

Dear TUM friends and associates,

2018 marks a very special anniversary for us here at TUM. 150 years ago, Ludwig II, King of Bavaria, founded our university. With gratitude, we remember all those people who have shaped TUM and enriched our society with their curiosity and inventive spirit over the years since 1868. What started out as a polytechnic school has grown into one of the world's top-ranking universities.

This anniversary finds our university in good spirits, evidenced by the fact that we can look to the future with optimism and confidence. As a leading research university, we have a key role to play in the quest for solutions to the major challenges of our time: Health & Nutrition · Energy & Natural Resources · Environment & Climate · Information & Communications · Mobility & Infrastructure.

In recent years, we have attracted numerous young scientists from all over the world to tackle these topical issues. Building on their excellent qualifications, they are ideally equipped to think outside the box and look beyond their individual disciplines – which is precisely the approach we foster at TUM. Our Integrative Research Centers, such as the Munich School of Engineering, bring together specialists from a variety of disciplines. Similarly, our TUM Institute for Advanced Study gives leading lights in their field the freedom to try out new ideas, knowing that they could inspire a breakthrough, but also that their endeavors may not be successful. After all, if there is no risk, there is no reward. The TUM Faculty Tenure Track career model offers talented young researchers realistic prospects for advancement to a permanent professorship.

From junior research group leader to tenured professor, many young and excellent scientists are now teaching and researching at TUM. We are delighted to introduce ten of them to our readers in this issue of our magazine.

Bjoern Menze conducts his research at the interface between computing and medicine, “teaching” computers to detect and classify brain tumor indicators based on hundreds of X-ray images. Also seeking new approaches through large-scale data analytics are Stefanie and Kilian Eyerich, whose focus lies on personalized treatment of chronic skin conditions.

Meanwhile, Xiaoxiang Zhu is investigating the impact of urbanization. She uses machine learning algorithms to analyze data from earth observation satellites and social media networks, taking this as the basis for high-precision 4D models of the world's cities. Remaining in the urban environment, Jia Chen is using a new method to track the volume and spatial distribution of greenhouse gas emissions in our cities.



Next, we step inside the laboratory of Stefanie Ranf, who discovered a receptor that is used by plants to sense pathogenic bacteria and combat these pathogens. We also watch Tim Czopka at work as he tracks the lifecycle of myelin-forming cells in the central nervous system in a bid to gain new insights into neuroplasticity.

In addition, this issue brings you new approaches to energy research: Christoph Hackl harnesses complex mathematics to develop new control technology for renewable energy systems. And Harald Oberhofer uses computer models able to analyze thousands of chemical compounds in a quest for organic semiconductors to enable the solar cells of the future.

Finally, Leibniz Prize winner Hendrik Dietz – a pioneer in the field of bionanotechnology – shares his thoughts on success factors for a career in research. In his view, productivity is key, as is a willingness to never stop learning. Indeed, his conviction that it's best to pick a topic that inspires you personally is a fitting summary of the interview as a whole – and something the young researchers featured in this issue have evidently all achieved. I trust you will agree that this makes for inspiring reading.

Wolfgang A. Herrmann

Prof. Wolfgang A. Herrmann