of this fascinating change. And I hope that you do as well – and that this Bunsen-Tagung allows you to enjoy not only the academic debate, but also the passion and the enthusiasm for scientific progress that all of us share.

Thank you very much and stay healthy!

Florian Budde

Florian Budde is the Chairman of the German Bunsen Society. He has been a management consultant with McKinsey & Company, Inc. for more than 30 years, for the last 20 years as a Senior Partner.



He established McKinsey's Global Chemicals Practice that he led for many years. Later, he was responsible for McKinsey Solutions, McKinsey's data and technology driven consulting services.

Before joining McKinsey, he worked in the department for fundamental research of IBM.

Florian holds a doctorate from FU Berlin (Fritz-Haber-Institut of the Max-Planck-Society, Prof. Dr. Gerhard Ertl).

Currently, Florian holds a number of board and advisory positions. His passion is the commercialization of science and technology.